Tales of Three Budgets: Changes in Long-term Fiscal Projections through the GFC and Beyond

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Abstract

This paper examines fiscal projections based on three consecutive budget forecasts (2009-2011) and provides cautionary insights as to how these projections only a year or two apart can lead to dramatic differences in projected debt levels in the future. Projections of net debt from a Budget 2011 forecast base are much lower, by 2050, than those for Budget 2009. This is largely due to the Budget 2011 forecast base having lower expenditure and higher revenue than the forecast base of the Budget 2009 projections. The paper also underscores how short-term policy changes, if sustained, can make a big difference over the long term and how, over time, the more fundamental structural factors such as demographics can prove to be more durable in influencing fiscal sustainability. Finally, it argues that, even though the level of debt-to-GDP shifts by mid-century, the messages we take from these projections remain the same: spending and possibly tax policies need to change, if we are to avoid passing debt that generates little social return onto our descendants, and early changes alleviate the need for more drastic revisions in the future.

Executive Summary

The Treasury has formally reported on projections of fiscal aggregates based on the 2006 Budget, the 2009 Budget, and recently the 2013 Budget forecasts. These projections use the budget forecasts as a base, and then apply official demographic and labour force projections, and growth and other parameters for revenue and spending, based on policy settings or historical values, to build up tracks of Gross Domestic Product (GDP) and public debt out to the mid-century. There are no policy responses built into these projections. Once the public accounts slip into deficit, debt-financing costs add to spending and debt accelerates away. These projections use bottom-up cost drivers and are called Cost Pressures projections in this paper.

The Global Financial Crisis (GFC) captured in the 2009 Budget projection and the subsequent slow recovery showing up in the following two budget projections provide a natural experiment about how five-year budget forecasts can wag the long tails of fiscal projections. They show the projections are very sensitive to the forecast base from which they arise. They also provide a case study of the effects of a shock on the long-term fiscal position: how quickly the buffer provided by low debt shrinks and how difficult and slow it is to bring the debt back down again.

The 2009 Budget projection has the full force of the GFC behind it. The public accounts start and remain in deficit as an ageing population drives up the costs of New Zealand Superannuation and public health, although in the case of the latter other factors also play significant roles. Because we assume no policy response, the gap is covered by borrowing and net debt grows to more than 200% of GDP by 2050.[1]

Using broadly the same demographic, economic and fiscal assumptions as for the 2009 Budget projection, we have constructed projections based on the following two budget forecasts. In the 2010 Budget projection, net debt grows to around 100% of GDP in 2050. This improvement in just a year comes largely from stronger revenue as a result of an improved economic outlook. In the 2011 Budget projection, the net debt projection halves to 44% of GDP in 2050. This improvement is due more to expense reductions from policy changes in the forecast base. Over time, the economy has improved, and policy changes reduce the number of years when the government accounts are in deficit. This means that net debt has fewer years to rise and compound. Despite the different levels, net debt reaches as a proportion of GDP, by the mid-century the net debt ratio is rising in all three projections.

The paper also uses the methodology of the fiscal strategy projections, where the Government's long-term fiscal ceiling for core Crown net debt of 20% of GDP is achieved by constraining the operating allowances. If we assume tax revenue is at historical ratios of GDP, we can then compare operating allowances which reproduce the Cost Pressures projections with the operating allowances producing these Constant Debt projections (at 20% of GDP). This shows the extent to which spending growth has to be constrained compared with historical rates.

These results have some major implications for policy makers and for the public, who are the ultimate recipients of publicly-funded goods and services. All else being equal – the

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[1] A fiscal year in New Zealand is the period from 1 July through to 30 June of the next calendar year. In this paper, fiscal years are labelled as the June year. For example, 2050 refers to the period from 1 July 2049 to 30 June 2050.

assumed tax settings, the assumed growth of demand-driven welfare spending and Superannuation, etc. – debt can be stabilised only by providing less of at least some services such as health, justice, education from the public purse in future.

The following are the lessons that we draw from this experiment of having different macro cyclical and policy changes in the forecast period and largely the same projection parameters and demography between budget years:

- Persistent excesses of spending over revenue (deficits) quickly create large problems.

- Even small differences in deficits have large effects over time, leading to volatility in projections from one year's budget forecast base to the next year's. The cumulative nature of these effects means it is better to address deficits sooner rather than later.

- The underlying change in population structure over time with relatively fewer workers and more (elderly) dependents means we are forced into some mix of higher tax per worker and lower spending per person to avoid persistent deficits.

- The difficulty of getting revenue and spending to line up in the face of population ageing places a premium on ensuring the best possible spending and the least damaging taxes.

- The percentage of GDP reached by net debt in some future year should not be the main focus of long-term fiscal projections. Any particularly value will largely be a product of the length of time that deficits have had to run unchecked. The direction of the debt-to-GDP track is the more important feature. If and when this track turns permanently upward, it is a signal that fiscal settings have become unsustainable and changes are needed to address this situation.

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1   Introduction

New Zealand, like many other OECD countries, has an ageing population. A population is ageing if the median age is rising, or the proportion of old in the total population is growing (see Section 3 for more details).

This produces a number of challenges, both fiscal[2] and economic.

Challenges on the fiscal side are:

- a rapidly increasing number of people eligible for New Zealand Superannuation (NZS), with the average recipient period lengthening

- pressures on health spending as an older population consumes more medical, surgical and residential-care services, and

- a potentially lower tax-to-GDP ratio, as the labour force decreases relative to population size.

Economic challenges include:

- a declining aggregate labour force participation rate

- reduced average hours worked as a higher percentage of the population stops working or moves to part-time work, and

- potentially slower growth, if these negative labour force factors are not offset by higher productivity or capital deepening.

New Zealand has periodically reported on the sustainability of the government's fiscal position, using projections based on an economic/demographic model of ageing with policy settings. Such an assessment requires a long-term perspective to capture the effects of population ageing. Our demographic structure is the most certain input into our projections, because most of that population is alive now. As such, it is something that we can make policy reforms for now. Announcing changes early gives people more time to adjust. Making these changes early also generally reduces the severity of later adjustments.

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[2]   We use the term "fiscal" to describe government finances, public spending and revenue, assets and liabilities such as debt.

Our approach to reporting has evolved from technical projections with little policy content, to including information about potential policy choices that would put debt on a more sustainable track and how these changes could affect various aspects of our living standards.

A sustainable track means that expenditure and revenue settings do not lead to substantial and sustained increases in government debt relative to GDP over the long term. If we reach a year where primary deficits[3] persist from that point onwards, the debt ratio will then rise faster and faster. At that point, compound interest takes over and produces accelerating debt growth which will be unsustainable, if the GDP growth rate is less than the interest rate. In other words, it's the deficit-to-GDP ratio that's important, not the deficit itself.

These results are sensitive to the state of the economy and fiscal policy settings at the start of the projections, and to assumptions about major drivers over the coming decades. In this paper, we illustrate this sensitivity by comparing projections arising from three consecutive budget forecast bases – 2009, 2010 and 2011 – and using assumptions drawn from New Zealand history. This provides a case study into how changes at the front have strong effects in later decades and shows that the issue is not the level of debt in a particular target year, but whether debt keeps rising as a ratio of GDP.

The above approach produces a debt track as a way of illustrating the pressures on the fiscal position from bottom-up drivers such as demographic ageing, wages and technology cost growth. Another approach to fiscal reporting is to select a suitable constant debt path, based on current government policy or on history (for example, net debt steady at 20% of GDP), and then examine how parameter settings for expenditure or revenue, or new spending and/or revenue initiatives would have to change from historical averages for debt to follow this path.

This paper was begun in 2011 and a draft version was presented at the New Zealand Association of Economists June 2011 conference. Referees provided comments at the end of 2011 and then the work was put aside while we produced the recently released long-term fiscal statement.

The paper has the following structure. After a discussion of the evolution of our approach to projecting and reporting the long-term fiscal position over the past six years and where we might head next, the paper briefly reviews in Section 3 the demographic projection and its underlying assumptions. We then turn to our economic and fiscal modelling approach and assumptions in Section 4. The core of the paper is Sections 5 and 6. These use the three budgets as a case study of the sensitivity of the long-term fiscal projections to the economic position and fiscal settings at the start. Section 6 shows what constraining debt in the 2011 projection might mean for operating allowances in the long term. The paper concludes with a section pulling together the lessons from the comparisons of the three projections based on the three recent budgets.

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3   The primary balance (surplus or deficit) is the operating balance with debt financing costs taken out of expenses and revenue received from assets excluded from the revenue side.

2   How our projection approach has evolved

Over the years, the Treasury has released economic and fiscal forecasts and projections that have taken an increasingly longer view of the consequences of budget decisions and current policy settings.

In this work, we distinguish between the terms "forecasts" and "projections." Forecasts are best shots of where the future is heading, usually made with a model designed to capture the key interactions taking place in the economy. As an example, the Treasury uses the New Zealand Treasury Model (NZTM), a general equilibrium macroeconomic model to produce its five-year economic forecasts (Ryan and Szeto, 2007). In contrast, projections are based on much simpler modelling using relatively few trend variables, few interactions, and including no policy responses. They are designed to answer "What if?" questions. In our longer-horizon modelling work, we use a five-year or so Budget forecast as the base from which to launch three-to-four decade projections.

Broadly speaking, we now have two different approaches to projections designed for two different purposes: one is used for the government's fiscal strategy and other for the Treasury's long-term fiscal projections. Both approaches use the same demographic and labour participation projections and long-term growth and inflation parameters. They both add the cost of financing debt to current spending. They both use the medium-term forecasts as a starting point, and the same approach to bring each of the major aggregate tax types to an historical average ratio to GDP within a few years of the start of the projections. And they both project transfer payments (such as welfare benefits and New Zealand Superannuation payments) in an identical manner: their growth takes the projected recipient numbers and average payment growth into account.

Where the two sets of projections differ is in the way they deal with all other programme operating spending (for example, on health and education, defence and administration). One set of projections (used in the Fiscal Strategy Model) starts from the forecast spending levels as a baseline. The only growth in (non-transfer) programme spending in the projections comes from the budgeted allowances. The levels of these are the result of political decisions and do not take demographic pressures into account, for example. In short, the bottom-up drivers are generally ignored for these categories of spending. How growth of potential demand would be accommodated in these allowances will await detailed budgeting decisions made in the budget preceding the financial year in question.

These fiscal-strategy projections generally extend out a decade beyond the end of the five-year forecasts and show how the choices made today might affect the fiscal position in the mid-2020s. They are used to inform the government's fiscal strategy; the projections show us the effects of continuing a constrained budget approach on spending, revenue and debt. These projections are less useful as an indicator of the sustainability of the fiscal position in the face of population ageing.

We are extending this approach to provide an alternative view of the longer-term projections in the Long-term Fiscal Model (LTFM), where the debt constraint arises from the use of constrained operating allowances over the 40-year horizon. This does not necessarily mean that, relative to GDP, the long-run operating allowances will be the same as those used in the fiscal-strategy projections, where, once net debt has begun to decrease, it normally continues on this trend. The long-run approach stabilises net debt to GDP, which will usually allow larger operating allowances than when net debt is being decreased.

The other approach (used in the LTFM) shows the effects of population ageing and other drivers on spending and revenue. The allowances are allocated to non-transfer spending categories in the forecast period using historical patterns. The end-of-forecast spending levels are then grown out using appropriate demographic, labour force and other historically derived growth parameters (bottom-up drivers). The LTFM is used to produce the projections in the long-term fiscal statements the Treasury is required to publish every three to four years. These projections tell us something about the effect of underlying demographic and other pressures on spending, revenue and debt.

Even with the same starting forecast and same ending projection year, these two sets of projections will generally produce different net debt paths by that year.

The differences in horizons, models, and macro-economic and fiscal inputs are summarised in Table 1.

