



# Fiscal Sustainability Under an Ageing Population Structure

New Zealand Treasury

BACKGROUND PAPER FOR THE  
2013 STATEMENT ON THE LONG-TERM FISCAL POSITION

JULY 2013



New Zealand Government

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FOR THE 2013  
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LONG-TERM FISCAL  
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Fiscal Sustainability Under an Ageing Population Structure

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# Abstract

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This paper focuses on the fiscal projections in the Treasury's 2013 Long-Term Fiscal Statement. It begins by illustrating the reason for long-term fiscal planning via a *Frozen Age* scenario. The rationale for focusing on a "*Spending path that maintains 20% Net Debt*" scenario, rather than the traditional "*Resume Historic Cost Growth*" projection, is discussed, including explanations of the roles both play in communicating the future fiscal challenges. The current status of both of these scenarios is examined, including discussion of projections of major expenditure and revenue classes under the "*Resume Historic Cost Growth*" scenario. Following this is a section illustrating and discussing the "cost of delay" in addressing the fiscal pressures produced by an ageing population structure. The impact of removing two years from the forecast base of the bottom-up expenditure projections is outlined, before the paper concludes with a brief look at the role that tax could play in stabilising the future fiscal position.

## JEL CLASSIFICATION

JEL classification codes:

H2 – Taxation, subsidies and revenue

H5 – National government expenditures and related policies

I00 – Health, education and welfare

J00 – Labour and demographic economics

## KEYWORDS

Key words: Public expenditure; taxation; labour market; demographic economics

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# Fiscal Sustainability under an Ageing Population Structure

## 1 Introduction

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This paper is part of a series of background papers that accompany the 2013 Statement on the Long-Term Fiscal (LTF) Position.

The main foci of this paper are to:

- illustrate why an ageing population structure requires fiscal planning to be done over a longer time horizon than is normally considered;
- explain why we are emphasising a different approach to fiscal projections compared to that of past LTF Statements;
- outline the current state of our fiscal and economic projections, including discussing the impact of, and reasons for, starting bottom-up projections of Operating Allowance-controlled expenditure classes two years before the end of the forecast base; and
- explore some fiscal projection scenarios involving the cost of delay in addressing fiscal pressures that arise from an older population structure.

There are six sections to this paper, following this *Introduction* section. They are:

- 1 Demonstration of the major reason why there is a need for long-term fiscal planning via a portrayal and discussion of a theoretical *Frozen Age Structure* NZ. This assists in pinpointing the areas in which our changing demographic age structure is causing pressures on demand for publicly-funded goods and services, plus potentially reducing economic growth and hence the tax revenue that arises from it.
- 2 Examination of why the 2013 LTF Statement, as well as illustrating and explaining the “*Resume Historic Cost Growth*” scenario - variations of which have featured prominently in the past two LTF Statements - devotes considerable space to an alternative “*Spending path that maintains 20% Net Debt*” scenario.

Debt is the residual of “*Resume Historic Cost Growth*” modelling. In general, no policy changes are assumed in projected years, especially in regard to expenditure or revenue settings. As a result, when ongoing deficits arise they are not addressed, leading to debt curves rapidly accelerating as debt-financing costs grow.

Core Crown Net Debt, which is gross debt less a defined set of financial assets, is stabilised as a percentage of nominal GDP<sup>1</sup> over the long-term, under “*Spending path that maintains 20% Net Debt*” modelling. Annual amounts available for new “spending” are the model’s residual. The term spending should not be taken too literally, as new funding can be used to lower taxes as well as lift expenditure.

- 3 Discussion of the projections of key fiscal variables, under both “*Resume Historic Cost Growth*” and “*Spending path that maintains 20% Net Debt*” modelling. These projections use the 2013 Budget Economic and Fiscal Update (EFU) forecasts as their base.
- 4 Examination of the “cost” of delay in addressing the fiscal pressures caused by an older population structure. This is illustrated via scenarios where fiscal consolidation, to achieve stable and ongoing low net debt to GDP, is delayed until increasingly distant future years. Comparisons of the size and duration of average operating surpluses needed from each start year provide a metric for the “cost” of delay.
- 5 Demonstration of the impact of removing two years from the end of the forecast base for expense projections. This helps to display the sensitivity of the projections to their base, and reinforces the message of early, gradual change.
- 6 Discussion of the role that tax could play in the future fiscal position. This includes information on NZ’s tax-to-GDP ratio in recent decades and a discussion around the impacts that need to be taken into consideration in raising taxes.

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<sup>1</sup> Economists often use the term GDP, or Gross Domestic Product, to mean Real GDP, a volume measure of economic activity in constant prices. However Nominal GDP, a current price measure, is used more frequently in LTF work. It is both a growth driver in projecting variables, like tax revenue, and the denominator of key fiscal indicators, such as Net Debt to GDP. Unless defined otherwise, any reference to GDP in this paper should be taken to mean nominal GDP.

## 2 Frozen age structure – a theoretical experiment

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### 2.1 The need for long-term fiscal planning

Before delving into various long-term fiscal and economic projections and scenarios, a logical question to ask is “*Why are these done?*” If this question seems facile, in the sense that the government of any responsible nation should plan for the future, it is more the long-term aspect of the planning that is being queried, rather than the planning itself.

The NZ government publishes a Budget each May, including 5-year forecasts of revenue and expenses and descriptions of plans and policies in areas such as welfare, health, education, tax, etc. The Fiscal Strategy Report (FSR) that is published with the Budget includes post-forecast projections, for a further decade, of the potential paths of key fiscal indicators, like core Crown Net Debt and the Operating Balance, under current or planned policy settings.

With this degree of budgeting and planning, and given that the decade-long projections of the FSR have sufficed until recently, why does the Treasury now publish LTF Statements as well? Putting aside questions around the validity of projecting over 40 to 50 years, what has changed to necessitate an even longer-term focus than that of the FSR nowadays?

The answer lies in the one long-term projection for which there is the least doubt, namely demographics, or more specifically, **NZ’s ageing population structure**.

### 2.2 Projections versus forecasts

Before expanding on this, the difference between **projections** and **forecasts** need to be spelled out. It is projections that are largely the concern of this paper, not the forecasts from which they arise. The two terms are sometimes mixed up, especially by the media, but they are quite different and should not be confused.

- Forecasts are based on comprehensive modelling of economic and fiscal conditions, including the relationships between the two and the impacts of existing or proposed policies. Based on the information available, they represent the **best attempt to predict future outcomes**.
- Projections are **potential paths** of economic and fiscal variables beyond their forecast base, largely based on historical averages of the levels or growth rates of these variables. They are **highly dependent** on both their forecast base and the assumptions applied to generate them. A feature of the LTF economic projections is that they move towards, and then maintain, an assumption of a cycle-free economy that is growing on trend. This rarely actually occurs, especially over extended periods.

Projections, be they of economic, fiscal or demographic variables, cannot hope to accurately portray the future. Furthermore their accuracy generally diminishes even more the further out in time they go. They are intended not as an accurate forecast, but more as an indication, or in some cases even a warning, of the potential outcomes of a particular set of assumptions. They are set in a future that will involve an almost limitless array of economic, political, technological and societal change that cannot be predicted.

Hence, while it is acknowledged that the population projections of Statistics NZ will not be accurate forecasts, they should be more reliable than economic or fiscal outturns. This is because the trends in demography are more predictable, especially for fertility, and much of the population present in these projections, especially in the first 30 years, are alive now.

This, in turn, means that while the exact size and make up of NZ's population in future years is uncertain, it is extremely likely that:

- the population's age structure will change to much larger ratios in older age groups; and
- this ageing of the population, while it will eventually slow, will not reverse.

## 2.3 Demographic trends

Another Treasury background paper for the 2013 LTF Statement is *Long-term Fiscal Projections: Reassessing assumptions, Testing new perspectives*. This paper examines the assumptions around the major contributors to demographic projections, namely fertility, mortality and net migration. Hence it is enough to state two basic trends here that mean that our population structure will continue to age across these projections.

Fertility, as measured by live births per woman, rose and fell in NZ in different periods of the last century. However from the early 1960s onwards it consistently fell, from a peak of over 4 births per woman to around 2 by the start of the 1980s. There have been small dips and rises since, but nothing of any great significance. This level of births per woman is around the replacement rate for a population without having to rely on net migration. The important point to appreciate here, in regard to our future population, is that this relatively low fertility rate has persisted for 30 years and nothing suggests it is likely to lift again. Access to reliable contraception, higher female labour force participation, more female tertiary education students than males, and changing societal expectations around women's roles are all factors that lean towards reducing fertility, rather than an upward movement.

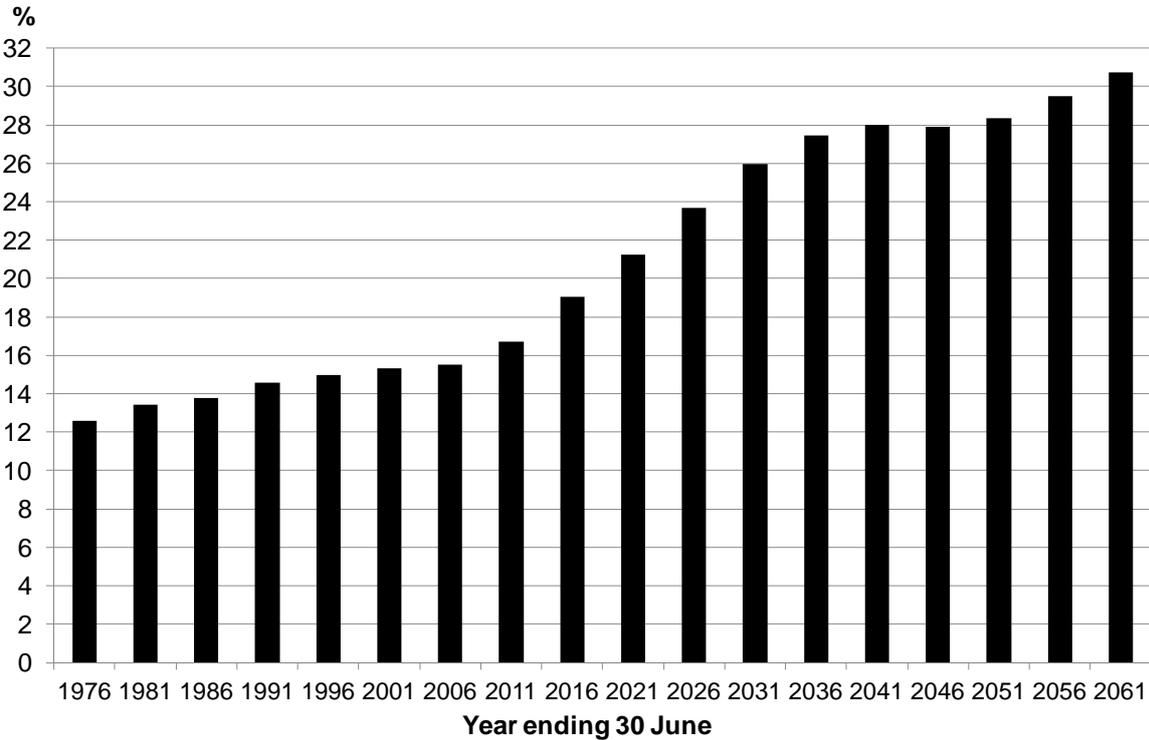
Mortality deals with the other end of the age scale. As is the case for many advanced economies, life expectancy has been increasing markedly for both men and women in NZ over much of the last century and especially over the last 50 years. As an example, the average life expectancy for males has increased by around 12 years since 1960. Trends in mortality, in regard to whether the rates of extension of life expectancy will continue to increase or slow somewhat, are less predictable than the flat fertility rate. However, few demographers believe they will decline. There are many reasons for these improvements, including medical advances, reduced rates of smoking, and better diets (although some might debate that last one). Living longer is something to be celebrated, but it does mean that, in combination with reduced fertility, our population structure will change.

Furthermore, and this is a key message of the LTF Statements that is not widely appreciated among the general population, **this is a permanent change**. There is a wide-spread belief that it is a "baby boomer problem" and, while it may take 30 years or more for that generation to move through the population structure, it is nevertheless a temporary change. That is wrong. The baby boomers add to the fiscal pressures of ageing, but they are not the root cause. Rather the change in the population structure is permanent, due to a combination of a lower proportion of younger people than in the past, ie, reduced fertility, and people living longer than they used to do, ie, reduced mortality.

Figure 1 illustrates the older age dependency ratio in NZ's recent, present and projected population. This is defined as the percentage of the Working-age Population (WAP) aged 65 or above. The WAP is sometimes defined as the age group "15 years to 64 years old", but in this paper it is intended to mean all individuals in the population aged 15 or more ie, the potential labour force.

Dependency can be an emotive term. A couple in their seventies, living in and maintaining their own home, dealing with their own finances, managing their household budget etc probably do not consider themselves dependent on anyone. However, if they are receiving New Zealand Superannuation (NZS), which is funded from taxation, then this part of their income is not of their own making. In that regard, the term is applicable to this age ratio.

**Figure 1:** Percentage of working-age population (those aged 15 or more) who are at least 65 years old – history and projection



Three points stand out from the graph, which are:

- 1 The dependency ratio is projected to rise from just over 12% in the mid-1970s, or one NZS recipient to every 7 younger potential workers, to over 30% by 2060/61, or a ratio of around four pensioners to every 9 younger adults.
- 2 From 1976 to 2006 the dependency ratio lifted quite slowly, but the increase over the next ten years to 2016 will surpass that over the previous 30 years. After that it accelerates again so that, by 2036, the average growth rate over this 20-year period is close to twice that over the previous 40 years.
- 3 Beyond 2036 the dependency ratio grows fairly slowly again, but it does not decrease. This emphasises the permanent nature of NZ's population ageing

If it is accepted that there is a very strong likelihood that NZ's population structure will become significantly older over the next half century, how does that translate through to an increased need for fiscal planning?