Table 1 – Different projection horizons and models, Budget 2011

Horizon	←2010	2011-2015	2016-2025	2016-2050→
Period name	History	2011 Budget forecast	Fiscal strategy projections	Long-term projections (debt result/debt target)
Macro	SNZ	New Zealand Treasury Model	Fiscal Strategy Model	Long-term Fiscal Model
Fiscal	Treasury	Agencies' spending forecasts, Treasury tax forecasts, plus Gov't decisions on allowances	Fiscal Strategy Model uses Budget forecast plus allowances and fiscal strategy	Long-term Fiscal Model uses Budget forecast plus growth parameters based on history

Notes: All the years in this paper refer to the government financial year ending 30 June. SNZ is Statistics New Zealand. Long-term Projection (debt result/debt target) refers to the two ways of doing projections: one is the result of bottom-up assumptions which produces a debt track in the model (debt result); the other imposes a target debt track and changes spending, or revenue, or other parameters to achieve that debt.

Table 2 shows how our fiscal scenario language has changed: one where debt is the endogenous result of bottom-up drivers of spending and revenue and the other where core Crown net debt is constrained from the top down as a proportion of GDP (currently we use a 20% ratio). This has been achieved over the years by constraining different variables in the model and the names given to the two different approaches have varied over time.

Table 2 – Evolution of long-term fiscal scenario language

Budgets	Debt results from bottom-up drivers	Debt eventually held constant	How constant debt is achieved
2006	Bottom-up	Top-down	Constrained balance (expenditure or tax)
2009	Historic Trends	Sustainable Debt	Constrained real non-demo growth
2010-12	Cost Pressures	Constant Debt	Constrained spending allowances
2013	Resume Historic Cost Growth	Spending path that maintains 20% Net Debt	Constrained spending allowances

This paper uses both approaches, called here the Cost Pressures Scenario (in Section 5) and the Constant Debt Scenario (in Section 6) and uses a constrained operating allowance to produce the pre-ordained constant net debt ratio to GDP.

3   Population ageing

Population ageing shows up in the rise in the median age or the growing proportion of the old in the total population. This happens if fertility falls or life expectancy rises as a result of falling mortality rates. In New Zealand, and in many other nations, both of these demographic changes have occurred over recent decades. It also can happen when, as at present, people born in an earlier burst of fertility (the New Zealand post-war baby boom, roughly dated between 1946 and 1965) reach older ages.

Compared with all the policy uncertainty around future health, education, justice, welfare spending, and taxation, population projections are far more certain. People in the baby boom are now aged between their mid-40s and mid-60s. We have a good idea about how many will be alive over the next 40 or so years.

Figure 1 – Total fertility rate (period measure), 1950-2050
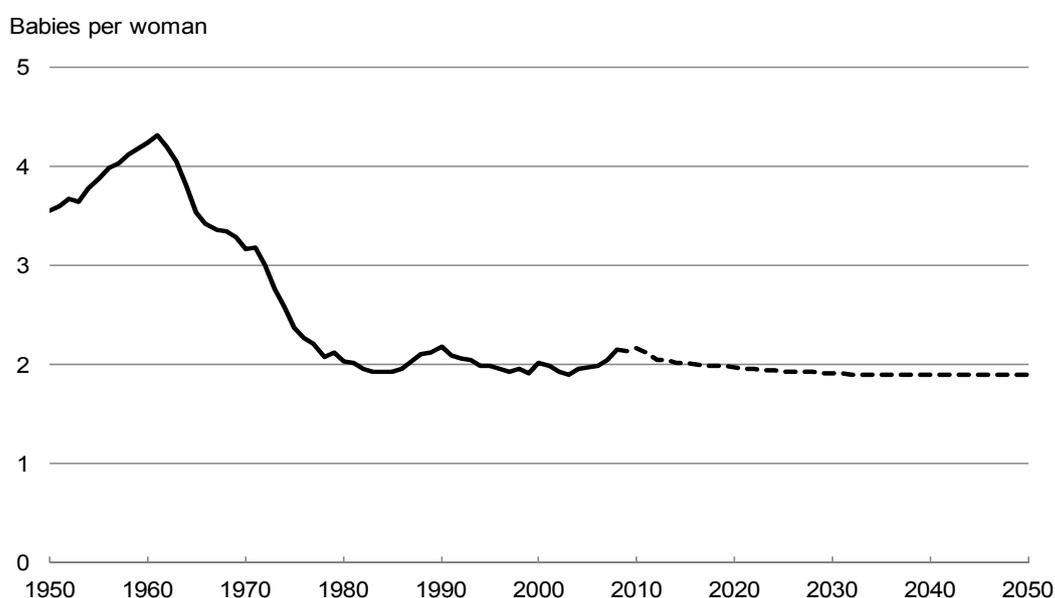
Source: Statistics New Zealand, 2009 (base) medium assumption, 2009

Note: The (period) total fertility rate is the average number of live births that a woman would have during her life, if she experiences the same age-specific fertility rates from that point onwards.

For their 2009 (base) deterministic demographic projections, Statistics New Zealand assumes that we will not see another large baby boom in the future, because social and economic conditions have completely changed from what prevailed in the two decades after the Second World War. SNZ assumes that fertility will settle back just a little from where we are now (at around the replacement rate of 2.1 children per woman). The long-term assumption is for 1.9 children per woman (for the medium assumption).

Mortality rates have been falling for decades and this fall shows up as rising life expectancy. Since 1950, life expectancy at birth (period measure) has risen by about 23 months (1.9 years) each decade. There is uncertainty about how far and fast mortality rates will continue to fall. SNZ assumes they will continue to fall and so life expectancy will continue to rise, but their medium assumption indicates a slowing of the growth rate to 2050 (to about 18 months per decade for males and 15 months for females). One issue about these medium life expectancy assumptions is that they may be too low and, if true, may be underestimating the fiscal costs of ageing.

Figure 2 – Life expectancy at birth, 1950-2050
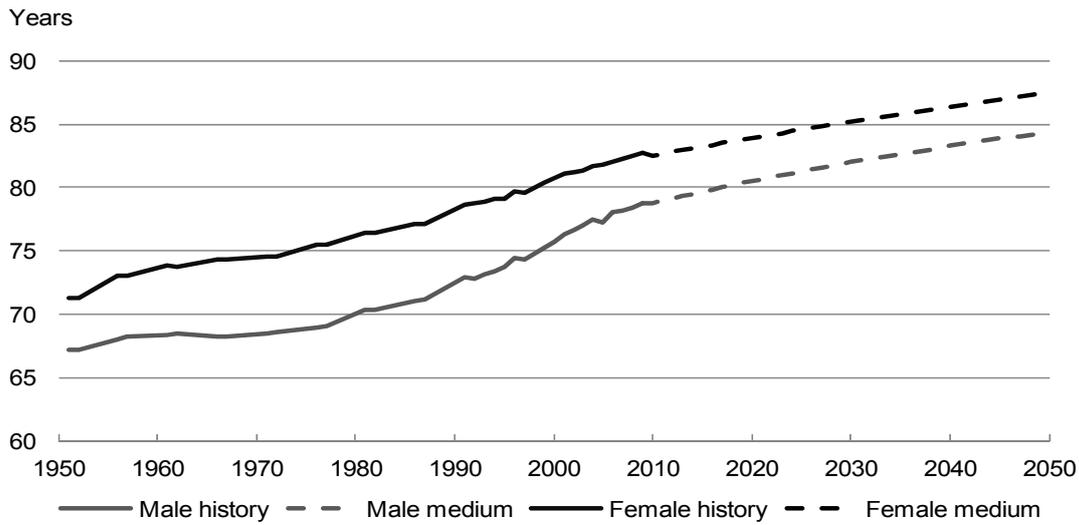
Years

Source: Statistics New Zealand, 2009 (base) medium assumption, 2009

Note: The life expectancy measure is derived historically from death rates in period life tables in census years. Life expectancy at birth in a year is the age to which someone born in that year could be expected to live on average if mortality did not change after that point. The base year for the projections is 2009.

The other key variable used in producing population projections is net migration. This has moved erratically up and down over the past half century, because of policy changes, the relative economic growth differences between New Zealand and the source and destination countries, and the numbers of returning Kiwis and families of former migrants.

Figure 3 – Net migration, 1950-2050

Thousands
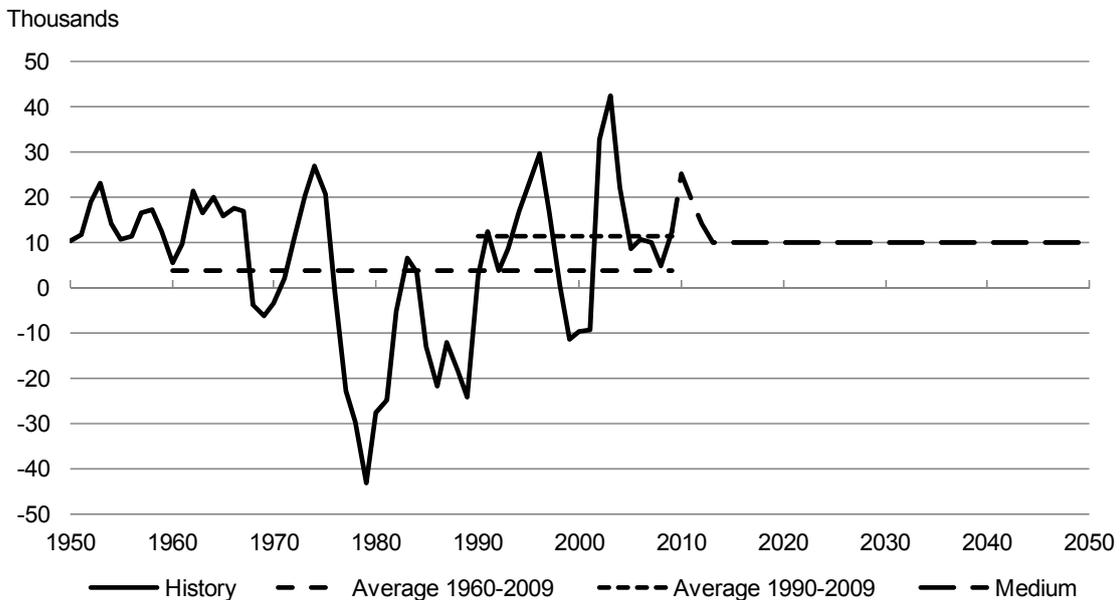
Source: Statistics New Zealand, 2009(base) medium assumption, 2009

Assumptions about levels of net migration probably do not have a major bearing on the ageing of the New Zealand population, as they are relatively small numbers with few older people migrating. If anything, persistently higher migration tends to reduce slightly the effects of ageing over the long term.

In 2009, Statistics New Zealand (SNZ) published nine official population projections using combinations of the three sets of input assumptions for the 2009 (base) projections. It is the medium projection (with three medium assumptions for long-term fertility, life expectancy and net migration, labelled by the agency as Series 5) that SNZ felt best represented our longer-term population prospects and that is what we use here as our base-case. Table 3 shows that, under this scenario, the population will grow by 30% over the period 2010 to 2050 and the ratio of those 65 and older to those 15-64 will double over this time.

Table 3 – Medium population projection (Series 5), assumptions and results

Medium (Series 5)	2009	2010	2020	2030	2040	2050
Assumptions						
Total fertility rate	2.14	2.16	1.91	1.90	1.90	1.90
e_0 male	78.8	78.8	80.5	82.0	83.3	84.4
e_0 female	82.7	82.5	83.9	85.2	86.4	87.5
Net migration	12.5	25.0	10.0	10.0	10.0	10.0
Results						
Population	4.32	4.37	4.78	5.12	5.38	5.58
ODR	18.0	18.2	24.1	31.6	36.4	37.3
Median age	36.5	36.8	38.1	40.2	41.8	42.6

Source: Statistics New Zealand, 2009 (base) medium assumption, 2009

Notes: 2009 is the base year for these projections (June years). The assumptions are: Total fertility rate, the number of children per woman if fertility stayed at that rate from that year onwards; e_0 is life expectancy at birth in years; Net migration in thousands. The results are: Population in millions; ODR is the old dependency ratio, the ratio of people 65 and older as a percentage of those 15-64; Median age is the population median age in years - half the population is older, and half younger, than this number.

This paper largely draws on the 2009 (base) deterministic projections.[4] SNZ also produced a very low mortality projection which has been seized upon by some groups interested in how far the medium case could be underestimating the effects on rising longevity. While these scenarios are useful in illustrating some kind of variance around the medium assumptions, they give no indication of their likelihood. For that, SNZ has more recently turned to providing stochastic projections.

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[4]   The 2009 Statement used a preliminary version of the 2009 (base) national population projections. For the 2010 Budget and the 2011 Budget projections, we use the 2009 (base) projections. In 2050, total population is 1.4% larger in the new projection than the old one and slightly older (ODR is 0.42 vs 0.37). In 2012, SNZ changed the way it presents population projections. It now publishes a deterministic 2011 (base) demographic projection, judged as most likely (median projection). By sampling from historically-derived distributions of assumptions (such as those for fertility, mortality, net migration) around the median assumptions, SNZ produces ways of measuring the likely distribution of various demographic measures around the median (Bascand, 2012).

4 Long-term fiscal modelling framework

This section provides a brief description of the Long-term Fiscal Model used to produce projections. Further detail is available in Bell, *et al.,* 2010. As noted in Section 2, the LTFM and its shorter-horizon cousin, the Fiscal Strategy Model (FSM), use the latest five-year update economic and fiscal (Budget) forecasts as the base for projections.

One of the strengths of the LTFM is that its structure follows that of the Budget documents, especially in regard to the fiscal data used. There is a Statement of Financial Performance section (the flows of revenue and expenses), a Statement of Financial Position section (balance sheet of stocks of assets and liabilities), etc., and specific areas of the model, such as the history, forecast and projection of the New Zealand Superannuation Fund use the same layout of the fund's components as the note on this topic in the Financial Statements does (see, for example, Treasury, 2011).

In regard to the main scenario projections of the LTFM, the Cost Pressures approach is what most countries around the world do to show the pressures of ageing on their projected fiscal position. The Constant Debt scenario shows the costs to other spending of leaving large parts of the budget (health and NZS, for example) unadjusted. Another strength (or it is a weakness?) is that we are assuming largely that the current spending patterns by age are the ones we will face over the coming decades (this comes from the idea that these projections are designed to show the consequences of current policy settings over the long term). It is a possible strength in that the projection is based on current settings, but it could also be a weakness in that these patterns evolve.

Another weakness is that at present we largely grow each category of spending from the values at the end of the forecast, at a level which may not be congruent with history. If they reach low levels, perhaps because of some fiscal consolidation programme, or the state of the economic cycle, then the projected spending track will be lower than it has been in history.

In the 2009 Statement, we provided some scenarios showing the effect of putting all the adjustment to achieve a Constant Debt scenario on the real amount of government services each person would receive if net debt were to stay around a level of 20% of GDP. The setting of a long-term net debt target of 20% of GDP for a Constant Debt scenario is somewhat arbitrary. It's a number that the government arrived at over time. A higher target would mean more spending or tax choices, but eventually more revenue would be paid those who had lent the government the money, resulting in a greater transfer of wealth from future taxpayers to bond holders. (This doesn't rule out the fact that some spending on productive infrastructure, for example, could well generate future tax revenue and mean a reduced wealth transfer from future taxpayers to bond holders.)

4.1 How we project nominal GDP

The macroeconomic forecast aims to reach annual productivity growth of 1.5% by the last year of the five-year forecast where it is assumed to remain to the end of the projection. When the potential gap cannot be closed in the five years (such as when the economy is coming from a particularly strong peak or trough), the LTFM uses a few further years of gradual transition to bring annual labour productivity growth to this long-run assumption.

The LTFM (and the FSM) uses the PPP framework to project GDP. From the demographic projection (population is the first P in the PPP), we derive a projected working age population (15 and older). To this we apply five-year age group labour force participation rate projections (participation is the second P), derived from SNZ's latest projection to arrive at a projection of the labour force.

For many of the 5-year, prime-age groups, participation rates are fairly high and stable through time. However, participation by older age groups (55 and older and particularly older women) is expected to rise. SNZ expects about 50% of people between 65 and 69 will be in the labour force by 2020. Because of population ageing and lower, though rising, participation in older groups, the overall participation rate is projected to fall, pointing to a slowing of labour force growth.

The employed section of the projected labour force in year t is calculated by multiplying the labour force by $(1 - u_t)$, where u_t is the unemployment rate. This employed labour projection is then multiplied by the average hours worked (derived from history) to get a projection of total hours worked in the economy.

The projection of both real and nominal GDP is done on a growth, rather than levels, basis. In other words, the value in any projected year is calculated by growing it from the value in the previous year, with this projection starting from the last forecast year of each GDP variable. For real GDP, the growth of the total hours worked in the economy, whose calculation has been described above, is multiplied by an average growth rate of output per hour (productivity, the third P, is assumed to reach a steady 1.5% a year, based on a view of history and with some convergence to our major trading partners' growth). For nominal GDP, the projected growth of real GDP is augmented by projected inflation for the year. The long-run inflation assumption is the current mid-band policy rate of 2% a year.

There are several strengths and weaknesses in this approach to projecting GDP. A strength is its simplicity. It also broadly captures the effects of an ageing population through the labour market. Weaknesses include lack of feedback from government policy changes such as tax reforms or investment spending.

In addition, because much of the discussion about the effects of policy change on behaviour revolves around labour participation of older people, we see a need to break out the 65 and older group into three (or more) separate age groups (for example, 65-69, 70-74 and 75 and older), and to have a similarly detailed break-out of hours worked and productivity growth by age, but the latter two break-outs are not used here.

4.2   How we project spending

On the fiscal side, expenditure on government programmes is modelled in two ways: one for transfers and the other for all other programme spending. This description deals with the core Crown part of government (excluding Crown entities and state-owned enterprises): the model also projects series of the total Crown including these entities.

Growth of spending on transfers (such as welfare benefits or NZS) is the sum of a payment rate indexation factor, and the growth of the number of recipients, disaggregated into age and gender groups. In the case of NZS, the base-case uses the current policy settings: the annual payments grow by CPI inflation, provided the combined payment for a

couple is between 66% and 72.5% of the net average nominal wage,[5] otherwise, it grows at the same rate as the net wage. For the projection period, even if NZS rates are not on the wage floor by the end of the forecast, they will eventually reach this because in projected years consumer prices and wages maintain their relativity, Once they do, NZS payments grow with the average wage. Recipient numbers grow with the numbers of people 65 and older. All welfare benefits are assumed to grow by CPI inflation.[6]

Population ageing shows up in the number of years a person receives the public pension. A person in 1950 could expect to live for 14 years on average after turning 65. This has risen to about 22 years now and could rise to 27 years by 2060.[7] The number of people receiving NZS under present settings will grow between now and 2050 by a factor of 2.3 times. The three effects – population growth, rising longevity and payments growing with average wage growth – mean the cost of NZS grows from 4.4% of GDP now to 7.5% in 2050.

All other spending (on areas such as health, education, justice, transport, administration, etc.) is more complicated, as growth often depends on political decisions each year. To capture this, we use growth parameters calibrated from history. Here growth in spending in an area is the sum of "price" growth and "quantity" growth. "Price" growth depends on inflation, π_t, a real growth factor such as wage or economy-wide productivity growth, w_t, calibrated at 1.5% a year, offset by public sector productivity growth, a_t, calibrated at an average 0.3% across all other spending areas. The more productive a public sector area is (higher a_t), the more overall costs are offset and more services available for the same cost. "Quantity" growth depends on growth of the numbers of recipients, perhaps weighted by age, d_t, and the growth in the quantity of real services received on average by each person, p_t, calibrated from history at 0.8% a year for all services.[8] The generic formula (derived in Bell, *et al.*, 2010) for nominal spending growth, g_t, from year *t-1* to year *t,* is:

$$g_t = (1 + \pi_t)\frac{(1 + w_t)}{(1 + a_t)}(1 + d_t)(1 + p_t) - 1 \tag{1}$$

Or in linear form, nominal spending growth equals general price inflation plus real wage (real cost) growth less sectoral productivity growth plus demographic growth plus growth of amount of services received by each person:

$$g_t \approx \pi_t + w_t - a_t + d_t + p_t \tag{2}$$

This linearised form is used to estimate parameters from historical spending data.

In the model, each spending area has its own peculiarities. Health, for example, has five service groups, each with its own cost weights, by five-year age groups, and by gender. The cost weights for each service, by age and gender, for the three Budget projection are held at 2010 levels for every projected year in constructing the d_t factors (in the 2013 projections, these costs weights are assumed to shift down for older people each year – an assumption of healthy ageing).

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5   The 66% wage floor results from a policy decision by the National-led Government. The law states the payment for a couple must lie between 65% and 72.5%.
6   For the 2013 Statement, we have assumed some of the supplementary benefits, such as accommodation supplement payments, grow faster than CPI inflation (Treasury, 2013).
7   Statistics New Zealand, "How long will I live?" These are based on cohort live expectancy and take into account rising life expectancy over time. http://www.stats.govt.nz/browse_for_stats/health/life_expectancy/how-long-will-I-live.aspx
8   This assumption was changed in Treasury (2013) to 1.5% growth for health and 1% growth for education.

4.3　How we project tax revenue

Three[9] major tax groupings are modelled in the projections: source deductions, corporate tax and all other taxes. Source deductions tax is New Zealand's single biggest source of tax revenue, and around 80% of it is derived as PAYE on salaries and wages. Corporate tax is dominated by company tax. GST is responsible for nearly half of the other taxes category, which also includes excises and customs duty and a number of smaller tax types.

The upward turn in each track (Figure 4), roughly at the same time around the middle of the 2020s, is heavily influenced by ceasing fiscal-drag modelling and gradually returning source deductions to a long-term average GDP ratio.[10]
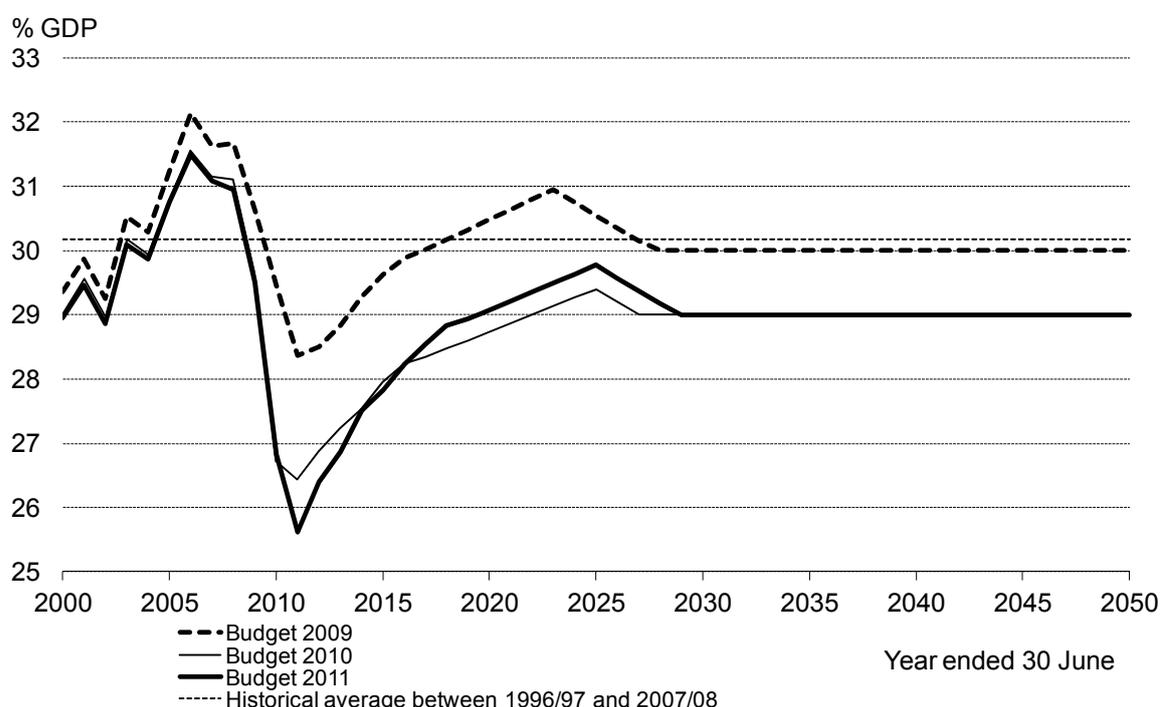
Figure 4 – Core Crown tax revenue to GDP

Figure 4 shows the three budgets' long-term projections of core Crown tax revenue, as well as the historical average ratio to nominal GDP, between 1997[11] and 2008, of 30.2%.