There are a number of channels via which an older population structure will impact the fiscal position. One obvious area of increased spending, assuming no policy change, is the public pension, NZS, due to significant growth in its recipient group. While the demographic link is not as direct as for NZS, Health spending tends to be skewed towards older age groups. Hence this is a major spending area that will likely lift relative to GDP as the population ages. Yet another example of change is in the labour force, where the participation rates of both males and females 65 years or older are generally lower than those of younger age groups. As a consequence, and again assuming no policy changes that might boost older age group labour force participation beyond its current assumed trend, labour force growth may well slow with an ageing population structure, meaning economic growth will do the same. As tax revenue tends to grow in line with the economy, this could see relatively less tax dollars available to fund some of the increased spending pressures.

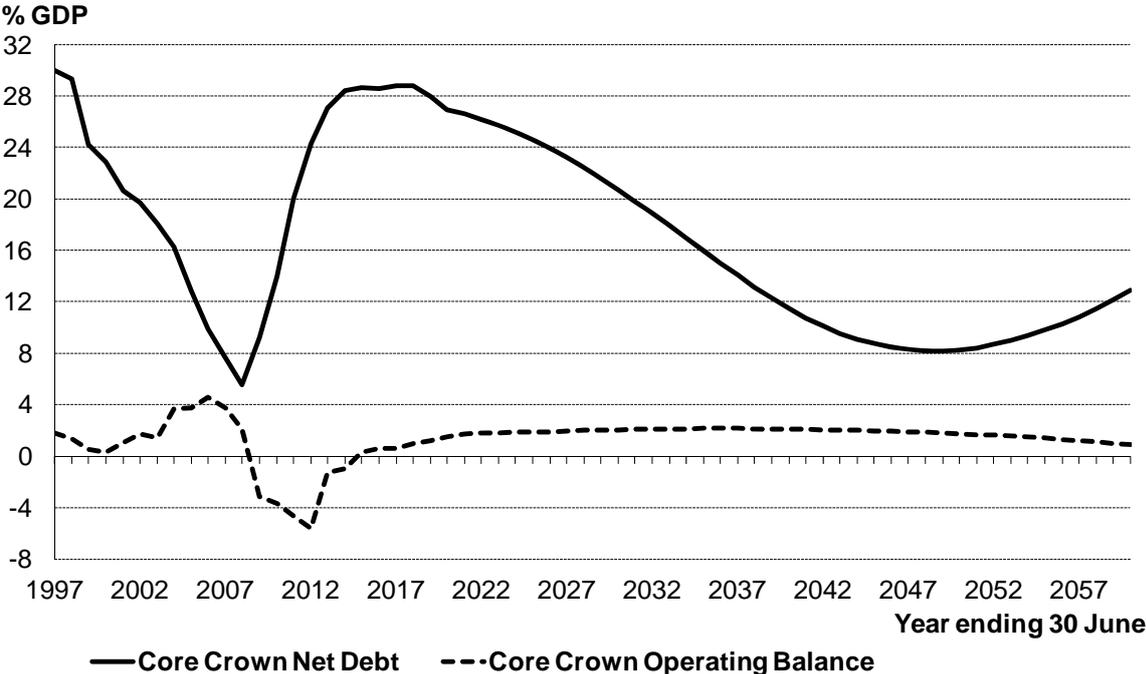
### 2.4 Frozen Age Structure experiment

The final part of this section brings all that it has discussed so far together, via a theoretical *Frozen Age Structure* scenario. This illustrates that, if NZ’s age structure stayed as it is, fiscal pressures would be no more than normal over the next two or three decades, meaning current expenditure and tax policy settings could be maintained for many years to come.

Population growth in this *Frozen Age Structure* scenario is identical to that for the normal projections but the age proportions do not change from their expected distribution in 2014/15, the final year of the Budget 2013 forecast before bottom-up expense projections are applied in the “Resume Historic Cost Growth” scenario. As an example, the “25 to 40 years” age group is expected to comprise 20.8% of the population in 2014/15. That percentage is projected to fall by nearly one and a half percentage points to 19.4% by 2059/60. Under the *Frozen Age Structure* scenario this age group stays at 20.8% as the population grows.

Figure 2 depicts the projected core Crown Net Debt and Operating Balance projected tracks under this *Frozen Age Structure* scenario. Exactly the same policy settings are assumed as in the “Resume Historic Cost Growth” scenarios that will be shown later in this paper.

**Figure 2:** Core Crown net debt and operating balance to GDP – Frozen Age Structure (at 2014/15 proportions) scenario



The lift in the Net Debt curve from around 2050 and the slight reduction in the Operating Balance track that begins around the same time indicate that, even in this theoretical world, current fiscal policy settings eventually become unstable and some changes will be needed.

However, there is no rise in the core Crown Net Debt to GDP track for nearly 40 years. As such, if these were truly the projections under a “Resume Historic Cost Growth” type of scenario, they would not represent a compelling case for long-term fiscal planning. Current tax and expense settings see the Net Debt to GDP track continue to fall for many years, and much will change anyway before the distant future years where the debt track starts to rise again.

Three factors in particular lead to the relatively benign Net Debt and Operating Balance projections under the *Frozen Age Structure* scenario. These are:

- 1 Without the growth of the “65 and above” age group greatly outstripping that of the labour force, NZS to GDP does not rise over the projections in this scenario. In fact, by 2059/60 it is a slightly lower ratio to GDP than it is in 2014/15. The projection that uses the normal population projections has NZS to GDP lifting by 3 percentage points of GDP over the same time period, or 63% higher in 2060 than it is in 2014/15.
- 2 Health spending still rises relative to GDP under *Frozen Age Structure*, but the increase over the period 2014/15 to 2059/60 is less than 3 percentage points of GDP. This compares to lift of 4½ percentage points of GDP over this period when the normal population projections are assumed. A rise still occurs because all age groups receive publicly-funded health services and total population growth is no different under the *Frozen Age Structure* scenario. However, Health spending is more heavily skewed towards older age groups so, just as with NZS, when these older age groups grow no more strongly than any others, Health expenditure does not rise by nearly as much.
- 3 With proportionally more younger people in the population, whose labour force participation is generally higher than that of people aged 65 or more, labour force growth itself is stronger. This flows through to higher GDP growth over the projected years. As tax revenue is projected to grow in line with nominal GDP, there are more tax dollars to offset expenses under the *Frozen Age Structure* scenario.

As the saying goes, “there are no free lunches”, and *Frozen Age Structure* does not lead to expenditure savings in all categories. Education and Law and Order demonstrate various degrees of a “demographic dividend” under normal population projections, ie, their recipient groups grow more slowly than the demographic driver of GDP, meaning their ratios to GDP decline (albeit fairly modestly in both cases) across the projected years. Both of these areas rise relative to GDP under *Frozen Age Structure*. That is because their younger recipient groups (if that is the right term for Law and Order) undergo stronger growth in this scenario. However these areas of higher costs are not enough to offset the gains in the Operating Balance track, relative to those which apply under the normal population projections.

Unfortunately, *Frozen Age Structure* is a theoretical concept only. It is virtually impossible to conceive of any circumstances by which this could actually occur. The reality is that, as has been discussed, the ageing population structure that is incorporated in the normal population projections is probably the most reliable feature of the long-term projections.

Given that, there is a need to plan for the permanent change in our population age structure that will evolve over the next few decades. This demographic phenomenon is not a negative thing. How can the fact that we are living longer, healthier lives than our parents did, and that our children are likely to see this longevity improvement continue, be a bad outcome?

The media has begun to use a catch phrase, the “silver tsunami”, to describe population ageing. This is a poor metaphor, as a tsunami is a sudden, catastrophic event that wreaks devastation with little forewarning. By contrast, we know our population is ageing; we have a number of years in which to prepare for it; it will bring some changes that we can use to our advantage; and others whose negative aspects we can adapt to and mitigate.

It is the need to inform politicians, policy makers, businesses, employers and, most of all, the public, about the population changes that are coming and the options that they have to deal with them, that is the major rationale for the Treasury producing LTF Statements.

# 3 Long Term Fiscal through a lens of constraining debt

## 3.1 Past and present LTF projections

Past LTF Statements have focused mainly on a projection technique that they have labelled *Bottom-up* (2006) or *Historic Trends* (2009). The current label is “*Resume Historic Cost Growth*” but the name matters far less than its underlying main feature, which is that it makes **government (or public) gross debt the residual of the modelling**. In particular, as an ageing population pushes total expenses above revenue settings, no policy response to ongoing deficits is modelled. Shortfalls are assumed to be borrowed. Deficits grow rapidly as finance costs balloon with increasing debt, often to a point where the issues faced appear insurmountable.

**Figure 3:** Core Crown net debt to GDP – Past & present LTF projections

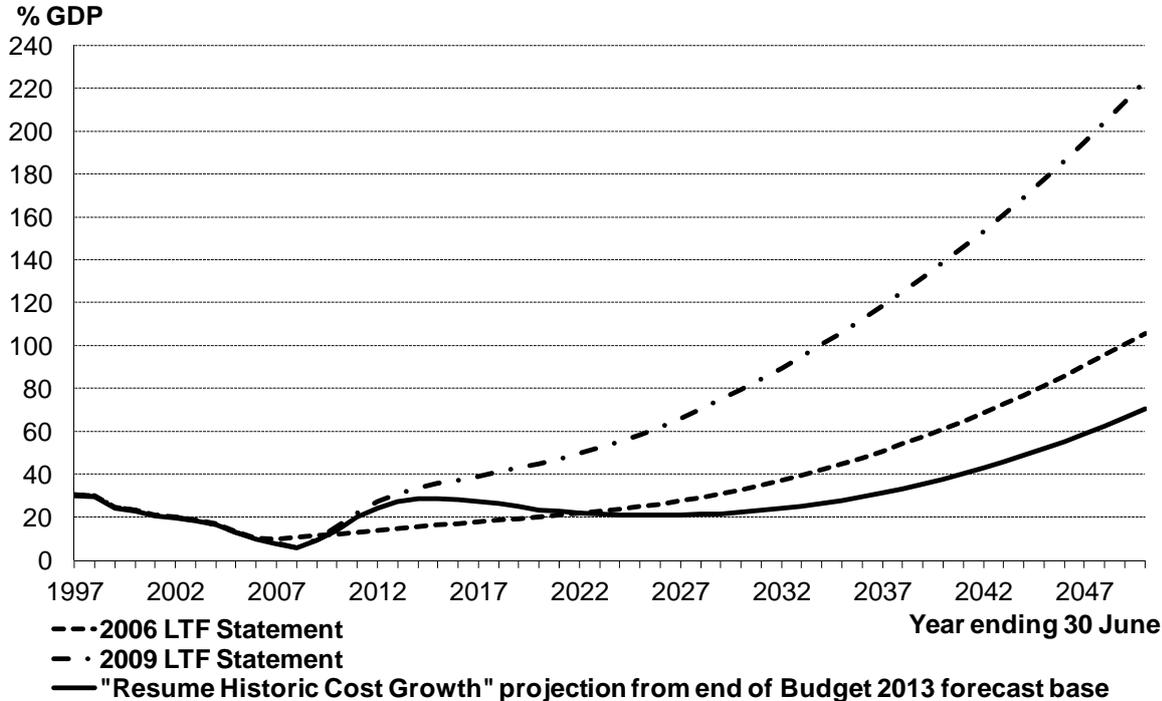


Figure 3 shows these bottom-up, “debt as residual” projections, as they appeared in the previous two LTF Statements and also the latest “*Resume Historic Cost Growth*” projection if the entire 2013 Budget EFU forecast base is assumed to hold before beginning projections.

A number of points arise from this graph, and many of them relate to the reasons for a stronger emphasis in the 2013 LTF Statement on the alternative “*Spending path that maintains 20% Net Debt*” scenario. The latter is not a new idea. It appeared in both the 2006 and 2009 Statements, in various guises. However, in those Statements it was viewed more as “one of a number of alternative scenarios”, with a “*Resume Historic Cost Growth*” type projection being front and centre as the main scenario that was discussed and analysed.

### 3.2 The positive aspects of “Resume Historic Cost Growth”-type projections

The bottom-up, “Resume Historic Cost Growth” scenario is still a major feature of the 2013 LTF Statement. This is because it has some very important roles to play, especially in three main regards. These are:

- **Serving as a warning signal** that current expenditure and/or revenue settings will become unsustainable at some point in the future. While the level of debt to GDP reached by some arbitrary future year - in the graph above that is 2049/50, simply because that is where the 2006 & 2009 LTF Statement projections ended - may differ markedly from projection to projection, all three curves displayed eventually bend upwards. The shape of the curve is the true message, as an upward-turning debt curve is a clear signal that changes to fiscal settings are needed to restore balance.
- **Illustrating some of the key messages** of LTF Statements, such as that **early, gradual change** is preferable to leaving things until quite drastic (and, if the recent economic situation in Greece is anything to go by, probably unpalatable) reform is needed. A good deal of the improvement between the 2009 projection and the latest one is due to changes that have reduced the cost of some large-scale policies, such as KiwiSaver, as well as across-the-board reductions via “net zero” Budgets.
- **Acting as a counterfactual** to the “*Spending path that maintains 20% Net Debt*” scenario. While it is difficult to quantify, with any degree of accuracy, the level of change needed in particular areas, it still helps to know where the main “pressure” areas are. For example, a “Resume Historic Cost Growth” track can indicate that an ageing population structure will put greater demand in an area like Health than it will in Education. Hence finding ways to “bridge the gap” between the two scenarios is likely to put more emphasis for options in Health than in Education. It may also suggest that future Budgets will need to allocate new funding differently to how they have in the past.

### 3.3 The negative aspects of “Resume Historic Cost Growth”-type projections

Returning to the graph of the previous two LTF Statement “Resume Historic Cost Growth” projections, and the current one, what are the main reasons for taking some of the emphasis off this approach via balancing it more with a scenario where debt does not “explode”?