For both corporate tax and other taxes, the projection technique uses targeted ratios to nominal GDP. They build towards these ratios from their end-of-forecast values at assumed annual transition rates, and then remain at them for the rest of the projection. The ratios are based on long-term historical averages, but allowance is made for policy change that would alter these. For example, the long-term ratio for the other taxes group

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[9]　The 2013 version of the model actually uses five major classes, as other taxes has now been split into GST, hypothecated transport taxes (which fund transport spending) and all remaining tax types. The logic of bringing every category to long-run percentages of GDP is still applied, so use of five tax categories has not altered the general approach used in Budget 2011.

[10]　In a tax system with multiple tax thresholds, as taxable incomes increase, tax revenues increase more than proportionately. This occurs because a higher proportion of an individual's income is taxed at a higher rate as their income increases. This additional increase in taxes is known as "fiscal drag" because it has the effect of removing aggregate demand from the economy. Reasons for turning fiscal drag off are explained later in this section. Source deductions are the taxes withheld on salaries and wages, some welfare benefits, NZS, and superannuation fund contributions.

[11]　Tax data prior to 1997 have not been back-dated to reflect the International Financial Reporting Standards (IFRS) accounting framework applied to the NZ government accounts. Consequently, using data from before this in the averaging period would mean mixing tax revenues assessed under different standards in that average, as well as comparing these earlier levels of tax to future tax flows that do not reflect the same measurement technique.

was lifted when the tax changes in Budget 2010 raised the GST rate from 12.5% to 15%. At the same time, some offsetting reductions in the long-term source deductions ratio were also made, as the same budget delivered personal tax cuts.

This targeted-GDP-ratio technique means that cyclical variations in tax, which will be incorporated in the forecast base, are not carried out into the entire projection horizon. The GFC impact is a prime example. All three budget projections examined in this paper still had, to varying degrees, less than normal tax-to-GDP ratios by their forecast ends. If the tax projections had simply launched from these values, corporate tax and other taxes would have retained these cyclical downturn effects over the projection.

The Budget 2009 projection targets 30% of nominal GDP which, to the nearest half percentage point, reflects the historical average. An obvious question is, "Why do the two later budget projections target a value that is one percentage point of GDP lower?"

As already noted, Budget 2010 included a tax package which cut personal tax rates and raised the GST rate. The Treasury estimated that, by a decade after its introduction, the growth effect of the tax package would be to raise the level of real (constant price) GDP by 0.9%. That equated to a lift of around 3% in nominal GDP, but this wedge between the lift in real and nominal GDP is because the latter is an expenditure-based measure that includes GST in the prices used to construct it. This effect is not due to economic activity that will produce more tax and the increased GST is already factored into tax revenue projections. Hence the long-term tax-to-nominal GDP target needed to be reduced, and the Treasury's estimate was that a 1 percentage point reduction was appropriate.

The lift above the long-term ratio, whether 30% in Budget 2009 or 29% in later budgets, is due to incorporating fiscal drag modelling in the initial years of source deductions projections. As this is personal income tax and the New Zealand personal tax regime has four income thresholds with higher tax rates above each, it is subject to fiscal drag.

Estimates of the fiscal drag impact are applied in forecasting source deductions, and they are carried out into projections for a further decade. The main reason for extending fiscal drag modelling beyond the end of the forecast base is that projections reflect current policy, which includes the existing personal tax regime. Without changes to this, fiscal drag would be expected to continue. However, this principle has to be applied while both reflecting the history of tax policy and applying common sense.

Since GST was introduced in 1986, major personal tax cuts have occurred around once every 10 years. There was a two-round reduction in 1996 and 1998 and then the next big cuts were not seen until 2008. Further relatively large reductions followed these in Budget 2010, which bucks the decade-gapping trend somewhat.

The common-sense aspect simply reflects that, even those on the lowest incomes, such as beneficiaries, would be facing the second highest (in some cases possibly even the highest) marginal tax rate by 2050, if no personal tax reductions were assumed over the projection horizon.

Consequently, source deductions tax is brought back to a long-term ratio of GDP after a decade of projections. This usually means reducing it from whatever ratio it has been lifted to by fiscal-drag modelling. This reduction occurred to various degrees in all three Budget projections examined here, with the most pronounced in Budget 2011.

# 5 Long-term fiscal projections from three consecutive budgets

This section analyses the causes of the lowering the net debt ratio to GDP in each of the two budget projections after the 2009 Budget. It all comes down to the state of the forecast base from which they arise. The first reduction (between the 2009 and 2010 Budget projections) is mainly due to stronger revenue from an improved economic outlook. The second reduction (between the 2010 projection and that from a 2011 Budget base) owes more to expense reductions from policy changes contained in the forecasts from which the projections stem. Differences in balances in the forecast base are then amplified in the projections. The longer the period of continuous deficits lasts, the greater is the rise in net debt (accelerated by rising debt-financing costs).

The three projections analysed in this paper use the three *Budget Economic and Fiscal Update* forecasts as their bases (Treasury 2009a, 2010, 2011).

Challenges and Choices (Treasury, 2009b) uses a 2009 Budget forecast base, which was heavily influenced by the onset of the global financial crisis (GFC). This produced a grim warning about New Zealand's potential future fiscal path. Under the bottom-up Cost Pressures scenario, net core Crown debt rose to 223% of GDP by 2050.

We updated long-term projections using the 2010 and 2011 Budget forecasts. The Cost Pressures projection approach applied to these Budget forecasts is very similar to the approach used in 2009. Despite this, the resulting levels of net debt to GDP reached by 2050 are quite different (Figure 5).

Figure 5 – Net core Crown debt to GDP
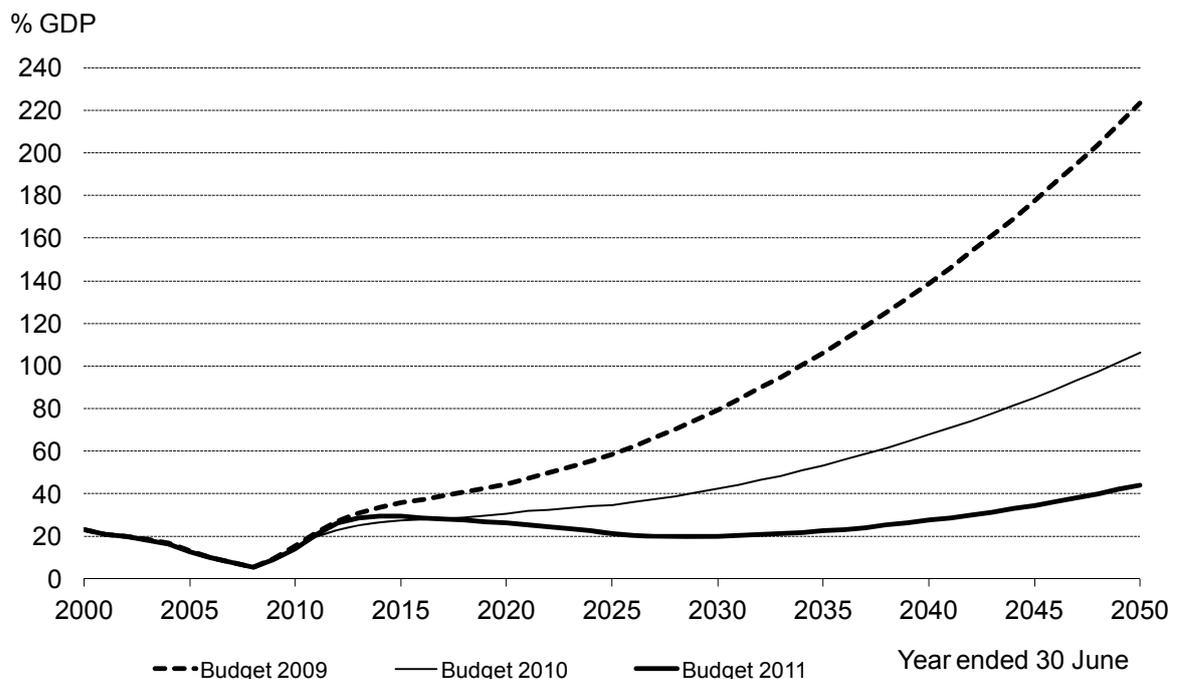
The Budget 2010 projection for net debt climbs to 106% of GDP in 2050, and is on an upward trend at that point, while the Budget 2011 projection has net core Crown debt at 44% of GDP in 2050, and rising. The net debt to GDP ratios halved at the end of the projection period from the 2009 to the 2010 updates and from the 2010 to the 2011 updates, although the upward trend at the end of the projection period is a common feature of all three projections.

These findings raise the question whether fiscal adjustments adopted by the Government in these three budgets have been enough to address New Zealand's long term fiscal challenges fully. This paper argues that a sustainable fiscal position will require on-going policy responses.

At this point, a casual reader might draw two conclusions from Figure 5:

- The methodology behind these projections is flawed, error-ridden, or based on dubious assumptions, and

- The 2011 projection shows that any problems with New Zealand's long-term fiscal position are so far into the future as to require no current policy responses.

Both conclusions, as this paper hopes to demonstrate, would be incorrect.

5.1 Constructing Cost Pressures and Constant Debt projections

The Cost Pressures projection should not be viewed as a forecast of New Zealand's likely future fiscal position. It assumes no policy responses, and so provides an indication of the trend towards which current policies are leading.

As such, it is a warning message: "If nothing changes, New Zealand's future fiscal position will become unsustainable." It also delivers a message that early, gradual change is desirable. This will make the transition to a sustainable future much easier than the severe cuts that will be required, if current policy settings are left in place until they simply become untenable.

Will net debt be allowed to rise to over 200% of GDP by 2050, as the Budget 2009 Cost Pressures projection suggests? Of course not – it is unlikely that even the 44% ratio of the 2011 Budget projection would be allowed to occur. Governments of the future would cut spending, raise taxes or possibly do both to avoid such situations.

The past quarter century shows that New Zealand policy-makers do not allow public debt to rise unchecked. Successive governments reduced gross sovereign-issued debt from over 75% of GDP in 1987 to 20% by 2008. The current government is doing the same in response to the lift in debt caused by the GFC. We will see that policy changes have played a big role in reducing the net debt track between Budget 2009 and Budget 2011.

These Cost Pressures projections assume no policy responses, so when primary deficits start and debt financing costs start to grow, there is nothing in place to stop them. As a result, the net debt curves then rise at an accelerating rate.

Cost Pressures projections produce various forms of revenue, expenditure, assets and non-debt liabilities, and the path of gross debt results from bringing these together via the accounting identity (3) below linking the statement of financial performance and the balance sheet (Δ variable signifies the annual change in the variable):

$$\Delta \text{ net worth = operating balance} \tag{3}$$

where

net worth = assets – liabilities

= assets – (gross debt + non-debt liabilities).

Hence,

$$\Delta \text{ gross debt } = \Delta \text{ assets} - \Delta \text{ non-debt liabilities – operating balance.} \tag{4}$$

As net debt is derived from gross debt by removing a specified subset of financial assets,[12] this relationship could be expressed as:

$$
\begin{aligned}
\Delta \text{ net debt } &= (\Delta \text{ assets} - \Delta \text{ a subset of financial assets}) \\
&\quad - \Delta \text{ non-debt liabilities – operating balance} \\
&= \Delta \text{ assets that add to net debt} \\
&\quad - \Delta \text{ non-debt liabilities – operating balance.}
\end{aligned} \tag{5}
$$

The core Crown operating balance can be expanded into its main components of:

$$
\begin{aligned}
\text{operating balance} &= \text{tax revenue + other non-investment revenue} \\
&\quad + \text{investment revenue and unrealised gains/(losses)} \\
&\quad - \text{non-debt financing expenses – debt-financing costs.}
\end{aligned} \tag{6}
$$

Other non-investment revenue is income from sales of goods and services plus fees, fines and levies. Non-debt financing expenses are spending on the provision of publicly-funded goods and services, such as health, education, welfare, justice, defence, core government services, economic/industrial services and several other classifications.

Making debt the key calculated aggregate is not the only way of modelling fiscal projections. Later in the paper, we construct a projection where the net debt path remains constant at 20% of GDP (the current Government's medium-term debt ceiling). In other words, net debt is pre-set or exogenised in the Constant Debt approach. Because some variable has to act as the end point of the modelling, in order to close the relation shown in (3), we constrain the non-debt financing expenses that are grown via an operating allowance (new non-welfare spending) in a budget process.

We rearrange the identity so that we can calculate the operating allowance required to meet the pre-set net debt value:

$$
\begin{aligned}
\text{Operating allowance-covered expenses} & \\
&= \Delta \text{ net debt} + \Delta \text{ non-debt liabilities} \\
&\quad - \Delta \text{ assets that add to net debt – welfare expenses – debt-financing costs} \\
&\quad + \text{tax revenue + other non-investment revenue} \\
&\quad + \text{investment revenue and unrealised gains/(losses).}
\end{aligned} \tag{7}
$$

---

[12] Annex 1 of the *2009 Fiscal Strategy Report* (English, 2009) defines the current net debt indicator as gross debt less all financial assets excluding advances and the NZ Superannuation Fund. Advances such as student loans are excluded as being less liquid and NZSF is excluded because those financial assets are held for a specific policy purpose (future payments of retirement income).

5.2   What's the same between Budgets 2009 and 2011?

Before examining the main factors that have caused the long-term net-debt projections to alter so radically over the last three budgets, we rule out factors in this section that have made little difference. This will help to focus on the areas to which these projections are most sensitive.

Both the growth of core Crown assets and the growth non-debt liabilities have not changed net debt much in the three consecutive budget projections. That is most easily communicated graphically, but the figures need some explanation.

Figure 6 shows just the contribution of asset growth to the net debt projections. It starts from a common net debt level, the value in 2008, which was a known, historical fiscal year for all three projections.

To produce projections, both the change in the non-debt liabilities and the operating balance are treated as if they were both zero in all three budget projections (see equation (5) above). Obviously, neither the annual change in non-debt liabilities nor each year's operating balance is actually zero. However, their impacts, or at least the impacts of their major components in the case of the operating balance, are depicted in later figures. The purpose of isolating the contribution of asset growth to each of the three budgets' net debt projections is to show how much, or how little, it accounts for the differences.

Figure 6 – Contribution of asset growth to net core Crown debt
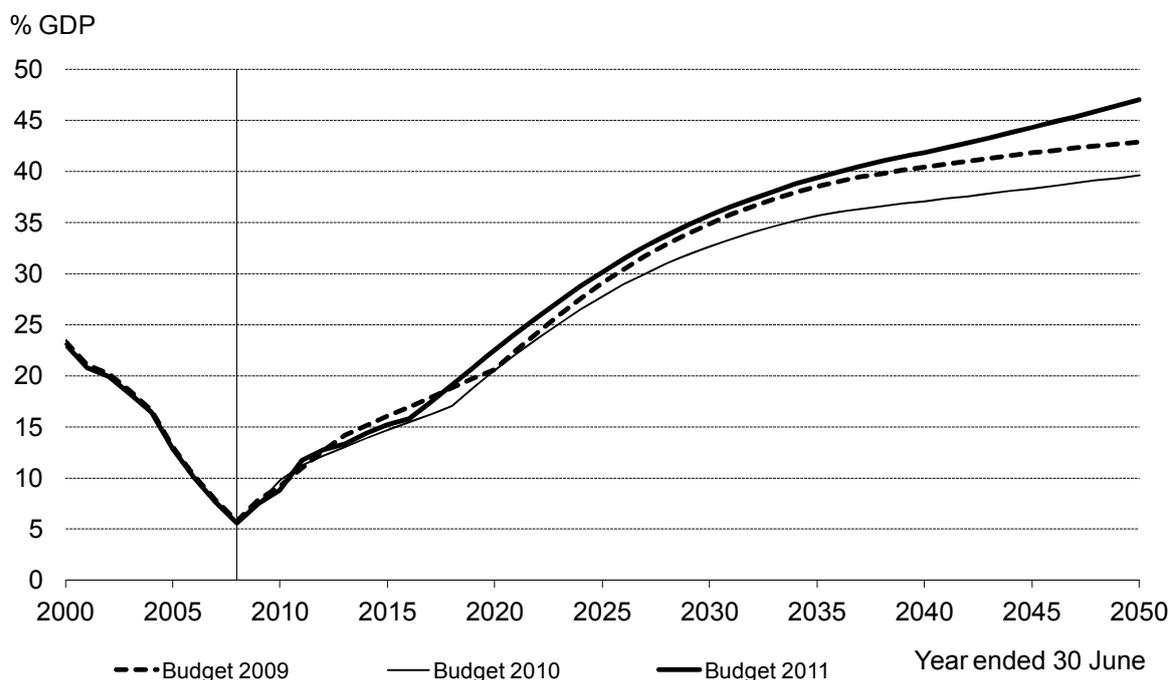
Figure 6 shows that, by 2050, the Budget 2011 asset forecast base and ensuing growth has added around 7 percentage points of GDP to its net debt track relative to that of Budget 2010, with the Budget 2009 impact falling approximately midway between the two. In light of the overall differences in the net debt to GDP tracks illustrated in Figure 5, this indicates two things. First, as the Budget 2011 net debt track was the lowest of the three and Figure 6 indicates that asset growth changes have actually raised it more than for the other two Budget tracks, other factors must have had to offset the rise of net debt in this projection even more. Second, while asset growth differences have lowered the Budget

2010 net debt track relative to that of Budget 2009, by 2050 they have only contributed 3 to 4 percentage points of GDP to a difference of over 110 percentage points. Figure 6 illustrates that the asset forecast bases and asset growth projections of the three budgets are not significant contributors to their net debt path differences.

Figure 7 – Contribution of non-debt liability growth to net core Crown debt
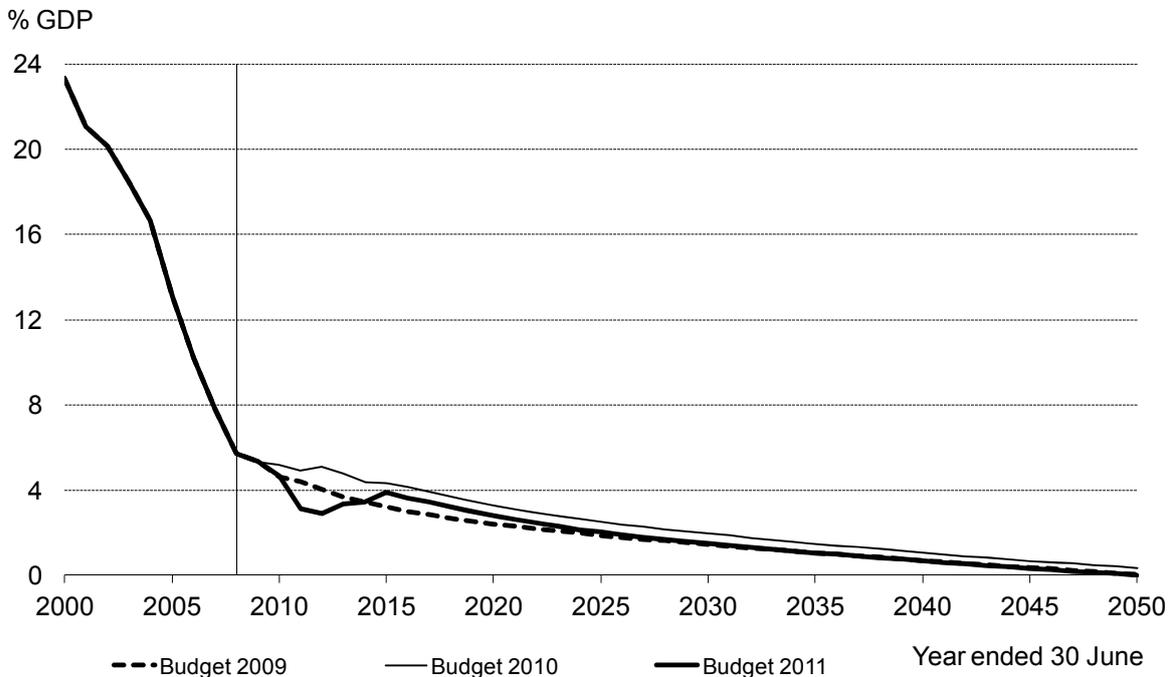
% GDP

Figure 7 deals with the contributions of projections of non-debt liabilities to the different net debt tracks. Non-debt liabilities include insurance liabilities, state service retirement plans like the Government Superannuation Fund, and Emission Trading Scheme provisions. Growth in non-debt liabilities limits the growth in gross debt, and hence net debt, as these liabilities cover potential expenses that may otherwise have to be met from increased borrowings. As Figure 7 illustrates, the contributions of the non-debt liabilities projections of the three Budgets to their respective net debt tracks are similar, and hence non-debt liabilities contributions to net debt track differences are very small.

5.3   What drives differences in projected debt tracks?

The answer to the question in the title of this section is that it is the timing of when persistent deficits begin. These determine the impact on net debt, via both how large the primary deficits themselves are and how big the ensuing debt financing costs they produce are, up to the arbitrary end point of these projections, 2050.

Figure 8 shows the impact of each budget's primary balance on its net debt track. The upward turn in each track is heavily influenced by stopping fiscal drag and gradually returning source deductions to a long-term average GDP ratio.

The other point highlighted by Figure 8, and probably more important in the context of the net debt projections arising from the three budgets' forecast bases, is that, unlike the growth of assets and non-debt liabilities, there are clear and significant differences in how each budget's primary balance track has affected the net debt tracks.

Figure 8 – Net core Crown debt to GDP – primary balance contribution
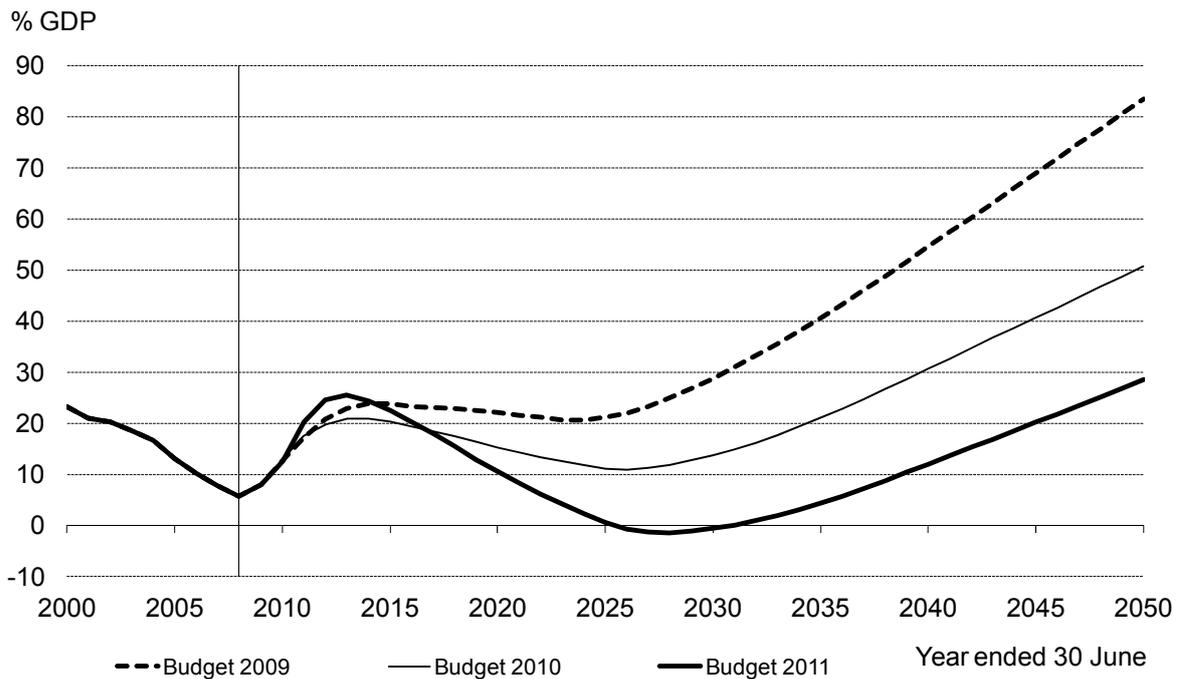
Figure 9, showing the primary balance tracks themselves, may help to clarify points in the following discussion.