First, and arguably foremost, they are too easily dismissed as **unrealistic**. Two aspects of the “Resume Historic Cost Growth” type of projection in particular have led to their being criticised and dismissed. This has diminished their effectiveness in communicating the LTF messages.

- 1 These projections often display public debt rising to levels that have not been observed in New Zealand’s history; and
- 2 They can vary significantly, with each update of projections, in terms of the level of debt reached at some arbitrary future point.

To some degree, both of these “problems” arise from the “Resume Historic Cost Growth” projections being exactly that ie, **projections**, not forecasts. As was explained earlier, these two concepts are quite different. Projections should be viewed as signals, not an accurate view of the future.

So if the projections are only intended to represent potential paths for variables, including Net Debt, what is wrong with that potential path ballooning out to values never seen in history? The projection is not a forecast, so it is not purported to represent a likely future outcome.

Nothing is wrong, as long as the projection is understood to simply represent a **warning signal**. The projection serves its purpose if it is clear that all that it indicates is that the assumptions and policy settings underlying it are not fiscally sustainable over the long term. However, either due to genuine misunderstanding or because it suits the purposes of the commentator, the bottom-up “*Resume Historic Cost Growth*” type projections of previous LTF Statements have been dismissed as unrealistic by politicians, journalists and economists. “*Of course debt would never be allowed to rise to such levels*” is a typical response.

That then becomes a rationale for ignoring the projections, and the important discussions about how this kind of debt track will be avoided does not occur. The fundamental purpose of the LTF Statements is to promote debate about how future fiscal challenges will be addressed, not to provide excuses to ignore those challenges.

Another problem with the “*Resume Historic Cost Growth*” type projections is that the **degree by which they change** each time they are updated detracts from their credibility too. Beyond politicians, media, economists etc the main target of the LTF Statements is the NZ public. Ultimately New Zealanders need to decide what matters most to them, what they are willing to forgo, what they will pay more for etc in order to balance the public books. It is neither reasonable nor practical to expect everybody to delve into the detail of the projections in order to understand why they change so much. But, without that level of comprehension, it is also to be expected that the projections might be regarded as “*not worth the paper they are written on*” when the 2049/50 level of Net Debt to GDP more than doubles between the 2006 and 2009 Statements, and then reduces back to only two-thirds of the 2006 Statement’s levels in the latest projections.

To a large degree the change in the Net Debt to GDP ratio in these projections, by the common end point of 2049/50, is simply a product of the amount of time between the onset of ongoing deficits and this end point. In the 2009 LTF Statement, produced at a time of huge uncertainty about the potential impacts of the global financial crisis (GFC) and without the amount of fiscal consolidation contained in later forecast bases, projected operating surpluses were never achieved. Debt-financing costs grew over both forecast and projected years, accounting for over a quarter of all core Crown spending by 2049/50 and making them the largest expense category by this time. By contrast the Budget 2013 EFU projection is in surplus by the end of the forecast years and does not slip into ongoing deficits until the early 2030s. Deficits have half the number of years to drive up debt relative to the 2009 projection.

The accelerating nature of debt growth under ongoing deficits also adds to the seeming volatile nature of “*Resume Historic Cost Growth*” projections too. Comparisons above use the 2049/50 endpoint of the 2006 and 2009 Statements. However legislation requires a 40-year horizon from the last actual or historic year, so the 2013 Statement needs to extend at least as far as 2051/52, and will actually go out to 2059/60. By that year the 70% ratio to GDP, reached in 2049/50 by the Budget 2013 “*Resume Historic Cost Growth*” Net Debt track, increases to 124%!

Finally, the potentially **sensational nature** of “*Resume Historic Cost Growth*” projections can detract from the main messages intended to be conveyed. The national newspapers took the projections of the 2009 Statement far too literally and wrote articles about public debt reaching a trillion dollars. Apart from the questionable wisdom of quoting nominal dollar amounts 40 years into the future, this may have done some good if it shocked people into appreciating the need for policy change. But if it made them view the relative certainty of the

changing age structure as an insurmountable problem, rather than something that we have time to adapt to and extract positive outcomes from, then the communication was the exact opposite to that intended.

### 3.4 Advantages of the “*Spending path that maintains 20% Net Debt*” approach

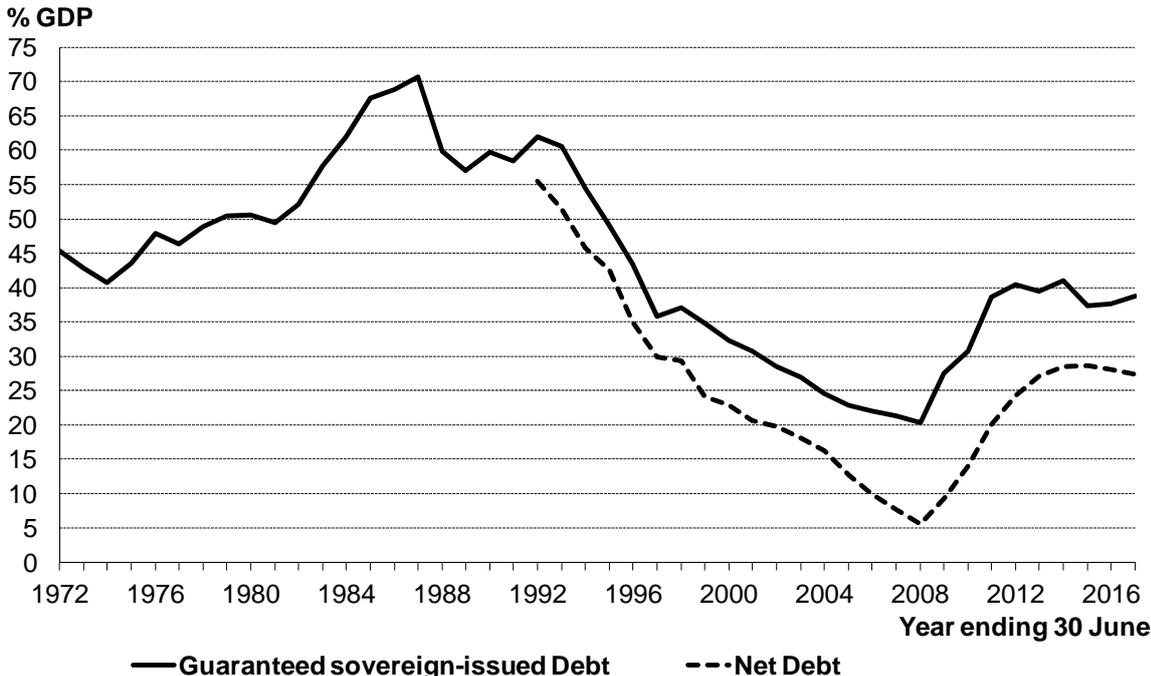
If those are the main problems with “*Resume Historic Cost Growth*” type projections, how will increasing the emphasis on an alternative kind of projection, the “*Spending path that maintains 20% Net Debt*” type, help? It is still just a projection, and as such it will not accurately portray the future, although it will at least be more aligned to history than the spiralling-out-of-control debt projections of the “*Resume Historic Cost Growth*” approach. Just as for the “*Resume Historic Cost Growth*” projection it will cover a future period that will involve unpredictable:

- advents, sizes and durations of several economic upturns and downturns;
- natural and political events, as well as changes in society’s preferences and tastes;
- technological innovation etc.

The strength of the “*Spending path that maintains 20% Net Debt*” approach is that it can mitigate, if not totally alleviate, all of the major communication problems identified above with the “*Resume Historic Cost Growth*” projection.

Figure 4 shows the history of core Crown Gross sovereign-issued debt (GSID) over the last 40 years, and core Crown Net Debt over the last 20 years. The Budget 2013 forecasts of both are included too. While core Crown Net Debt, as a ratio of GDP, is the focus of public fiscal objectives nowadays, the accountancy regimes and rules around its construction mean a backdated series is only available back to 1992. It should also be realised that the GSID series spans periods of cash and accrual measures.

**Figure 4:** Core Crown gross sovereign-issued debt and net debt to GDP – History and Budget 2013 forecasts



Despite some measurement differences over time, the overall picture is evident. NZ's fiscal history, especially over the last 25 years, has mainly been one of reducing the ratio of public debt to GDP. The advent of the GFC, plus the impacts of the Canterbury earthquakes, has caused debt levels to rise in recent years. However, adding the Budget 2013 forecast years to the graph shows a strong focus of current fiscal policy on reversing this lift too.

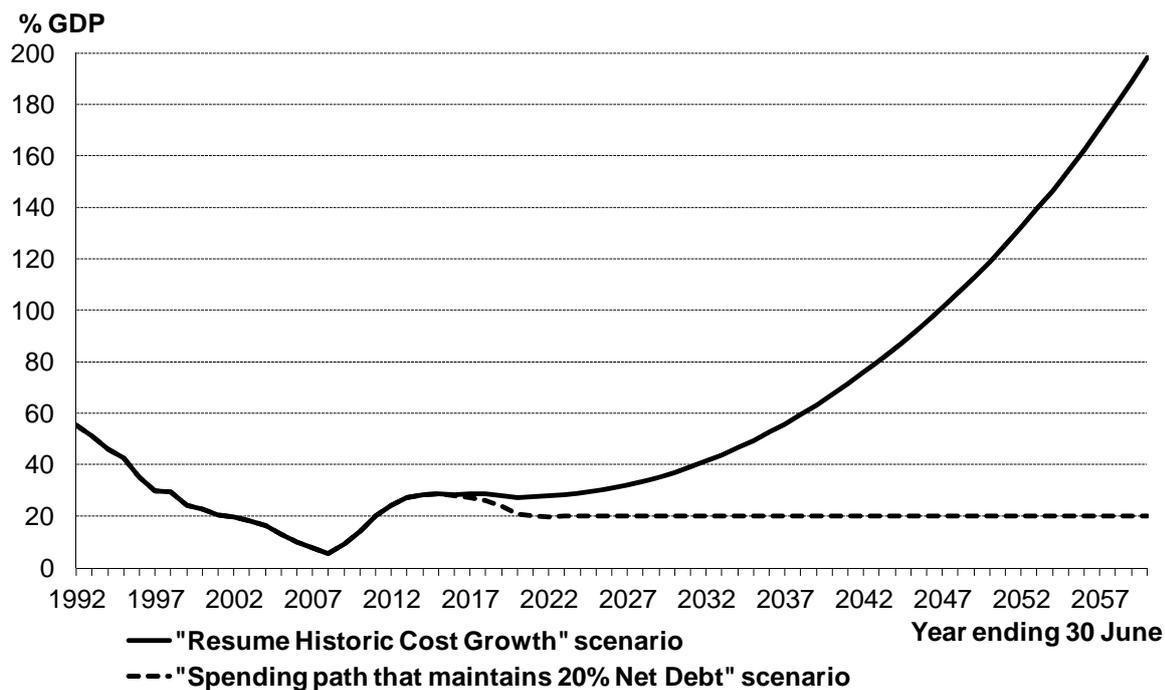
The working assumption used in this paper for the ratio of Net Debt to GDP targeted in the “*Spending path that maintains 20% Net Debt*” scenario is 20%. There is no preference or perception of optimality about a 20% Net Debt to nominal GDP ratio. In fact it is more the absence of a stated preference that has led to its use. The 20% ratio is simply a reflection of the current fiscal objective, as stated in the 2013 Fiscal Strategy Report, to ensure that “*Net Debt remains consistently below 35% of GDP, and is then brought back to a level no higher than 20% of GDP by 2020*”. It is also in line with the goals of the previous Labour-led coalition.

Furthermore, while the path to achieve a certain ratio of Net Debt to GDP is dependent on that ratio, maintaining it beyond that is more a function of the revenue and expenditure settings in those years. In a projection, where hard-to-predict real world impacts on debt like revaluations are not modelled, operating deficits are the chief cause of rising debt. If expenses and revenue largely match, deficits are avoided and debt does not increase.

While politicians, media and the public can debate the best ways to achieve a relatively low and stable level of public debt in a future where the population's age structure is quite different – which is precisely what the LTF Statements are intended to achieve – they will not be able to dismiss the “*Spending path that maintains 20% Net Debt*” projections as “unrealistic”. As the graph above illustrates, successive NZ governments from both sides of the political divide have strived to achieve such outcomes in history, are doing so now (especially after the impacts of the GFC) and are very likely to continue to do so in the future. And a focus on the need for decision making around expense and tax settings, in order to “live within our means”, may inspire the media more towards stories that promote debate around these future choices and trade-offs.

Figure 5 depicts the current “*Resume Historic Cost Growth*” and “*Spending path that maintains 20% Net Debt*” core Crown Net Debt to GDP tracks. As explained in more detail later in this paper, the main “*Resume Historic Cost Growth*” projection does not assume the entire Budget 2013 expenditure forecast base. Instead it begins bottom-up projections, for non-welfare, non-debt-financing costs expense classes that would normally derive their growth over the forecast years from a share of the Operating Allowance, **two years earlier than forecast end**. This is the technique behind any tracks, labelled as using “*Resume Historic Cost Growth*” projection logic, shown in this paper from here onwards.

**Figure 5:** Core Crown net debt to GDP – Two scenarios from a Budget 2013 base



It

is the replacement of “top-down” Operating Allowance-controlled growth by “bottom-up” individual expenditure class growth drivers in these final two forecast years that causes the “Resume Historic Cost Growth” track shown here to differ from the one in the *Core Crown Net Debt to GDP – Past & Present LTF projections* graph depicted earlier. The latter projected from the end of the forecast base, which made for better comparison with the past LTF Statement bottom-up projections depicted, as they used the entire forecast base.