Figure 9 – Core Crown primary balance to GDP – three budget projections
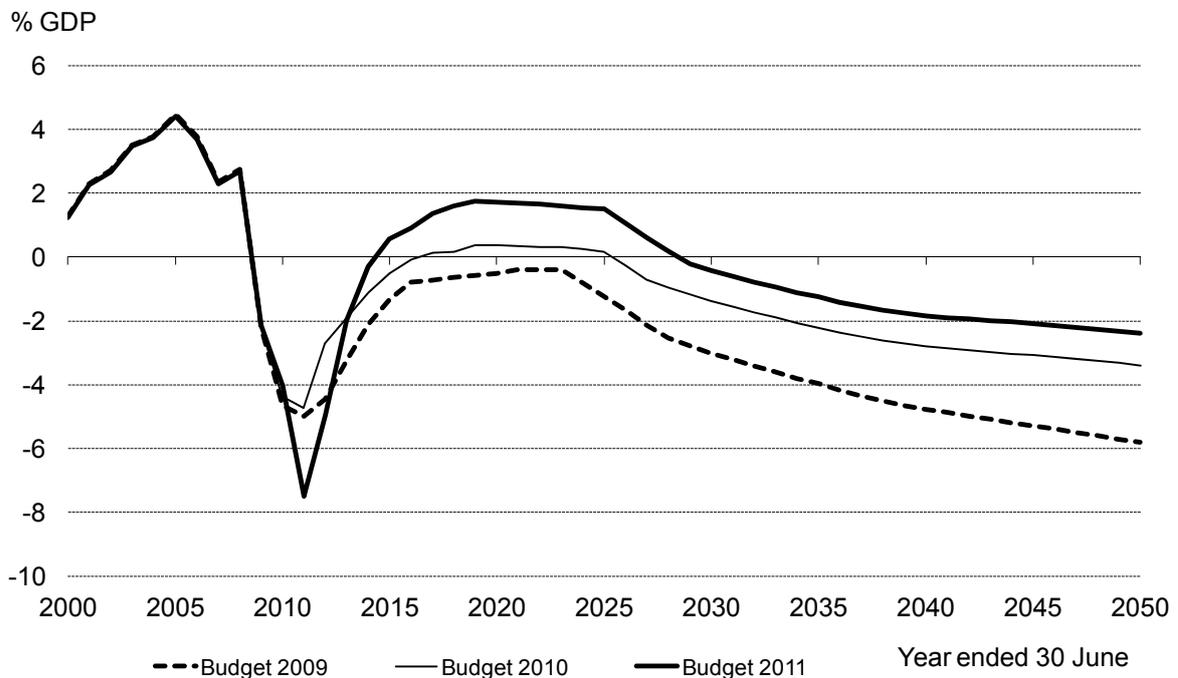
For Budget 2009, there is a very small negative effect from the primary balance on net debt from around 2013 to 2023, when the deficits of the forecast base recover somewhat. This occurs when tax revenue was expected to be recovering from the negative impacts of the GFC, and also growing because of fiscal drag. Once tax has stabilised, the ongoing growth of expenses, especially NZS whose recipient growth is high in this period, causes

primary deficits to increase again. The growing deficits add over 60 percentage points of GDP to net core Crown debt over the remaining 25 years or so of the projections.

The Budget 2010 story is largely similar to that of Budget 2009, except the impacts are more muted. Unlike simply reducing the primary balance deficits for a decade or so beyond the forecast base, small surpluses are actually run over most of this period. This helps to reduce net debt by around 10 percentage points of GDP. Once tax stabilises, however, the growth of non-debt financing expenses again drives them past the combined revenue from taxes and other non-investment income. After this, primary surpluses quickly turn to deficits and start lifting net debt again. But the primary deficits remain 1.4 percentage points of GDP or more above those of Budget 2009. As a consequence, the cumulative impact on net debt is only a little greater than half of the rise seen for Budget 2009 over the same 25 years.

Finally, the Budget 2011 primary balance projection is yet another step up, although the eventual fall into deficits still occurs. Surpluses are achieved more quickly, from a worse position than either of the other budgets in 2010, and rise to over 1.7% of GDP by 2020. Before the familiar decline into primary deficits begins around 2025, as source deductions are brought back to assumed long-term GDP ratios, the cumulative impact of primary surpluses has reduced net debt by over 25 percentage points of GDP. Again, even after primary deficits set in, they stay around 1 percentage point of GDP above those of Budget 2010 and so do not lift net debt as much.

Figure 10 – Core Crown tax and other revenue – three budget projections
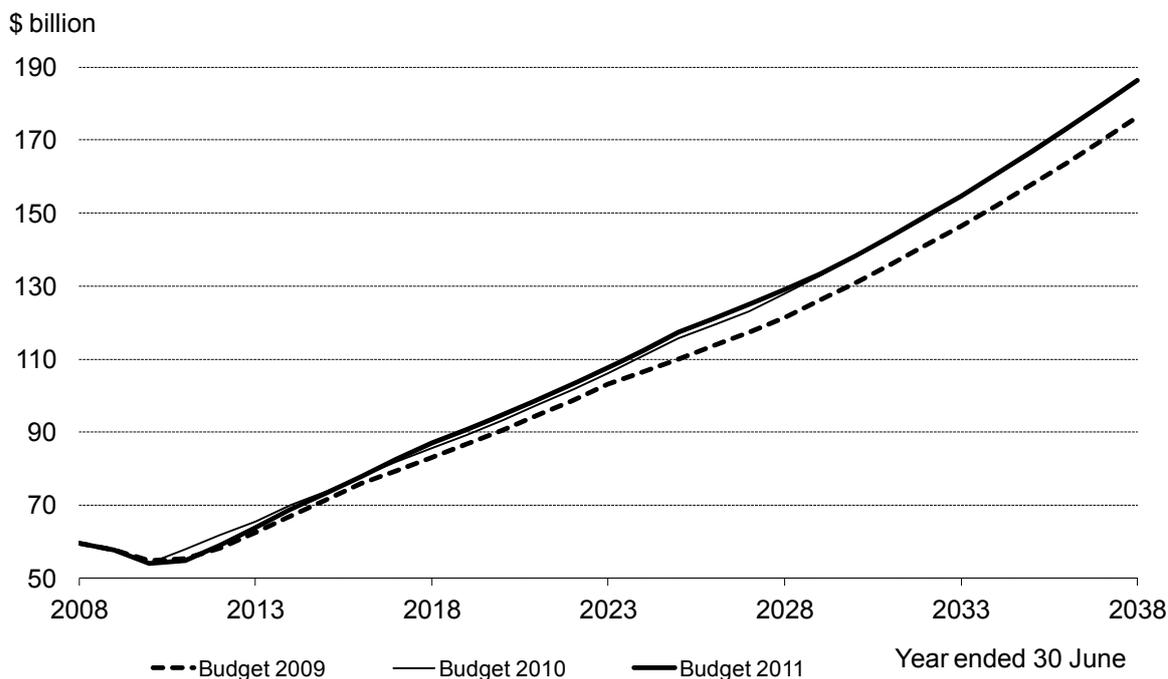
That explains how the respective primary balance tracks impact on net debt, but it does not fully explain why the primary balance tracks themselves get stronger from budget to budget. Interestingly, the reasons are different in moving from Budget 2009 to Budget 2010 and then on to Budget 2011. The first transition is mainly due to stronger revenue from an improved economic outlook. The second owes more to expense reductions from policy changes in the forecast base.

Normally fiscal projections over a long-term horizon are shown as ratios of nominal GDP, rather than in nominal dollar values. This is because comparisons between dollar values many years apart are eroded by the impact of inflation. However, what matters in moving from surplus to deficit are the nominal revenue and expense levels. Two projections of tax revenue could assume the same long-run ratio to GDP, but if one involves a higher GDP track, that equates to more dollars available to cover expenses.

Figure 10 shows revenue projections for the three budgets in nominal dollars. The graph stops in 2038 in order not to swamp differences in the range of dollars covered, but the relationships between the tracks are clear by this time. The Budget 2010 and 2011 revenue tracks are so close that they can hardly be distinguished. The Budget 2009 track is lower, although as a percentage of GDP it is this track that is the highest of the three. By 2050, core Crown revenue is 30.8% of GDP in the Budget 2009 track and only 29.7% in the other two budget tracks. However, in actual dollar terms, not only are the later two budget tracks virtually the same, but they are nearly $20 billion, or over 7%, higher than the $273 billion value attained by the Budget 2009 track in this year.

The revenue track is dominated by tax, and tax is driven by its ratio to nominal GDP. Despite some differences in their forecast bases, the GDP tracks for Budget 2010 and 2011 are quite similar over the projection horizon. Hence, it is not surprising that the two revenue tracks align closely. Budget 2009 is a different story. Produced as the impacts of the GFC were being strongly felt and with much uncertainty about how things would develop, not just in New Zealand but also around the world, forecasts of economic growth were understandably subdued. Later GDP forecasts were more optimistic, as economic and fiscal data showed New Zealand was faring better than Budget 2009 had predicted. Another factor boosting later budget forecasts was an upward revision by SNZ of over $3 billion (nearly 2%) in the 2008 nominal GDP base from which the Budget 2009 forecasts launched. And yet a third factor was the Budget 2010 tax cuts, which are expected to have some growth-enhancing impacts on the NZ economy. Hence there were estimates of these built into the later forecast years and the first few years of projections.

As a consequence of these factors, the GDP projection at Budget 2009 was weaker than that of the later two budget projections. The growth of the Budget 2009 nominal GDP track did not differ greatly from that of the later budgets, once long-term stable assumptions around labour productivity, unemployment rate, inflation and so on were reached in projected years. However, that means the nominal GDP values continue to move apart and with them the nominal tax revenue that is pegged to them as a constant ratio. This explains why the gap in the revenue projection between Budget 2009 and the later two budgets continues to grow slightly across the projections.

Figure 11 shows projections, for the three budgets, of core Crown aggregate expenses excluding debt-financing costs, in nominal dollars. Again, in order to keep differences discernible, the graph only goes out as far as 2038, but, as with revenue, the positions of the three tracks in relation to each other are evident by this year. Unlike for the revenue projections, the substantial differences in the tracks portrayed in Figure 11 occur between Budgets 2010 and 2011, with the Budget 2009 track being very similar to that of Budget 2010. The lowering of expenses between Budgets 2010 and 2011 is more a story of policy decisions than it is of the stronger economic outlook that was behind the rise of the revenue track between Budgets 2009 and 2010.