It is obvious that another problem of the “Resume Historic Cost Growth” projections, namely potentially large changes in the debt projections from update to update, is not shared by a “Spending path that maintains 20% Net Debt” approach. While this is true for debt, as it is literally being capped under this projection logic, it may not translate to expense and/or revenue projections. For example, if tax settings remain unchanged, it is possible that overall expense levels have to be pushed lower than they have been in history to achieve a constant Net Debt to GDP ratio. This makes it important to provide a balanced picture via illustrating projections of both expenses and revenue. While acknowledging this, the potential for large changes in expenditure or revenue tracks is mitigated by the fact that they are measures of flow, while debt is a stock measure.

In summary, emphasising the “Spending path that maintains 20% Net Debt” projection to a similar degree as the “Resume Historic Cost Growth” projection in the 2013 LTF Statement could:

- align one of the central projections with both present and historical fiscal strategy;
- prevent the main messages of the Statements being lost because the modelling is dismissed as unrealistic or alarmist; and
- help set the scene for discussions, in the areas dedicated to pensions, health, tax etc, of options for living within the constraints that our changing age structure entails.

## 4 The current projections

### 4.1 The widening gap between “Resume Historic Cost Growth” and “Spending path that maintains 20% Net Debt” operating balance projections

As has been referred to earlier, *Long-term Fiscal Projections: Reassessing assumptions, Testing new perspectives* is another background paper to the 2013 LTF Statement. It provides detailed explanations of the bottom-up projection techniques applied to various expenditure categories, as well as how tax and other revenue types are projected in the LTF modelling.

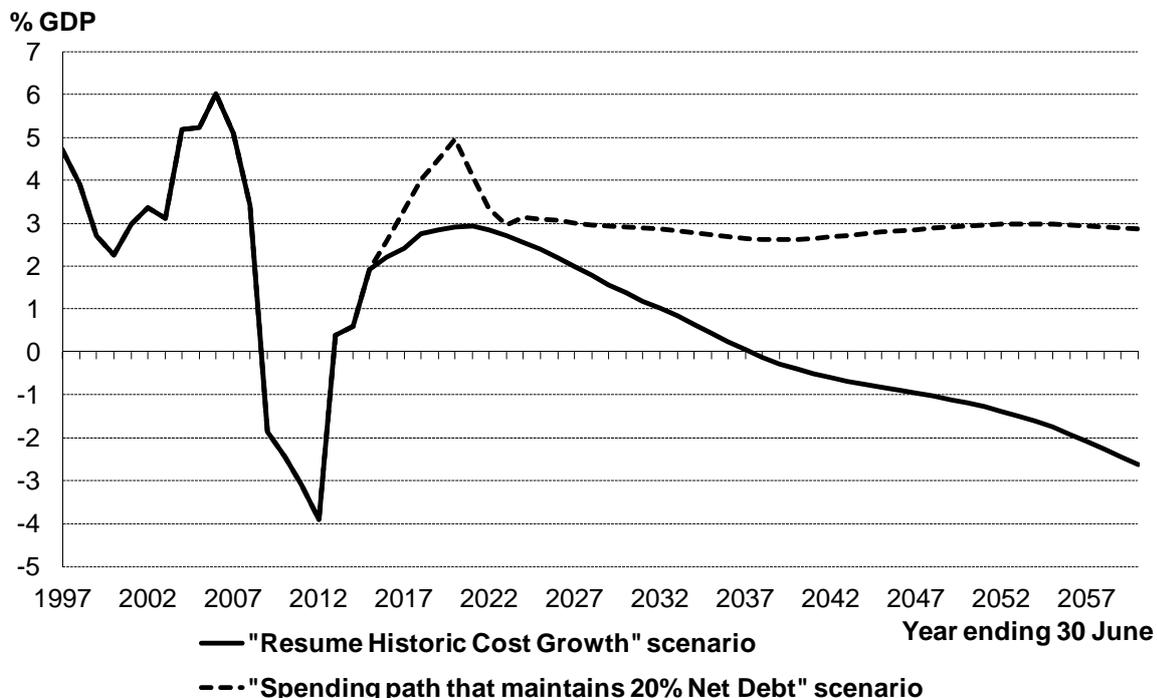
The current core Crown Net Debt to GDP projections, under both “Resume Historic Cost Growth” and “Spending path that maintains 20% Net Debt” scenarios, are illustrated in the graph on the previous page. They are largely a product of the tax and expenditure assumptions in the scenario, or more correctly the gap between aggregate revenue and aggregate expenses that these produce.

Under the International Financial Reporting Standards (IFRS) accountancy system used by the NZ Government in its fiscal reporting, the Operating Balance is defined as:

$$\text{Revenue (excluding gains)} - \text{Expenses (excl. losses)} + \text{Unrealised Gains/(losses)}$$

Figure 6 illustrates, for the “Resume Historic Cost Growth” and “Spending path that maintains 20% Net Debt” scenarios, the core Crown Operating Balance excluding debt-financing costs<sup>2</sup> (abbreviated as DFC henceforth).

**Figure 6:** Core Crown operating balance excluding debt-financing costs to GDP – Two scenarios from a Budget 2013 base



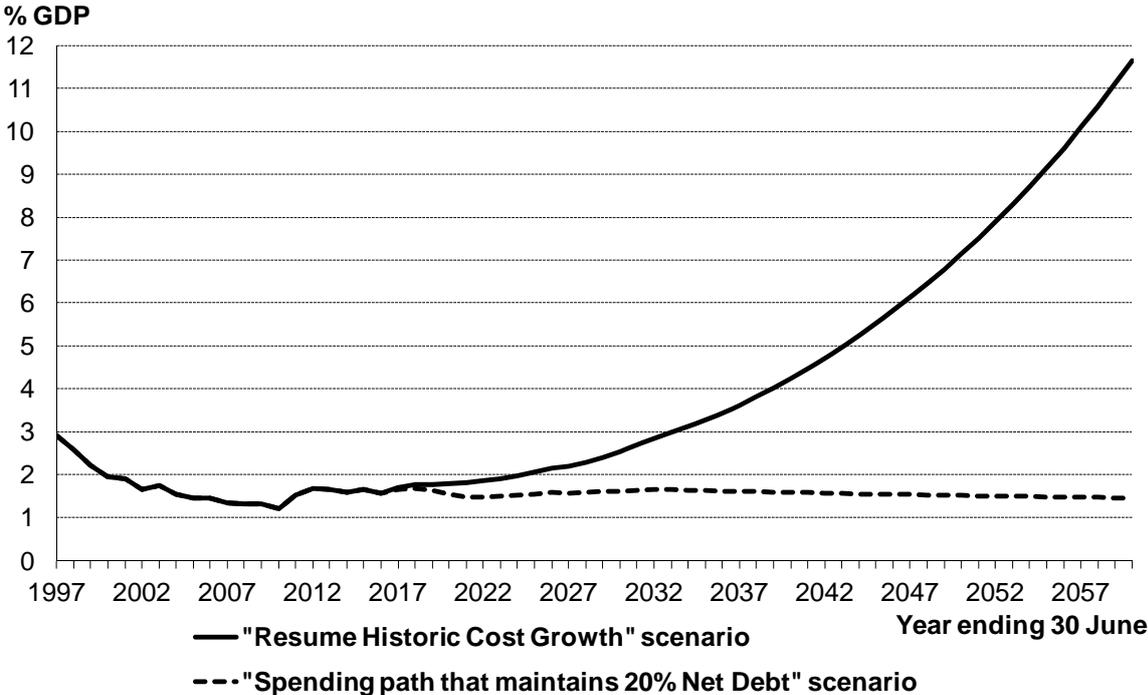
<sup>2</sup> Some would describe this measure as the Primary Balance, but generally that measure involves not just excluding debt-financing costs from expenses, but also interest income from revenue.

The projected dashed line, which represents the core Crown Operating Balance excluding DFC to GDP for the “*Spending path that maintains 20% Net Debt*” scenario, is more aligned to history than the projected solid line, which represents the same measure for the “*Resume Historic Cost Growth*” scenario. Not surprisingly, given the relationship between the Operating Balance and debt, this is the same outcome that was purported earlier in regard to Net Debt. The only period in recent history where this surplus/deficit measure goes negative is after the onset of the GFC in the fiscal year 2008/09. Fiscal consolidation in order to address this is built into the Budget 2013 forecast base, meaning the Operating Balance excluding DFC returns to positive by 2012/13.

From the perspective of communicating the challenges and choices facing NZ over the next half century, the “gap to close” appears less daunting than when it is illustrated via net debt. Between when they first part company, which is two years before the end of the Budget 2013 forecast ie, the fiscal year 2015/16, and the projection endpoint of 2059/60, the average gap between the “*Resume Historic Cost Growth*” and “*Spending path that maintains 20% Net Debt*” tracks is 2.8 percentage points of GDP. From the early 2020’s on the wedge grows steadily, reaching 5½ percentage points of GDP by 2059/60. Closing such a gap will not be an easy task eg, it is significantly bigger than the projected rise in the public pension, New Zealand Superannuation (NZS), over this period. However, it appears more “do-able” than closing the nearly 180 percentage points of GDP gap depicted in the equivalent Net Debt graphs. This is especially true in regard to readers of the LTF Statements who have limited knowledge of how the fiscal projections are constructed.

Figure 7 shows the respective DFC tracks themselves. The purpose of excluding the DFC from the first graph is to illustrate the gap that needs to be bridged between the two scenarios via a combination of expense control and/or revenue (mainly tax) increases. The DFC are a product of the debt stock. If debt is controlled via balancing all other expenses with revenue, they will not rapidly increase and accelerate the growth of the debt that generates them.

**Figure 7:** Core Crown debt-financing costs to GDP – Two scenarios from a Budget 2013 base



However, there is also a danger in omitting the DFC from the Operating Balance graph. Imagine that, based on that graph, it was concluded that the gap to close in around twenty years, say by 2034/35, was only around 2½ percentage points of GDP. A worse outcome still would be if that erroneous perception from the graph leads to a conclusion that fiscal consolidation could be delayed until that future time without too many consequences.

Without an appreciation that delay in reducing debt leads to ever increasing DFC, and once these have been allowed to occur then they are very much part of the gap that needs to be closed, some **dangerously wrong conclusions** could be derived.

If the decision was taken to do nothing for twenty years, then the true gap to be closed can only be appreciated by adding the gap between the “*Resume Historic Cost Growth*” and “*Spending path that maintains 20% Net Debt*” DFC tracks to the gap in the Operating Balance excluding DFC graph. In other words, the DFC have to be added back to the latter graph. If this was done then the true gap to close by 2034/35 would be around 4 percentage points of GDP, as the DFC add 1½ percentage points of GDP to overall expense track differences between the two scenarios by this time. By 2059/60 the 5½ percentage point gap between the Operating Balance excluding DFC tracks balloons to over 15½ percentage points as the DFC rapidly accelerate under the “*Resume Historic Cost Growth*” scenario.

Albert Einstein is claimed to have stated that compound interest is “*the most powerful force in the universe*”. If he did actually say that, the “*Resume Historic Cost Growth*” debt projections would back up the great physicist. Under “*Spending path that maintains 20% Net Debt*” the DFC to GDP slightly decline over time, reaching 1.5% by 2059/60. This is lower than the average of 1.7% between 1996/97 and 2011/12. While this could be viewed as optimistic, it is surely more plausible than the lift to 11.7% of GDP, by the same year, observed for the “*Resume Historic Cost Growth*” scenario.

The rapid increase in the DFC in this scenario also explains why Net Debt balloons under this projection technique. Once the DFC start to increase with the onset of operating deficits, they fuel a “debt-growth cycle”. They progressively add more to the annual borrowings, in order for the government to stay solvent, which in turn generates higher DFC each year.

This leads to something of a quandary for the LTF Statements. If the contrasting Operating Balance tracks are depicted over time without the DFC, they run the risk of “underselling” the fiscal challenge in any given future year. However, if they are included the gap they reflect is one that assumes nothing is done to address the fiscal pressures, as the growing DFC they incorporate only occur if the debt stock is allowed to keep increasing. In other words, neither portrayal is of much use in indicating the degree of the future fiscal challenge from any given starting year of fiscal consolidation.

The next section of this paper examines a couple of metrics for indicating the “cost of delay” in addressing the fiscal pressures produced from beginning fiscal consolidation in various future periods. It attempts to incorporate the very real costs of DFC that have been allowed to increase, with the debt stock, up to a certain period, along with the fact that these costs will diminish in periods beyond that as fiscal consolidation reduces the debt stock.

## 4.2 The current state of major expense and revenue categories under “Resume Historic Cost Growth” projections

The remainder of this section will look at the current state of projections of individual expense and revenue classes. While it is tempting to do that for both scenarios, “Resume Historic Cost Growth” and “Spending path that maintains 20% Net Debt”, that would entail selecting a suite of policy choices in the latter case.

For “Resume Historic Cost Growth” the projections are made in a bottom-up manner with assumptions aligned to the particular variable involved, particularly that of reflecting **current policy settings**. Hence for an expense class like NZS the current age of eligibility, annual rate indexation process, etc is projected. Likewise in tax revenue, the current personal tax thresholds and rates<sup>3</sup>, GST rate and coverage etc is projected into the future. While the assumptions used in the “Resume Historic Cost Growth” modelling can (and should) be debated, they represent Treasury’s best attempt to project out NZ’s current public fiscal settings.

By its very nature, the “Spending path that maintains 20% Net Debt” scenario represents a change. Its projection logic is governed by the annual funding amounts needed to stabilise Net Debt at a given percentage of GDP. As is clear by a comparison with the “Resume Historic Cost Growth” Operating Balance excluding DFC track, these annual funding amounts do not equate to the underlying pressures. Clearly choices are needed in order to stay on the “Spending path that maintains 20% Net Debt” Operating Balance track, but there are many ways in which that can be done. If, for example, the choice is to leave tax and NZS settings unchanged, that puts more pressure on spending areas like Health, Education, Law & Order etc. Alternatively it is possible to bridge the whole gap via tax increases, which would certainly lead to impacts on our economic growth, but cannot be ruled out as one of numerous potential options. There are changes that could be made to parameters of NZS that would lower its projected cost, easing the cuts needed in other spending areas and/or the lifts in tax required.

The list of potential options could go on and on, but the salient point is that any set of choices that is applied cannot maintain the current status quo in all areas. Hence that particular “solution” will involve a decision to change policy in at least one area. It is not the role of the LTF Statements, nor of this paper, to pick “winners” among the options. Current and future administrations, guided by the desires of the populace through the ballot box, will make those choices and no doubt there will be changes and reversals over time.

Rather it is the role of the LTF Statements to spell out the future challenges, explain their causes, and present an array of options available to address them. Some of the individual sections in the 2013 Statement, dedicated to a particular area, discuss what actions could be undertaken to reduce costs or lift revenue in the area. This is generally accompanied by a discussion of how that could be done while considering potentially competing aims such as fiscal savings, economic growth, equity and distributional issues, the environment etc.

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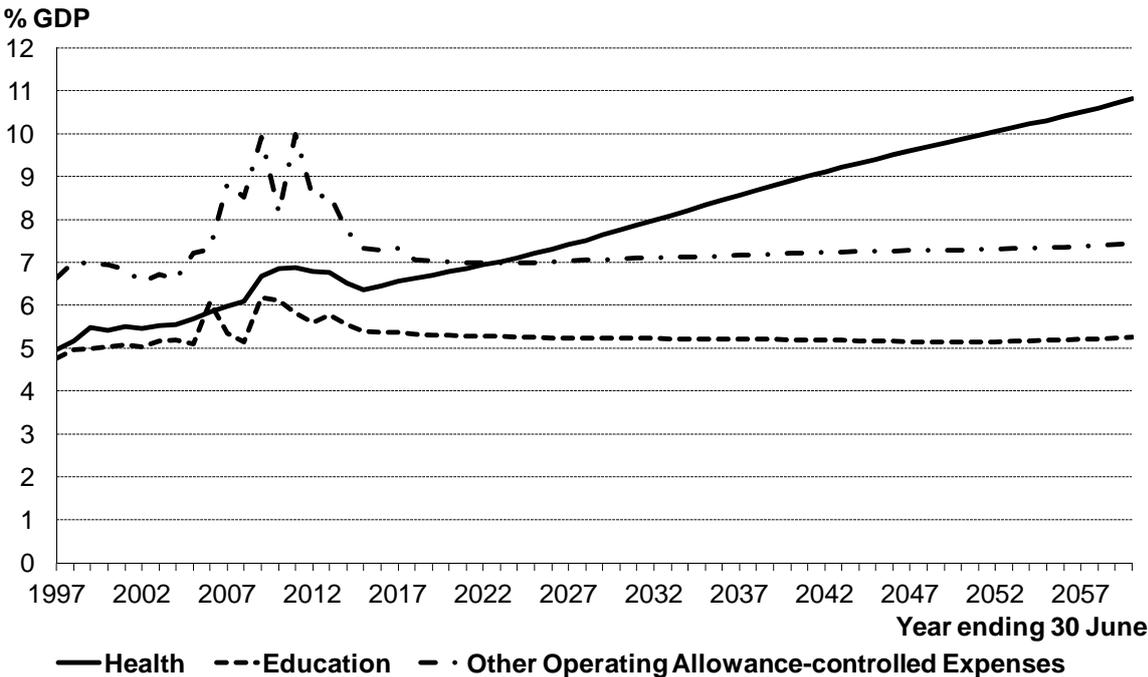
<sup>3</sup> This is not the best example to use here, as projecting source deductions (largely PAYE on salary, wages, benefits, superannuation contributions etc) tax revenue would, in theory, mean continuing to apply fiscal drag over the whole projection. In this case, practicality and history win out over the current policy rationale, and fiscal drag is only modelled for a few years beyond the forecast base. If this were not the case, a person on the adult minimum wage working a 40-hour week, who is currently facing the second to lowest tax rate, would be facing the highest personal tax rate by the early 2040s. NZ’s tax history also shows fiscal drag is addressed periodically via personal tax cuts.

Delving into the options in individual expense or revenue areas is not the remit of this paper. The “gap” that has to be closed in the Operating Balance ex DFC, between the “Resume Historic Cost Growth” and “Spending path that maintains 20% Net Debt” scenarios, has been illustrated. That is as far as the “Spending path that maintains 20% Net Debt” scenario can be examined while remaining neutral between the many options for how this can be achieved. Consequently only the “Resume Historic Cost Growth” individual spending and revenue class tracks are depicted in the following graphs.

### 4.3 Core Crown expense classes subject to allocations from Operating Allowances

Figure 8 depicts the current state of “Resume Historic Cost Growth” projections for major spending categories that, in a normal Budget process, derive their growth from allocated shares of an annual amount set aside for new spending ie, an Operating Allowance. Most functional spending classes are included in this allocation process, with the major exceptions being social welfare transfers, including NZS, and debt-financing costs (DFC). The welfare spending is treated as demand-based, and hence is forecast in a bottom-up manner from year to year, rather than be subject to what is effectively a cap on spending growth. Likewise the DFC are purely a function of gross debt levels and are forecast as such.

**Figure 8:** Major core Crown expense classes subject to allocations from Operating Allowances to GDP – projections under “Resume Historic Cost Growth”



The two largest single expense categories in the Operating Allowance-controlled group are Health and Education, but taken as a whole Other is, for now at least, bigger than either of those. In order of descending current size Other is comprised of: Core Government Services; Law and Order; Transport and Communications; Economic and Industrial Services; Defence, Heritage, Culture and Recreation; Environmental Protection, Primary Services; and a miscellaneous collection of small spending areas.

The breakdown between the demand-based and Operating Allowance-controlled spending categories is not quite as “clean” as suggested, for a few reasons.

- 1 There are areas of non-transfer welfare spending that are subject to the Operating Allowances. While the actual LTF modelling does allow for this, it is difficult to extract these divisions from historical data so the graphs used in this paper do not do so.
- 2 The operating expenditure of the New Zealand Transport Agency (NZTA), as well as their capital spending, comes purely from hypothecated transport taxes (petrol excise, road user charges and vehicle registration fees). The NZTA expenses are the biggest component of core Crown Transport and Communications. Again the LTF modelling allows for this tax/expenditure trade-off but NZTA expenses are not easily extracted from historical data and this dedicated tax arrangement has not always been in place. Consequently Transport and Communications are left in the mix in these graphs.
- 3 The forecast Operating Allowances generally do not equate to the overall growth in spending in these areas that actually occurs. While not so common in these austere times, “between Budgets” spending was quite frequently observed in the past – although it should be noted that any department or agency seeking such funding still had to apply for it and it needed to be approved by the government of the day. Operating Allowances have also been used in the past to fund tax cuts, and hence should not be thought of purely in terms of funding expense growth.

The obvious feature of the Operating Allowance-controlled expense graph is the ongoing rise, relative to GDP, of Health spending. There are two main factors behind this, namely:

- Demographically induced demand for health services grows at a much quicker rate than the demographic driver of GDP, which is effectively labour force growth. Put more simply, while all age groups in society make use of publicly-funded health services, spending is skewed towards older people and the older age groups are growing considerably more quickly than the labour force is. As an example, in the year ended 30 June 2010 the “65 and above” age group comprised 13% of the population and received 34% of publicly-funded health spending. This age group averages 1.8% growth annually over the projection period, 2015/16 to 2059/60, while the annual average growth of the labour force over the same period is only 0.6%. Despite the fact that the modelling of Health expenditure allows for some degree of “healthy ageing”, demographic growth is still a powerful driver. “Healthy ageing” refers to the observation that advances in medical treatments, dietary changes, reduced levels of smoking and other factors have improved older peoples’ health status over the decades. A 70-year-old now is not like a 70-year-old in the 1960s, and it is reasonable to expect such improvements in health status to continue in future.
- The non-demographic volume factor that is built into the bottom-up projections is stronger for Health than for other spending areas. The estimate used in the 2013 LTF Statement is 1.5% p.a. This growth driver is based on historical growth in the expense category beyond that which can be explained by the other drivers, namely demographic demand, inflation, labour input costs and productivity. In Health, where advancements in treatment from both technological change and medical research have improved the quality of life for many people, it is perhaps unsurprising that this factor is higher than in other expense categories. Research shows that there is a positive correlation in most advanced economies between income growth and demand for health services

Education, despite being a major spending category not far from the levels of Health in recent history, does not undergo strong projected growth but rather stays fairly constant as a proportion of GDP. The reason for this is basically the opposite to one of the factors behind Health’s increase, which is that the demographic growth driver for Education is weaker than that of the labour force in future years. While different for various educational areas, eg, the demographic

growth driving the tertiary sector is stronger than that for early childhood education, averaged out it equates to only about a third of the labour force's growth across projected years. That raises an obvious question of why doesn't overall Education expense behave in the opposite way to Health ie, fall relative to GDP rather than level out? The answer lies in the fact that Education also has a non-demographic volume driver, and while not as strong as that applied to Health, it is still enough to largely counteract the "demographic dividend".

The "spikes" in the Education track in recent years are mainly due to movements in impairments and write-downs on Student Loans, which are a component of tertiary education spending. Such things are always likely to occur but, like valuation changes on assets, are too unpredictable to build into projections and are generally temporary in nature.

Like Education, Other Operating Allowance-controlled expenses remain fairly level relative to GDP over the projection horizon. However the reasons this occurs are not the same. With the exception of Law & Order, where there is a small "demographic dividend", ("crime is a young man's game"), most of these spending classes are difficult to ascribe to various demographic or gender groups. How does public expenditure on Defence or Core Govt. Services differ in terms of its benefit to 70-year-old males, 30-year-old females or pre-schoolers? Possibly there are differences but defining them is very hard. Hence most of these categories<sup>4</sup> simply have the growth of the adult population (15 and above) applied as their demographic driver. This is a little stronger on average across the projection horizon (0.7% p.a.) than the labour force (0.6% p.a.), largely because labour force participation rates are lower among the "65 and above" age groups. Despite the non-demographic volume factor being a little weaker than that of Education, the stronger demographic driver is enough to result in a very slight lift, as a ratio of GDP, in the "Other" category over the projections.

The spikes in recent years are the result of a few different contributions from various areas. Core Government Services are impacted by the tax receivable write-downs and impairments. Beyond 2006/07 these are quite volatile in historical years, suggesting their lower and far more constant values in earlier years were a product of a different measurement technique. Like the Student Loans spikes in Education, these erratic valuation-based measurements cannot be projected into the future. Transport and Communications also lifted in 2006/07, due to NZTA spending increases, although this change was more of a permanent upwards shift rather than the product of valuation fluctuations. In the 2010/11 there are temporary rises, related to the earthquakes in Canterbury, in a few categories covered by Other.

#### 4.4 Core Crown social welfare spending, including New Zealand Superannuation

The demand-based nature of social welfare spending, including NZS, has already been outlined. The "Resume Historic Cost Growth" scenario projections of these are shown in Figure 9.

The path of the public pension NZS is easy to explain. Two factors influence both the decline in the first decade shown and the ongoing rise in all later years. These are the demographic driver, which is the growth of the "65 and above" age group, and the rate indexation process.

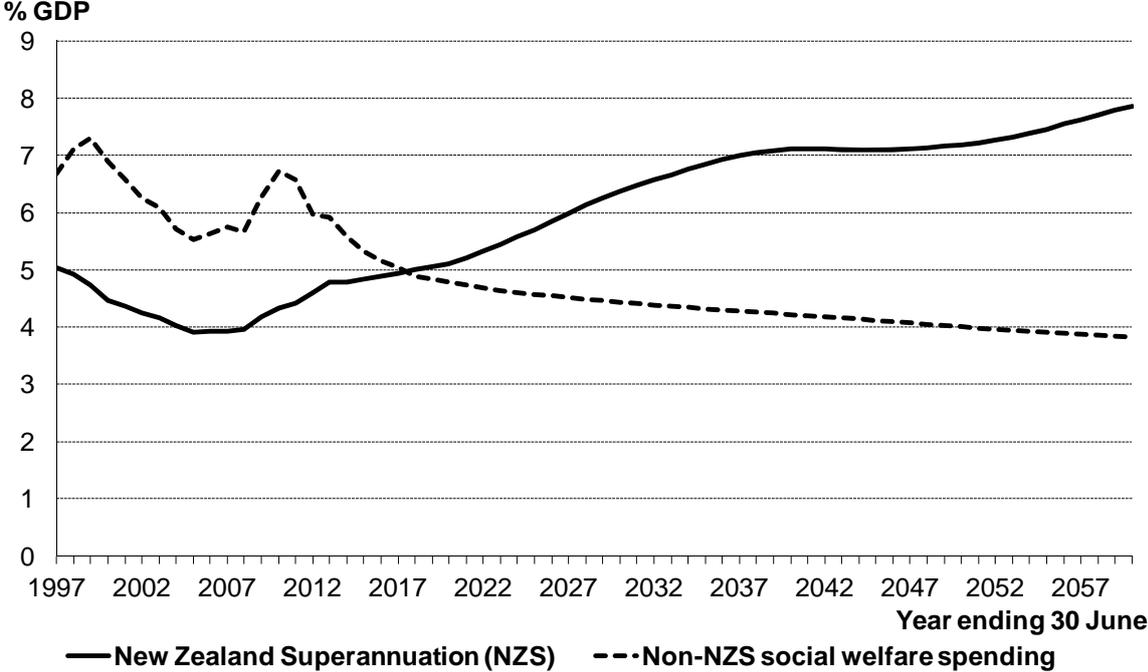
In regard to the decreasing ratio of NZS to GDP from 1996/97 to 2004/05, this was greatly influenced by a gradual lifting of the age of eligibility from 60 to its present setting of 65 between 1992 and 2001. Even when recipient numbers stopped declining after 2001, rates

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<sup>4</sup> The exception of the dedicated tax funded growth of Transport and Communications has already been discussed.

were above the “wage floor” used in annual indexation and hence only CPI-measured inflation indexation was applied. The first wage indexation did not actually occur until 2007.