Figure 11 – Core Crown expenses (ex financing costs) – three budget projections
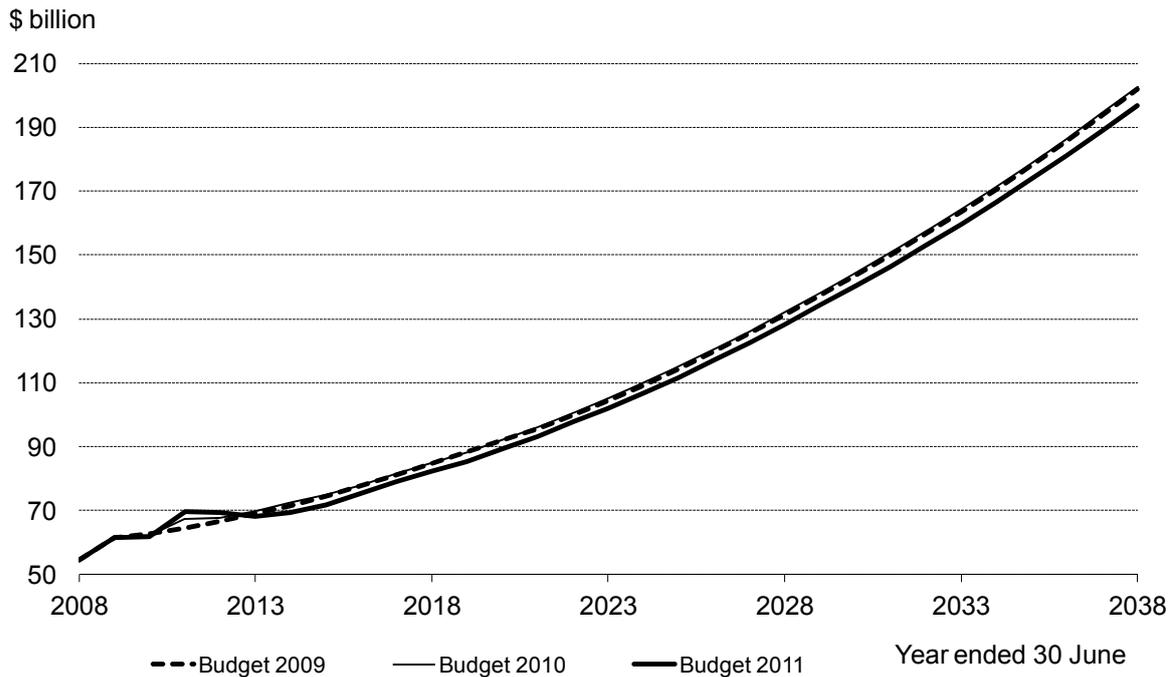
While there are some differences between individual expense classes across the Budget 2009 and 2010 forecasts, they are generally not large and there is a degree of offsetting as well. For example, a lower education spending base in Budget 2009 is basically negated by lower spending on justice, defence, etc., in Budget 2010. With different demographic drivers in particular, forecast base differences do change, but some degree of offsetting occurs across projections, too. For example, by 2050 the lower education spending of Budget 2009 is no longer offset by Budget 2010's lower spending on justice, defence, etc. The latter has risen, but the demographic driver of education has pushed it down much more. However, a small decrease in the health spending forecast between Budgets 2009 and 2010 has swelled to a much greater difference by 2050 that helps to offset some of the education difference.

This time it is Budget 2011 that provides the different story, as it included decisions to decrease allowances substantially for new operating spending. As a result, the Budget 2011 forecast expenditure base was lowered in all classes except welfare spending and debt financing costs. Some spending cuts in areas like KiwiSaver and Working for Families also reduced forecast spending. The outcome was that only NZS and debt financing costs were higher at forecast end than they were in Budget 2010, and even these differences were quite small. By 2050, despite NZS increases from Budget 2010 being lifted to well over $1 billion by its strong demographic driver, the Budget 2011 track was still nearly $10 billion, or 3%, lower than the Budget 2010 track. These differences are before taking into account radically reduced debt-financing costs.

If we put the two sets of changes together, it is now quite clear why the primary balance is so much stronger in the Budget 2011 projections than it is in those for Budget 2009. Stronger revenue projections in Budget 2010, owing to improved economic growth, coupled with a similar expense track, excluding debt financing costs, increased the primary balance between Budgets 2009 and 2010. Then a reduced non-debt financing expense track, produced by Budget 2011 policy changes, combined with similar revenue, boosted the primary balance projections between Budgets 2010 and 2011.

The different primary balance tracks are what drive each of the three budgets' operating balance tracks into deficit at different years in the projection horizon. As these projections contain no policy response to such a situation, the result is that the deficit is met from increased borrowing. With increased debt come larger debt-financing expenses, which in turn increase the following year's deficit. An even greater deficit requires even more borrowing to fund it, which leads to debt-financing expenses rising further. Once underway, and in the absence of any modelled response, the public debt stock and the interest costs on it reinforce one another's accelerating growth.
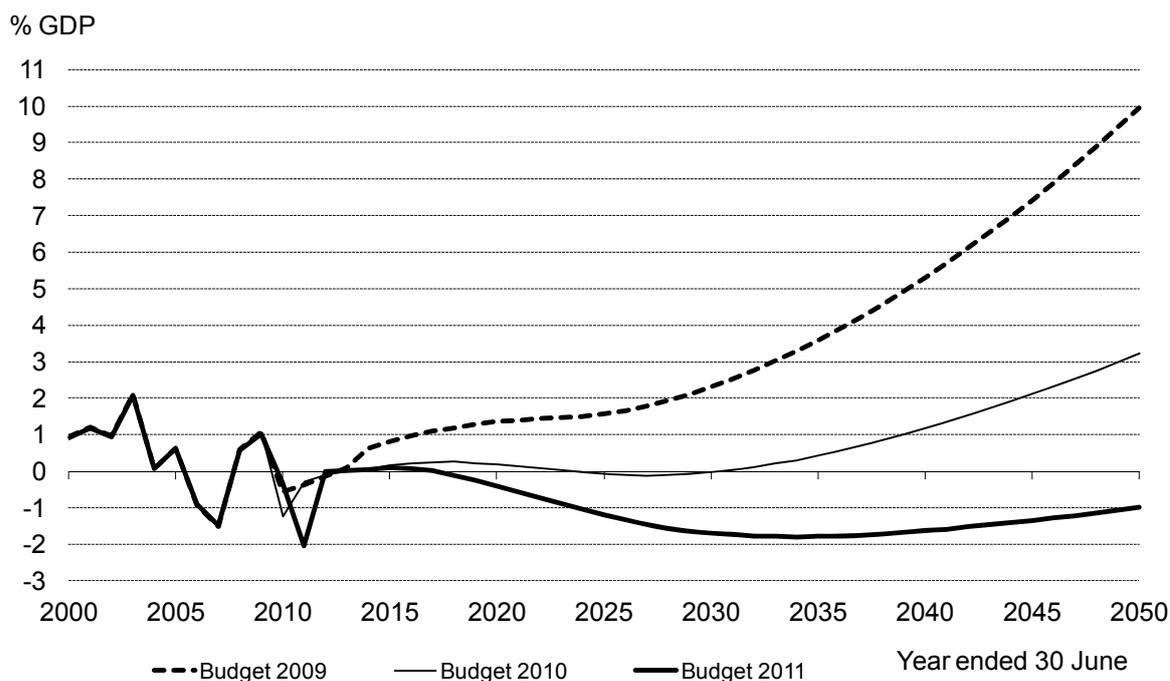
Figure 12 – Core Crown net debt-financing costs

Figure 12 illustrates the huge variation in the three budgets' net debt-financing expenses tracks, relative to GDP. The calculation logic is the same in all cases. It is simply the different length of time, between when deficits first appear and the projection end of 2050, which produces the differences.

The term "net debt-financing costs" is used because not only are debt-financing expenses excluded from the expenses in the primary balance but investment income and valuation gains are excluded from the revenue. It is more common to show a net measure in the order revenue less expenses, but that has been reversed in this measure because this corresponds to the same direction of impact on debt. Furthermore, it is not differences in these excluded revenue forms that produce such different tracks. Rather, the main influence is significantly different debt-financing expenses. By 2050 combined investment income and unrealised gains are $6 billion higher for the Budget 2011 track than for the Budget 2010 one, which is a further $3 billion higher than the Budget 2009 projection. By the same year, debt financing costs are $35 billion lower in the Budget 2011 projection than in that of Budget 2010, and this is over $53 billion lower than for Budget 2009.

As Figure 9 shows, the Budget 2009 primary balance never gets back to surplus, although it does improve from its GFC-induced trough in 2010, until around 2023. Hence it has the entire projection horizon for the debt stock and the finance costs they produce to add to each other's growth. The Budget 2010 primary balance projection, aided by stronger tax revenue, does manage to get back to surplus between 2017 and 2025. While primary

deficits start again from 2026, as growing expenses overtake flattening revenue, the length of time, out to 2050, for the mutually reinforcing gross debt and interest cost relationship to operate is shorter than it was for the Budget 2009 track. The Budget 2011 primary balance projection is stronger than those of both of the preceding budgets, as the revenue track is above that of Budget 2009 and expenses begin from a lower base than they did in Budget 2010. This leads to primary surpluses large enough to produce operating surpluses, from 2015 out as far as 2038. While debt levels and debt-financing costs do rise over the remaining 12 years to 2050, they have less time to grow rapidly than in either of the Budget 2009 or 2010 projections. In fact, for the Budget 2011 projection, by 2050 debt-financing costs have not surpassed investment revenue and valuation gains. Consequently the Budget 2011 net debt-financing expenses track, while rising, is still negative by 2050 and so is still helping to reduce, rather than increase, debt.

Figure 13 indicates the impact on the core Crown net debt tracks that the different projections of net debt-financing expenses produce.

Figure 13 – Net core Crown debt – contribution from net debt-financing costs
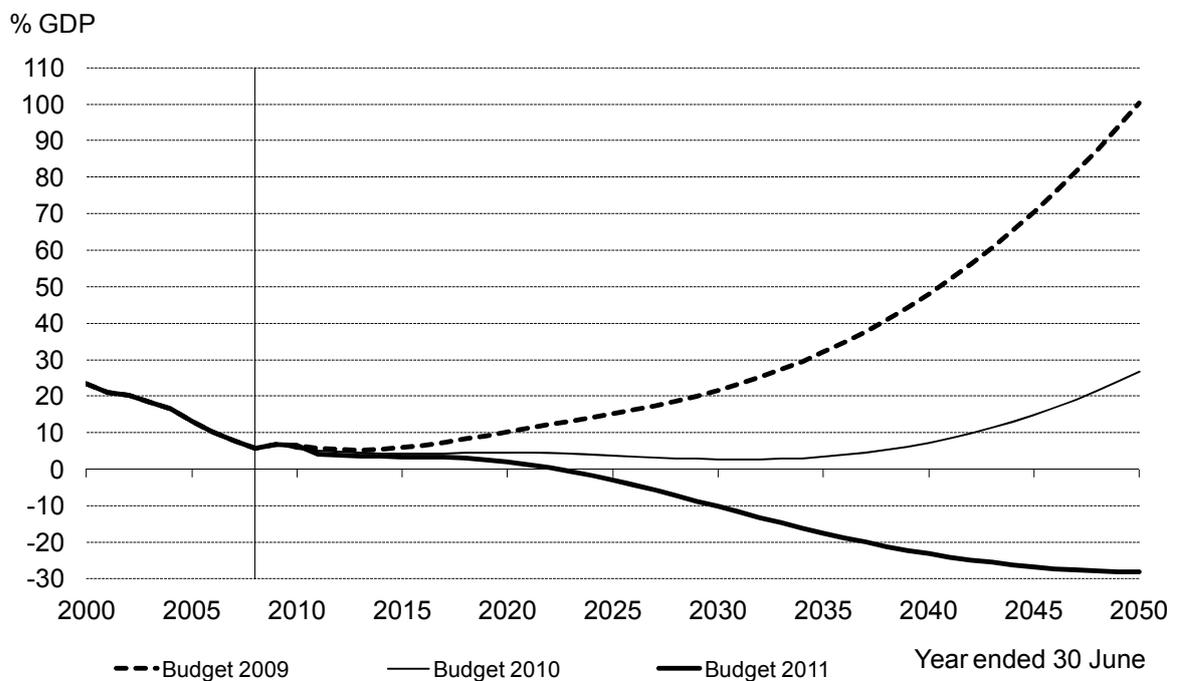
Figure 14 shows the three budgets' operating balance projections. It is interesting to compare them to the primary balance tracks illustrated earlier. They follow similar paths to their primary balances, but the growing wedge between their respective debt financing costs continually forces them further apart.