**Figure 9:** Core Crown demand-based Social Welfare spending to GDP – projections under “Resume Historic Cost Growth”



Beyond 2007/08 both of these factors effectively reverse. The annual growth rate of the “65 and above” age group lifts (the current year, 2011/12, is the zenith at 4.1%) and exceeds general population growth over all future years of the projection. Wage indexation applied on 1 April 2011, 2012 and 2013 and is expected to apply in all but one year of the Budget 2013 forecast base. As wage growth outstrips inflation in projections, this carries on in all projected years. Put simply, NZS projections have a similar per capita growth rate to GDP and a far stronger demographic driver, meaning they continually lift as a percentage of GDP over projections.

Explaining the path of Non-NZS social welfare spending is even simpler. The decline in most historical years is the combination of falling recipient numbers and CPI indexation (in the cases where any annual indexation is applied) to rates. It may surprise some to know that overall numbers on the main working-age benefits – Unemployment Benefit (UB), Domestic Purposes Benefit (DPB), Sickness Benefit and Invalid’s Benefit - declined in this period, but it is true. In 1996/97 the monthly average for these combined benefits was 380,000. A decade later, in 2006/07, that had reduced to 280,000. The advent of the GFC in the second half of the calendar year 2008 pushed numbers up again, and these impacts are still seen across the Budget 2013 forecasts, although they do recede somewhat over these years.

In the projections these benefit recipient numbers grow in line with their main demographic groups eg, Sole Parent Support numbers are heavily influenced by the growth of females between the ages of 20 and 45. Jobseeker Support is somewhat different in that, as well as pure demographic change in the age groups that dominate its receipt, it is also aligned to the growth of the unemployed labour force. After unemployment rates stabilise in projections, the growth rate of the unemployed labour force just parallels that of the overall labour force.

It isn’t the demographic drivers that are the cause of the drop in Non-NZS welfare spending to GDP over the projected years. It is true that they are not quite as strong as the labour force growth behind GDP, but the differences are almost insignificant. The driver of this decline is CPI

indexation of the majority of benefit rates over the entire projection. With per capita GDP growing in line with nominal wage growth, this projects a future where the incomes of beneficiaries do not keep up, in terms of growth, with those of workers and superannuitants.

The assumption is based on historical behaviour and there is little evidence of anything but price indexation applied to working-age benefit rates in NZ's past. History is usually the best basis for projection assumptions, unless policy change has recently occurred or is known to be planned, or the projection is deliberately designed to portray the impacts of changes.

Despite the last comments, some changes have been made to working-age welfare expenditure projections relative to previous LTF Statements. Some of the supplementary benefits, such as Accommodation Assistance and Income Related Rents, as well as Family Tax Credit, have been modelled with nominal wage indexation. Some strengthening of recipient growth has also occurred in supplementary benefits like Disability Assistance and Working for Families tax credits.

The reasons for these changes are discussed in more detail in the background paper to the 2013 LTF Statement, *Working Age (Non-NZS) Welfare*. This paper also discusses the impacts of these changed assumptions on the fiscal position and, to a lesser extent, economic growth, as well as what they imply for equity and distributional considerations.

It suffices to say here that the changes have been made in recognition of some of the trends seen in supplementary benefits over the last decade and more. The number of recipients of supplementary benefits such as Accommodation Assistance has risen at a faster rate than general adult population growth. Some of the cause of this is because such supplementary benefits are generally provided via some kind of income test, relative to average levels across the population. Hence, as CPI-indexed main benefit rates have reduced relative to the earnings of workers and superannuitants, more beneficiaries (and low income non-beneficiaries) have become eligible for supplementary assistance and/or received more from these sources. Policy change, especially in the area of the generosity of Working for Families tax credit rates, has also been a factor in keeping overall non-NZS welfare spending higher than would be expected under pure CPI-indexing of rates.

## 4.5 Core Crown revenue

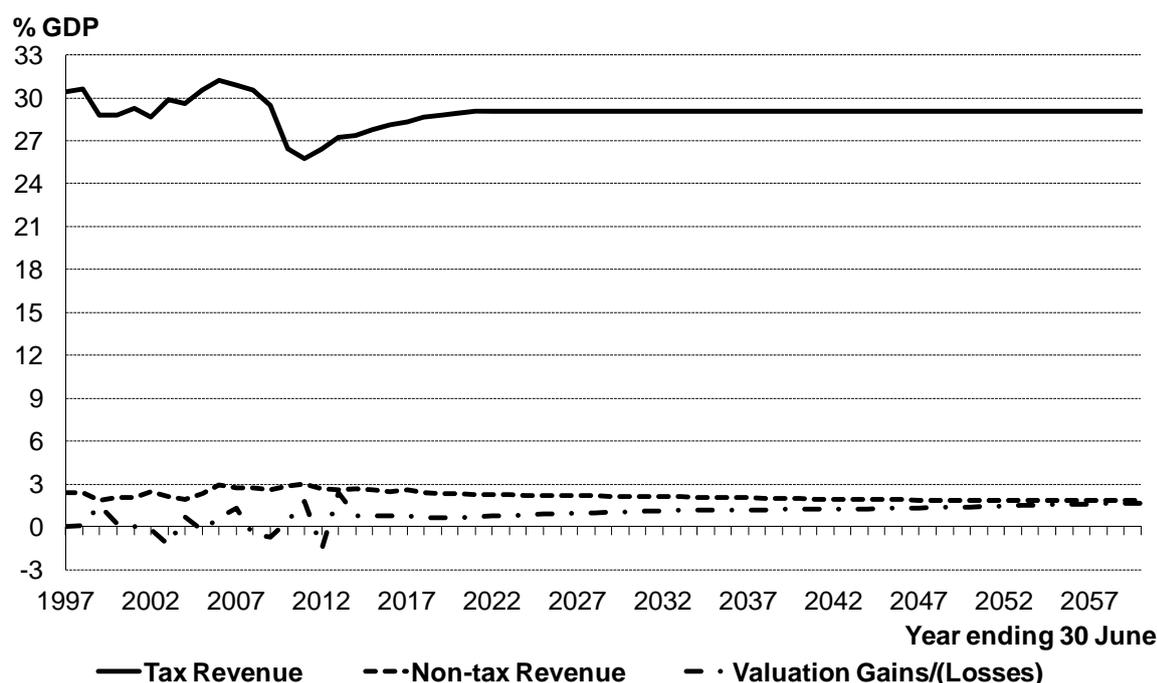
The final graph depicted in this section, Figure 10, is that of the recent history, Budget 2013 forecasts and projections of core Crown revenue categories. This is dominated by tax revenue and the projection of tax is designed to reflect the current NZ regime.

As has been explained in an earlier footnote, a true projection of current policy would apply fiscal drag to any tiered rate tax type, in particular source deductions, but practicality and history win out in this case. Fiscal drag is not modelled beyond, at most, five years into projections. Given that it is incorporated in the five-year forecast base, this means fiscal drag is applied for around a decade, which is an adequate approximation of the average length between major personal tax cuts in NZ since GST was introduced in 1986. Addressing fiscal drag<sup>5</sup> effectively means ongoing changes to any non-“flat rate” tax type (just personal income taxes in NZ). While these adjustments would not really occur annually, that is a common modelling simplification in projections and makes little difference to overall outcomes.

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<sup>5</sup> The earlier footnote on fiscal drag did not define it. In a tax system with multiple tax thresholds, as taxable incomes increase, tax revenues increase more than proportionately. This is due to a higher proportion of income being taxed at higher rates as income increases. The additional increase in taxes is known as fiscal drag because it has the effect of removing aggregate demand from the economy.

Figure 10: Major core Crown revenue to GDP – projections under “Resume Historic Cost Growth”



Changes to the tax regime occur annually, although most are not major reconstructions like the introduction of GST. As such that makes it hard to select an overall tax-to-GDP ratio that would reflect the current tax regime in the theoretical economy that applies in projected years ie, one that is free of cycles and growing on trend. Such an economy never really occurs and the tax system does not stay unchanged long enough to reliably average its ratios to GDP through upturns and downturns. Even without purposeful changes to tax parameters, fiscal drag is always affecting the ratio of tax revenue to GDP from year to year.

Accepting those difficulties, the “Resume Historic Cost Growth” projection logic brings the various tax types to a combined 29% of GDP four years into projections and then holds them at that ratio in later years. Apart from modelling fiscal drag, much of the increase in early projected years reflects recovering tax types from the lingering negative impacts of the GFC. Corporate tax, for example, takes a couple of years beyond the end of the forecast base to return to “normal” levels as firms use up tax losses.

Non-tax revenue types are roughly evenly split between investment income, such as interest from financial assets, and non-investment income, such as fees, fines and levies charged by various departments. The latter are only projected at the growth of inflation. However this decline against GDP is largely countered by core Crown investment income growing more quickly than GDP. The reason for that is because it is dominated by the investment income of the New Zealand Superannuation (NZS) Fund, which has an expected long-run annual rate of return of over 8% over the projection horizon.

Core Crown valuation gains/(losses) are also dominated by growth in the holdings of the NZS Fund, so rise quicker than GDP. This lift does reduce over time as capital withdrawals from the Fund, to help pay the future costs of NZS, reduce its size relative to GDP.

The non-tax revenue forms are helpful. However the graph indicates that they can only play a very limited role in any future mix of policy change that includes revenue increases to close the gap between the “Resume Historic Cost Growth” and the “Spending path that maintains 20% Net Debt” Operating Balance tracks. Tax will need to be the focus of any options that involve higher revenue as part of their solution.

## 4.6 Increasing pressures and their sources

Table 1 provides a summary, in decade-long intervals, of the increasing difficulty of balancing budgets, and hence stabilising debt, over time. This is under the “Resume Historic Cost Growth” scenario, which assumes that ongoing deficits are simply covered by increased borrowing.

**Table 1:** Major expense and revenue classes over time under “Resume Historic Cost Growth” projection

Year ending 30 June	2010	2020	2030	2040	2050	2060
<i>All as % of nominal GDP</i>						
Health	6.8	6.8	7.7	8.9	9.9	10.8
Superannuation (NZS)	4.3	5.1	6.4	7.1	7.2	7.9
Education	6.1	5.3	5.2	5.2	5.1	5.2
Other Op. Allow. Covered	8.2	7.0	7.1	7.2	7.3	7.4
Non-NZS Welfare	6.7	4.8	4.4	4.2	4.0	3.8
Debt-financing costs (DFC)	1.2	1.8	2.5	4.2	7.1	11.7
<b>Total Expenses</b>	<b>33.4</b>	<b>30.8</b>	<b>33.4</b>	<b>36.9</b>	<b>40.6</b>	<b>46.8</b>
<b>Revenue (majority tax)</b>	<b>29.7</b>	<b>31.9</b>	<b>32.2</b>	<b>32.2</b>	<b>32.3</b>	<b>32.6</b>
<b>Expenses less revenue</b>	<b>3.7</b>	<b>-1.1</b>	<b>1.2</b>	<b>4.7</b>	<b>8.3</b>	<b>14.2</b>
<b>Gap excluding DFC</b>	<b>2.5</b>	<b>-2.9</b>	<b>-1.3</b>	<b>0.5</b>	<b>1.2</b>	<b>2.5</b>
<b>Core Crown Net Debt</b>	<b>13.9</b>	<b>27.4</b>	<b>37.1</b>	<b>67.2</b>	<b>118.9</b>	<b>198.3</b>

The table is notable for a number of points, these being:

- The strong growth of Health and NZS expenditure, relative to nominal GDP. These two expense types in particular are driven up by the faster growth of the “65 and above” age group relative to the labour force.
- The rapidly rising debt financing costs. It is these in particular that fuel the growth of debt via interdependence with the debt stock. In other words, as borrowings grow to cover deficits they drive up the annual interest costs on debt, which in turn add to the debt stock that is generating the borrowings.

At any year shown, it is important to realise that bridging the “Expenses less Revenue” will only prevent ongoing deficits from adding to the growing debt stock. At best it will prevent the Net Debt to GDP rising any further than the level it has already reached. Reducing it back to 20% of GDP, say, becomes a much harder task over time and involves the need to produce greater levels of surpluses the longer the “Resume Historic Cost Growth” track is allowed to continue.

## 5 The costs of delay – fiscal consolidation now versus waiting until a future date

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### 5.1 Two metrics for measuring the cost of delay

The last section of this paper discussed the difficulties of expressing the “gap” that needed to be closed in any given future year, in order to bring a “*Resume Historic Cost Growth*” track into line with a “*Spending path that maintains 20% Net Debt*” track and keep it there. When the DFC were omitted it risked “underselling” the extent of fiscal consolidation required to bridge the gap. Including the DFC did not reflect that preventing the rise of debt from that point forward would stem the growth of the DFC too.

The “*Spending path that maintains 20% Net Debt*” scenario assumes some degree of fiscal consolidation is conducted throughout the projections. The current forecast base uses small Operating Allowances, by historical standards, to help the fiscal position recover from the ravages of the GFC. While future Operating Allowances, as percentages of GDP, are increased as core Crown Net Debt gets close to, and then stabilises at, 20% of GDP, this scenario never returns to the bottom-up growth of non-welfare, non-DFC expense classes that the “*Resume Historic Cost Growth*” track applies.

Variations on the “*Spending path that maintains 20% Net Debt*” track can allow this bottom-up expenditure growth to run, from the year ended 30 June 2016 (2015/16) start point assumed under “*Resume Historic Cost Growth*”, until a chosen future year to restart fiscal consolidation. There are two methods of contrasting this delayed fiscal consolidation with that done under the main “*Spending path that maintains 20% Net Debt*” scenario.

One method is to apply the same degree of fiscal consolidation as assumed under the “*Spending path that maintains 20% Net Debt*” scenario, in terms of the same kinds of reduced Operating Allowances relative to GDP. The “*Spending path that maintains 20% Net Debt*” scenario took six years, inclusive of its starting year, from 2015/16 until Net Debt reached 20% of GDP in 2020/21 and was then stabilised there. From the later starting year for fiscal consolidation, the number of years to achieve the same objective indicates how much longer, in this future period, similar degrees of lower public spending and/or higher taxation will need to be undergone in return for delaying this now.

The other way of contrasting the cost of delay is to measure what average annual levels of core Crown Operating Balances to GDP need to be achieved, from the later start point of fiscal consolidation, in order to force Net Debt down to 20% of GDP within six years, and stabilise it there. In the “*Spending path that maintains 20% Net Debt*” scenario, starting in 2015/16 the average core Crown Operating Balance over the six year period between 2015/16 and 2020/21 inclusive was 2.3 percentage points of GDP.

### 5.2 Illustrating the impact of delaying fiscal consolidation for a decade

The next two graphs, Figures 11 and 12, relate to delaying the onset of fiscal consolidation until 2025/26, a decade beyond the 2015/16 start point of the “*Spending path that maintains 20% Net Debt*” scenario. Such illustrations could be produced for any of the delay periods outlined in Table 2, which follows the graphs.

**Figure 11:** Core Crown net debt to GDP – ongoing fiscal consolidation versus delaying action for 10 years

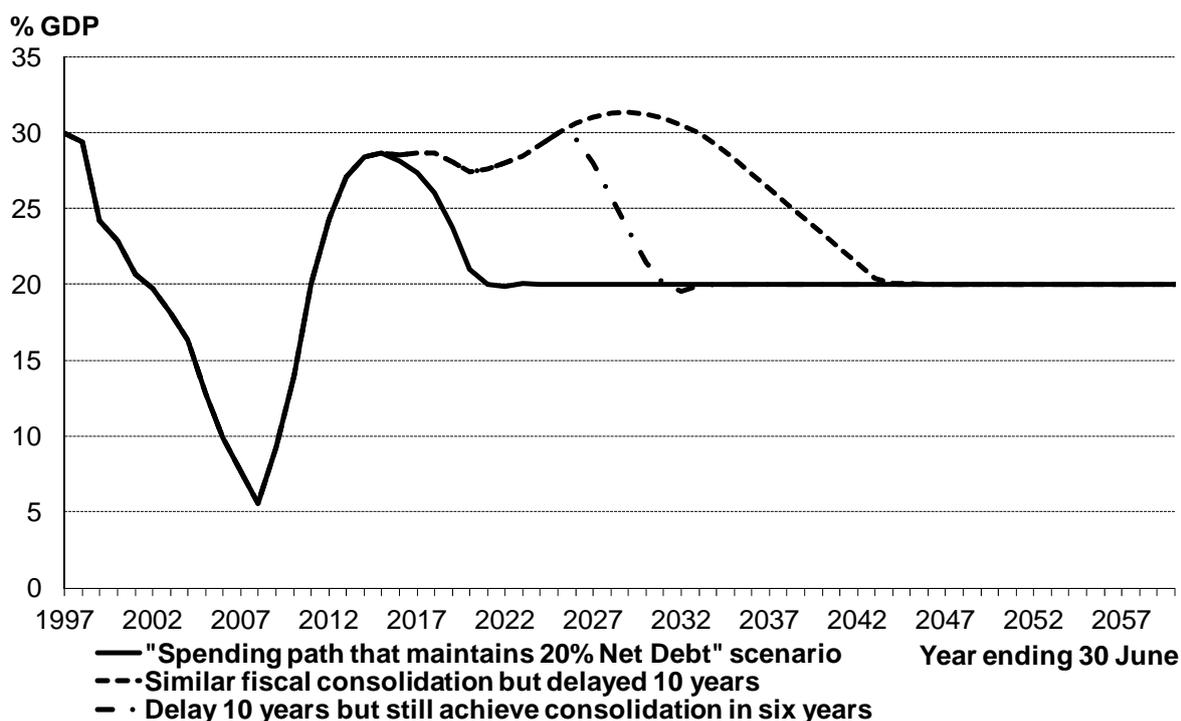


Figure 11 illustrates that, in either of the variations on the *Delay 10 years* scenario, 20% of GDP is eventually reached and maintained. As would be expected, delaying fiscal consolidation allows Net Debt to rise to higher levels of GDP, than under the “*Spending path that maintains 20% Net Debt*” scenario, for both variations. In the case where similar fiscal consolidation is applied as under the “*Spending path that maintains 20% Net Debt*” scenario, it is clear that reaching 20% of GDP takes considerably longer than six years – it takes 19 years! While not quite so obvious from the graph (a ruler might be needed to confirm it), the more severe fiscal consolidation scenario takes the same period of six years, once it begins, to reach 20% as the “*Spending path that maintains 20% Net Debt*” scenario does.

Translating this to Figure 12, which shows core Crown Operating Balances to GDP, it is unsurprising that the *Delay 10 years* variations, relative to the “*Spending path that maintains 20% Net Debt*” scenario:

- Require higher levels of Operating Balances to GDP to be maintained for longer when similar fiscal consolidation is applied; and
- Involve pushing Operating Balances to GDP above the highest levels required under “*Spending path that maintains 20% Net Debt*” when fiscal consolidation is achieved in the same time period.

**Figure 12:** Core Crown operating balance to GDP – ongoing fiscal consolidation versus delaying action for 10 years

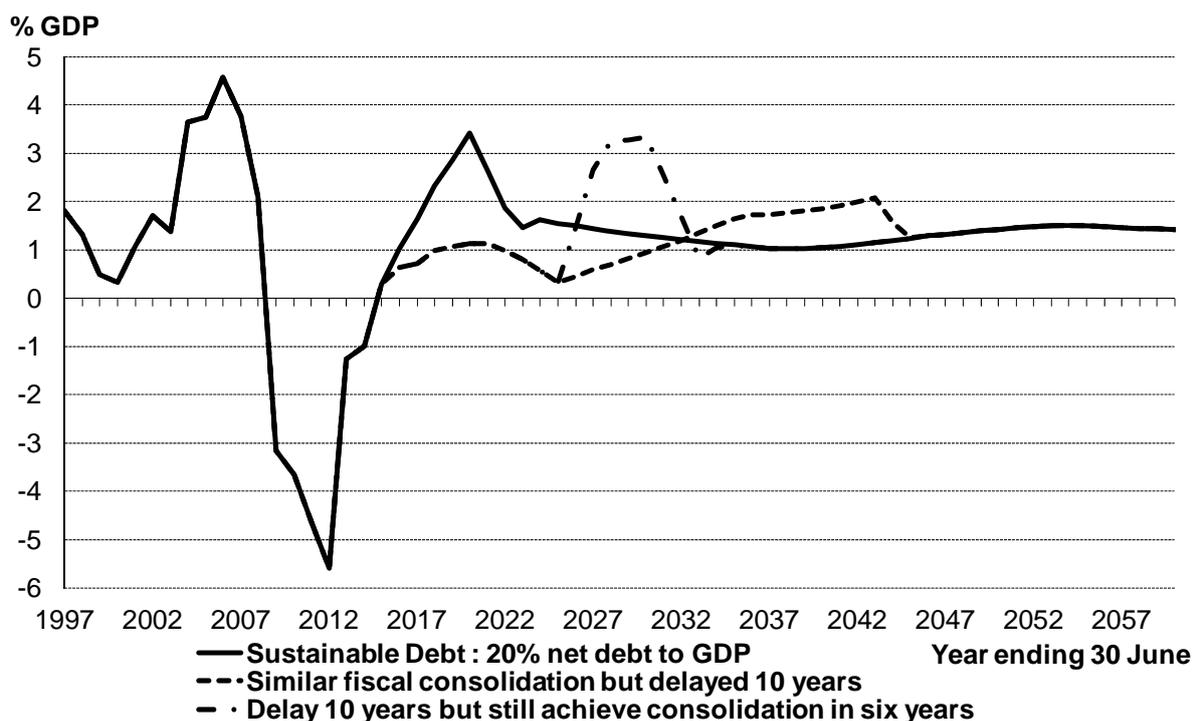


Table 2 provides metrics for comparing the fiscal consolidation required, under both variations, when the delay is for five, ten and fifteen years respectively.

**Table 2:** The cost of delay in terms of either time to achieve 20% net debt or the degree of stringency required

Fiscal Consolidation scenario	Length, in years, of consolidation until Net Debt stabilised at 20% of GDP	Average Operating Balance to GDP over years of consolidation
<i>“Spending path that maintains 20% Net Debt”</i>	6 from 2015/16	2.3%
<i>Delay 5 Years – Similar consolidation</i>	10 from 2020/21	2.0%
<i>Delay 5 Years – Six years of consolidation</i>	6 from 2020/21	2.6%
<i>Delay 10 Years – Similar consolidation</i>	19 from 2025/26	1.4%
<i>Delay 10 Years – Six years of consolidation</i>	6 from 2025/26	2.8%
<i>Delay 15 Years – Similar consolidation</i>	Not achieved by 2059/60 if start delayed until 2030/31	Not achieved in 15 years from 2030/31
<i>Delay 15 Years – Six years of consolidation</i>	6 from 2030/31	3.5%

The table puts numbers to various scenarios. However, the general pattern of results is clear and some of the trends could probably have been surmised without any modelling.

Firstly, when a similar degree of fiscal consolidation is applied as under the *“Spending path that maintains 20% Net Debt”* scenario, the longer the delay in applying fiscal consolidation,

the more extended the length of the consolidation period. By the time consolidation is delayed 15 years, out to a 2030/31 start year, core Crown Net Debt cannot be reduced to 20% of nominal GDP by 2059/60 under this variation.

Secondly, when fiscal consolidation to attain Net Debt at 20% of GDP within a six year period is desired, the average Operating Balances achieved over these six years of consolidation have to increase the longer the delay in the onset of consolidation. To put perspective on a figure like the average 2.8% of GDP that needs to be maintained for six years if consolidation is delayed a decade until 2025/26, an average of 2.0% was achieved in the decade from 1996/97 to 2005/06. This was considered a quite prosperous period for the NZ economy, with above-average growth and strong returns for our export commodities. It was also a period before any major impact of the ageing population had been felt.

## 6 Removing years of Operating Allowance-controlled spending from the base

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### 6.1 The forecast base of Operating Allowance-controlled expenses

The introduction to this paper briefly outlined the major differences between the “*Resume Historic Cost Growth*” and “*Spending path that maintains 20% Net Debt*” scenarios. Section 4 discussed the bottom-up modelling of expense classes and tax revenue under “*Resume Historic Cost Growth*” and noted that the Treasury paper *Long-term Fiscal Projections: Reassessing assumptions, Testing new perspectives* provides even more detail about this.

The reason that this section starts with reference to these differences is because the forecast base of the Operating Allowance-controlled expense projections, be they under “*Resume Historic Cost Growth*” or “*Spending path that maintains 20% Net Debt*”, is effectively produced under “*Spending path that maintains 20% Net Debt*” logic. In the Forecast Statement of Financial Performance – Functional Expense Analysis tables in Budget 2013 (or in any EFU), over the forecast years, most classes of spending are fairly flat. The major exceptions are Social security and welfare, DFC and Forecast new operating spending ie, the Operating Allowances. This is not because there is an expectation of no growth in Health, Education, Law and Order, Defence etc spending over the forecast years. Rather it is because the new spending in these areas will not be treated as demand-based, as Welfare or the DFC are, but rather allocated from these Operating Allowances. The latter can, and have in past Budgets, been used to offset tax revenue reductions too.

Under “*Spending path that maintains 20% Net Debt*” this “capped spending” approach extends out into projections, with annual amounts of new funding, effectively annual Operating Allowances, determined by what can be afforded while keeping Net Debt stable as a percentage of GDP.

This is not how the “*Resume Historic Cost Growth*” scenario projects these Operating Allowance-controlled expense classes. It applies various growth drivers aligned to the individual expense types, ie, a bottom-up projection. These bottom-up growth drivers generally produce expense growth beyond that allowed for in the projected Operating Allowances.

In the past LTF Statements these bottom-up expense projections normally launched from the end of the forecast base. However that modelling approach has received criticism. The rationale of the critics was that the Operating Allowances are what is planned but haven’t actually occurred. If they are not adhered to and immediate spending pressures are funded, the actual base of the projections will be higher and this difference will be magnified over the projection horizon. The only reliable base for expense category projections is history, and the last known year values are from where they should launch.

There is some validity in these criticisms. The Operating Allowances are forward-looking, planned expenditure growth, not reality. They have not always been adhered to and the use of “between Budgets” spending in the past has already been mentioned. It is not a common occurrence in NZ’s history to find governments have spent less than they budgeted for via the Operating Allowances, unless economic conditions have changed markedly on them and they have had to readjust spending plans in light of a reduced tax outlook.

On the other hand, spending plans in the forecasts have to be credible as they are built into the planning of not just the government of the day, but businesses, local government, NGOs, unions, the public etc. They are also used to guide the decisions of investors, both domestic and foreign, trading partners and international credit rating agencies.

## 6.2 The compromise position of removing two forecast years of Operating Allowance-controlled spending

The option that is pursued in the 2013 LTF Statement is one that should hopefully go some way to appeasing these criticisms, but also acknowledge that governments will endeavour to adhere to the spending plans that they themselves set.

It uses the Operating Allowances to set expense bases for projections in the years of the forecast horizon for which the current administration will be responsible for the Budget. Bottom-up expense projections begin in forecast years that occur after the next election, for which it is possible that a different administration will be making spending plans. For the 2013 Budget EFU, the final two years of the forecast horizon, namely 2015/16 and 2016/17, fall into this category and hence are modelled, in the “*Resume Historic Cost Growth*” scenario, with bottom-up expense projections rather than top-down Operating Allowances.

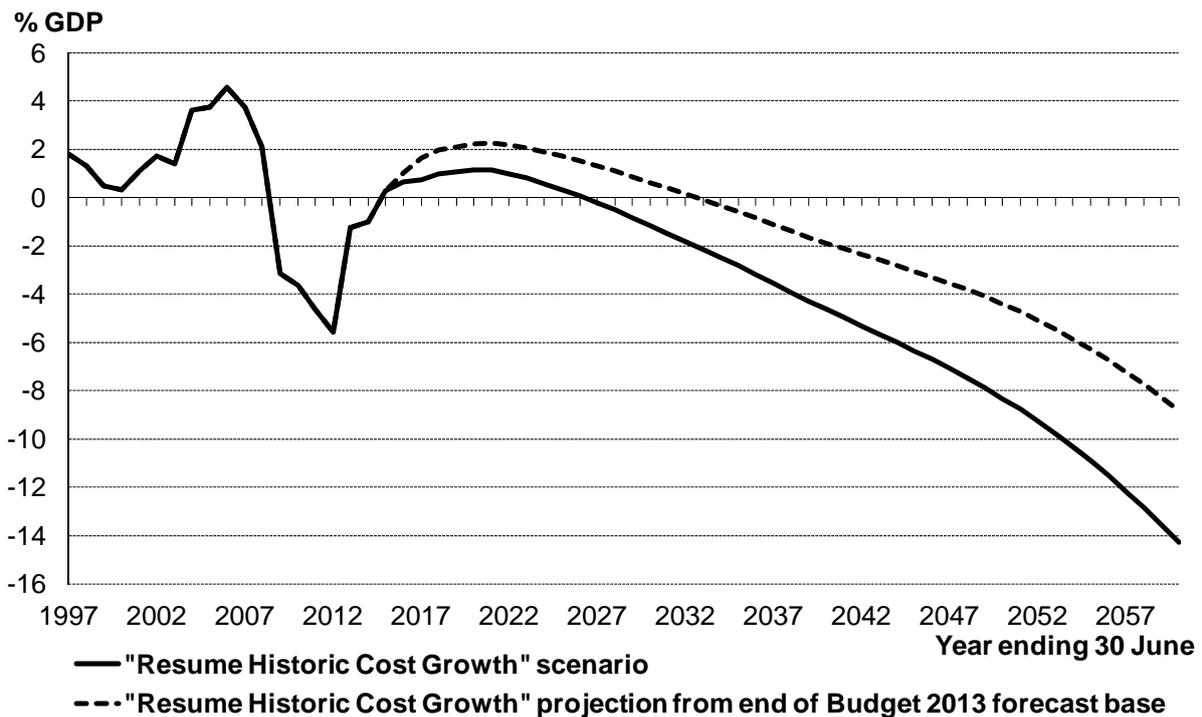
The following graphs compare tracks using the “*Resume Historic Cost Growth*” projection technique from the normal end-of-forecast base and from a base two years earlier (2014/15) for the Operating Allowance-controlled expense classes. Demand-based welfare expenses still use the full forecast base as forecasts of these expenses are likely to be more accurate than projections. Graphs of both core Crown Operating Balance and Net Debt are illustrated.

Figure 13 shows that Operating Balances fall into deficits earlier when bottom-up projections begin two years before the end of the forecast base. This is as might be expected, given that the Operating Allowances used over the Budget 2013 forecast base are quite small by historical standards, to help achieve recovery from the impacts of the GFC,

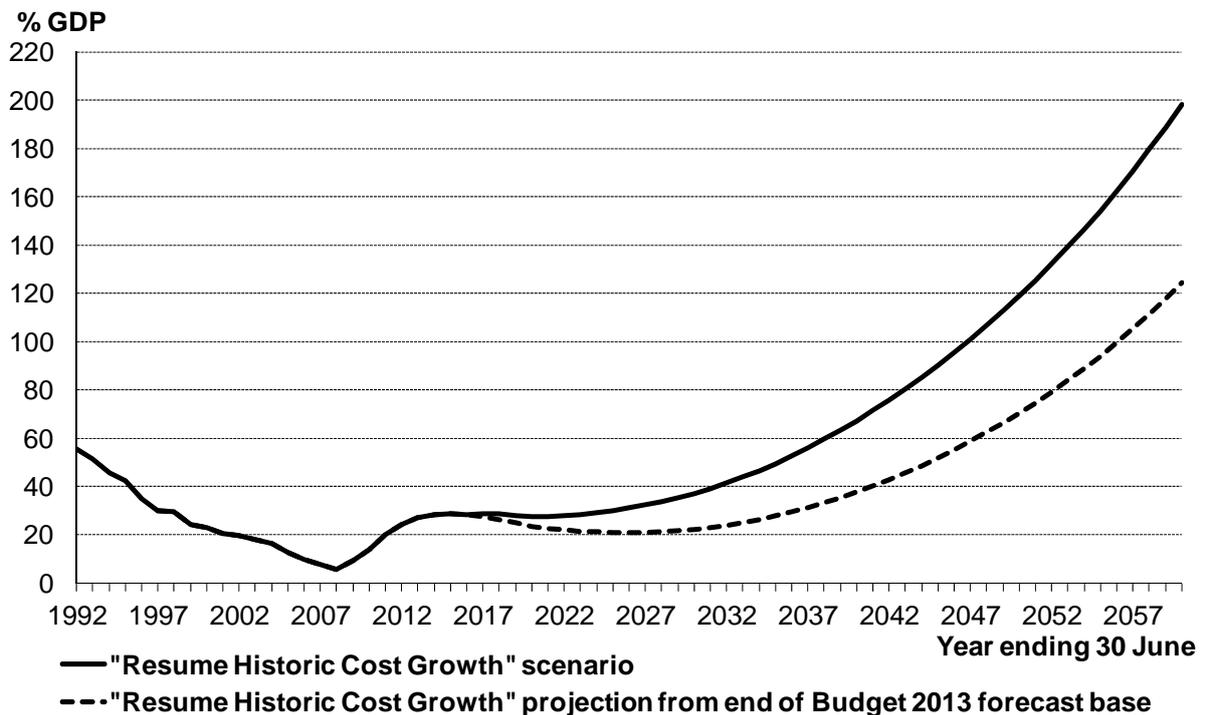
With Operating Deficits occurring sooner due to the higher expense growth that ensues when bottom-up projections begin two years earlier, Net Debt also rises more rapidly under this modelling technique, as is illustrated in Figure 14.

As a result, returning Net Debt to 20% of GDP is more of a fiscal challenge when the “*Resume Historic Cost Growth*” bottom-up expense modelling begins two years earlier.

**Figure 13:** Core Crown operating balance to GDP – “*Resume Historic Cost Growth*” scenarios from different projection bases



**Figure 14:** Core Crown net debt to GDP – “Resume Historic Cost Growth” scenarios from different projection bases



There is more to be gained from this new approach to the “Resume Historic Cost Growth” modelling of expenses than just an appreciation of the increased fiscal challenge. It demonstrates two things about the projections of which readers of the LTF Statements should be cognisant.

Firstly, that they are very sensitive to the forecast base from which they arise.

Secondly, and possibly more important as a LTF message, the fiscal consolidation built into the forecasts, via capping spending through the use of Operating Allowances, is good for the

long-term fiscal position. This is in line with one of the guiding principles published with the last Statement, which was “Make early change”. Reducing spending gradually, before changes to the population structure really start to impact, will reduce the need for more drastic adjustments at a later time and give people more time to adjust.

## 7 Tax revenue and the role it can play in Long Term Fiscal projections

### 7.1 The history of tax revenue to nominal GDP

Section 4 discussed the projection of tax revenue under the “Resume Historic Cost Growth” scenario. In particular it noted that the various tax types are brought to a combined 29% of GDP about four years into projections and then held at that ratio in later projected years. In other words, once the various tax types have been brought to their estimated long-term, stable ratio to GDP, they simply grow in line with GDP. The 29% figure reflects Treasury’s attempt to model the current NZ tax regime, albeit free of fiscal drag, in the growing-on-trend, cycle-free world of the long-term projections.

**Figure 15:** Total Crown tax to GDP in history

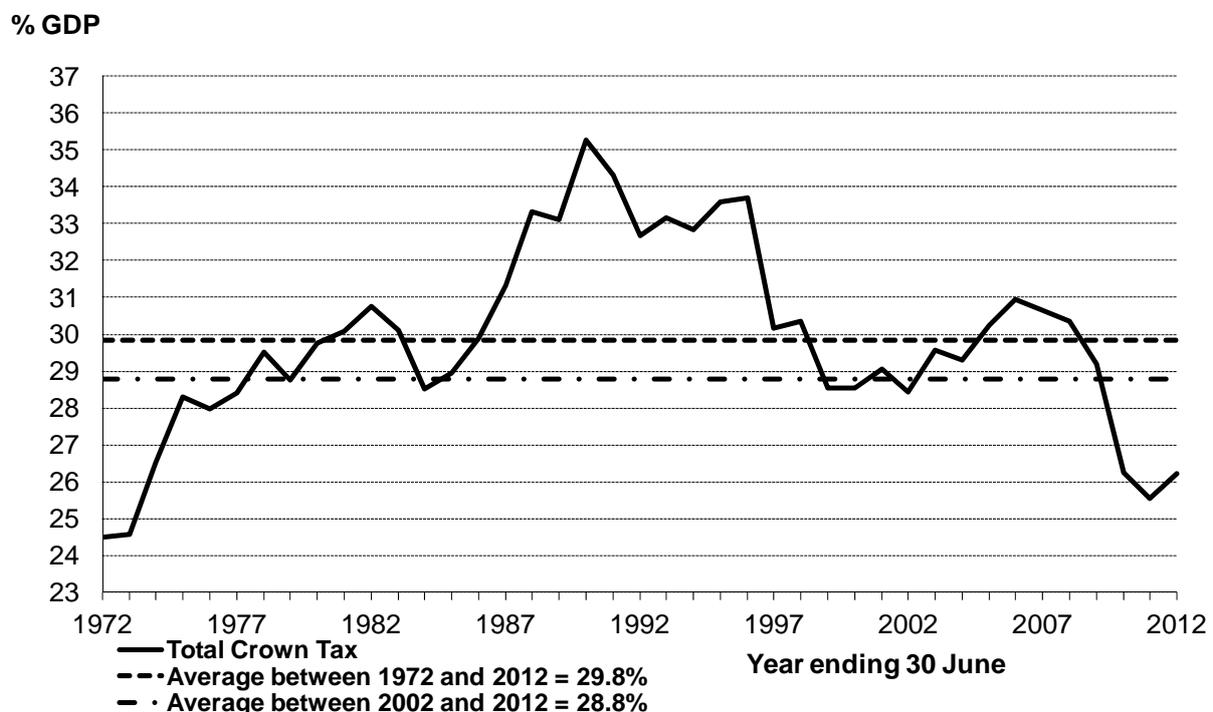


Figure 15 depicts the history of the NZ tax to GDP ratio over the last 40 years. Unfortunately it is Total Crown tax revenue, rather than core Crown, as data sources for the latter have not been backdated beyond 1993/94. It also consists of a mix between cash measures prior to 1993/94 and accrual revenue measures beyond that. Neither are major problems. Core Crown tax revenue is not significantly greater than the Total Crown measure –between 2006/07 and 2011/12 the average wedge was only 0.8% higher. While cash and revenue measures can differ markedly between months, this is normally due to timing issues around recognition and receipt of the tax liability and fiscal year totals are generally close.

It is clear from this graph that the tax-to-GDP ratio for NZ has differed quite markedly over the last 40 years, being as low as under 25% and as high as above 35%. The 2011/12 ratio of 26.2% is low, but this is affected by the lingering negative impacts of the GFC on various tax bases, especially corporate tax and PAYE.

The average over the last 40 years, admittedly an average of quite an erratic annual series, is a 30% tax-to-GDP ratio. This is a full percentage point of GDP higher than the long-term stable tax-to-GDP ratio used in the “*Resume Historic Cost Growth*” scenario. That does not mean that assumption is wrong (although it has already been outlined that it is a difficult assumption to estimate). It is important to remember that the 29% tax-to-GDP ratio is an attempt to model the **current** NZ tax regime, not an average over history.

What it does indicate is that a future sustained lift in the tax-to-GDP ratio, as part of the mix of policies required to meet the “*Spending path that maintains 20% Net Debt*” Operating Balance track, is a quite valid assumption. A rise of one percentage point of GDP, to take the long-term tax-to-GDP ratio to 30%, is not out of kilter with NZ’s tax history, as the 40-year average shown above attests to.

Even bigger lifts than this would still not take things into “uncharted territory”. However, just as in the theoretical *Frozen Age Structure* scenario, the “no free lunch” warning applies here too, and it is more important because that scenario is impossible while raising taxes is not.

## 7.2 All tax increases are not equal - the type and size of the tax increase matters

Any raise in any tax type is likely to have some detrimental impact on economic growth. Taxes mean an individual or business does not receive the full return to their labour, production or investment. Consequently they provide a disincentive to the individual to work more; to the business to increase production; and to people and firms to invest their savings in the assets of a country, especially if there are lower-tax alternatives in other nations.

It is also true that the impact on growth is dependent not only on the size of the tax increase, but also on the tax type that is increased. For example, lifting personal income tax rates would likely retard growth, by discouraging labour participation, far more than would be the case if an equivalent amount of revenue was raised via the introduction of a land tax.

The tax section of the 2013 LTF Statement discusses the impacts of raising various tax types, taking into account factors such as the impacts on growth, the international mobility of their bases, equity issues, and the desire for NZ to retain a broad-based, low-rate tax regime.

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