Figure 14 also contains a warning specific to the Budget 2011 projection. While the operating deficits are delayed until 2038, they do eventually occur. From this point onwards, as the earlier budget projections illustrate, the operating deficits will grow and cause net debt to grow with them. The Budget 2010 net debt projection is at the same level of GDP in 2031 as the Budget 2011 projection is by 2050, and by 15 years later the Budget 2010 net debt-to-GDP ratio has more than doubled

Figure 14 – Core Crown operating balance to GDP – three budget projections

% GDP

Budget 2009   Budget 2010   Budget 2011   Year ended 30 June
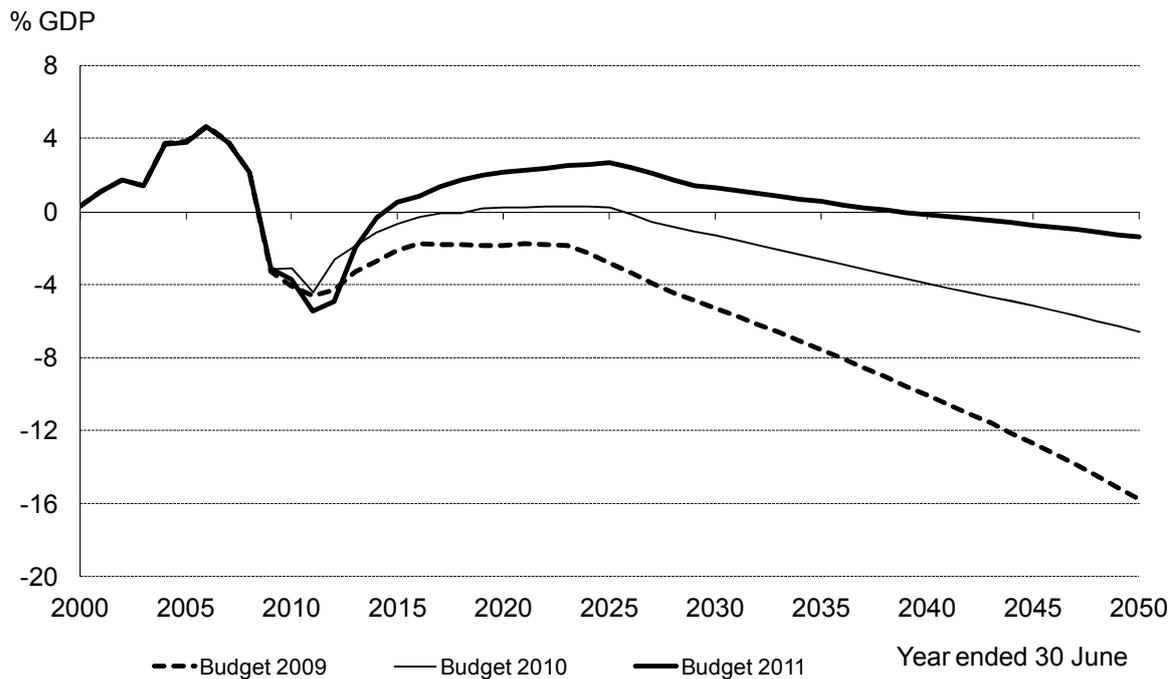
5.4   Reasons for policy change now

The last section finished by saying that there were warning signals still present in the 2011 Budget's long-term projections, but it is tempting to conclude that any problems now seem a long way off.

When we produced the Budget 2009 Long-term Fiscal Statement, with its net debt curve steadily rising to 223% of GDP by 2050, it was not hard to accompany it with messages about the need for action. But now we are looking at a net debt profile that falls from its forecast base to around 20% of GDP, and does not begin to rise from there until 2030. While we would want to avoid that rise, it looks manageable. Why should we not just take an approach of "We'll worry about it, when, and if, it happens"? Let us look at a few reasons why this is not the correct message to take from this.

If the explanation about what has caused differences in the long-term projections achieved anything, we hope that it indicated the projections are very sensitive to the forecast base from which they arise. Since the Budget 2009 projections, with the exception of the Christchurch earthquakes, most of the changes to the forecasts have been favourable. The impacts of the GFC on the New Zealand economy have proved, at least so far, not to have been as severe as we feared. Statistics New Zealand has revised up the GDP base and the growth outlook is higher. Ironically, even the tragedy of Christchurch, while hitting the Government's accounts hard in the 2010 and 2011 Budgets, is expected to stimulate the economy over the next decade as the city is rebuilt.

This was not all due to lucky outcomes without any policy changes accompanying them. As noted, most of the improvement between the Budget 2010 and 2011 projections was caused by lowering the forecast expense base. That was not good luck, but rather a conscious policy decision to reduce operating allowances in the 2011 Budget (and the following two budgets), as well as to make spending cuts in some areas. The main reason for doing this was to get back to an operating surplus sooner, so inhibiting the growth of

debt and avoiding costly downgrades by international credit-rating agencies. But these short-term reasons for fiscal consolidation, with the possible exception of avoiding a downgrade, ultimately achieve similar results in the long term. So the Government made policy responses to avoid worsening deficits and these have improved both the short-term and long-term fiscal positions.

The message in this for policy makers is about applying a long-term lens to the decisions they make. Whether those decisions are to do with raising or lowering tax rates, or lifting or cutting spending, they have implications for the long-term fiscal position. This is especially true, if the policy changes are not temporary fixes, designed to be reversed once they are no longer required to address a particular situation.

Another point around the sensitivity of the forecast base is that events over the next few years, months or even weeks could easily see it deteriorate again. Since the 1970s, the New Zealand economy has been buffeted by a series of shocks. These include: loss of our preferential trading position with the United Kingdom in 1973, when it joined the European Economic Community, the two oil-price shocks in 1973 and 1979 and other commodity price shocks in that decade; the stagnation of 1984-1992; the drought/Asian financial crisis of 1997-98; the global financial crisis of 2008-2011; the major Christchurch earthquakes of 2010-11; the 2012-13 drought. Our country appears prone to shocks of one form of other.

In addition, the New Zealand economy has structural imbalances, such as persistent current account deficits, and an over-reliance on the non-tradable sector for growth. These leave us vulnerable to events largely beyond our control, which could worsen our fiscal position and damage our prospects for growth. If the forecast base deteriorates, for any of these reasons or from others, then the analysis in this paper makes it clear so will the long-term fiscal position.

Another reason why fiscal consolidation has been occurring recently is to restore the debt buffer we had going into the GFC. In 2008, net core Crown debt stood at less than 6% of GDP. That lifted rapidly as the GFC and then the Christchurch earthquakes lowered tax and other revenue streams and increased expenses. But, unlike some other nations who were affected far more than New Zealand, we had some room to move. Our low public debt going into the GFC enabled the government to borrow to cover shortfalls, rather than immediately make spending cuts that might have further stifled demand and delayed recovery. Even if no further downturn occurs in the near future, the nature of economic cycles means that some significant ones will almost definitely occur over the 40-year horizon of the long-term projections. When they do, having a low debt position as a buffer, as we did in 2008, will again be beneficial.

The above arguments seem a little one-sided. They focus on downturns, but it could be argued that New Zealand has experienced boom times in the past, as recently as most of the last decade, and almost undoubtedly will again. That is true, but such economic good times bring their own risks for the long-term projections. If surpluses are used, for example, for paying down debt to restore the buffer, they will help. But, unfortunately, there is no guarantee that will occur. Governments often choose to spend more in a boom or in the lead-up to an election. As a result, periods of fiscal constraint do not normally last long. For example, core Crown non-debt financing expenses rose from 27.3% of GDP in 2004 to 29.7% by 2008, an increase of 2.4 percentage points. This would not be so bad if tax and other non-investment revenue had done the same, or if the spending had been on growth-enhancing infrastructure, but the revenue increase in the same period was only 1.4 percentage points.

Fiscal consolidation brings costs to New Zealanders, as well as the gains of lowering debt and the interest we pay to foreign lenders. Reducing funding in some areas and lowering the operating allowances for new spending across the Budget 2011 forecast horizon clearly mean that New Zealanders will receive less in publicly funded goods and services.

The Cost Pressures projection assumes no policy response to growing debt; it also simply grows expense classes from their end-of-forecast levels with the same drivers, no matter whether or not the levels of expenditure generated are acceptable to the New Zealand population. The reduction in any expenditure class over the forecast horizon is never reversed in projections, but rather is grown out into their entire 40-year horizon.

Figures 15 to 17 examine different long-term projections for the three major expense categories that derive their growth over a forecast horizon from a share of the operating allowances. These expense categories are the two large areas of health and education, as well as a combination of all the other non-welfare, non-debt financing spending such as justice, defence, core government services, economic/industrial services, etc. Welfare expenses, including NZS, are excluded from the operating allowances because they are demand-based spending. Debt-financing costs are also excluded, as they depend on gross debt levels.
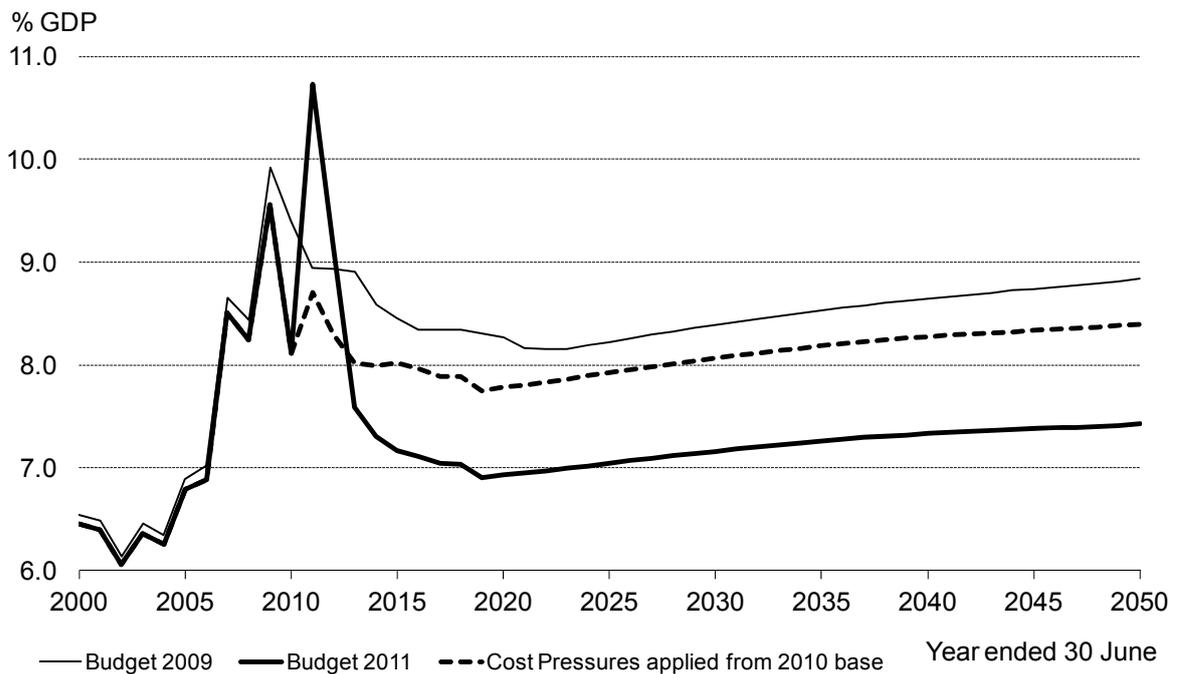
Figure 15 – Core Crown health expenditure to GDP
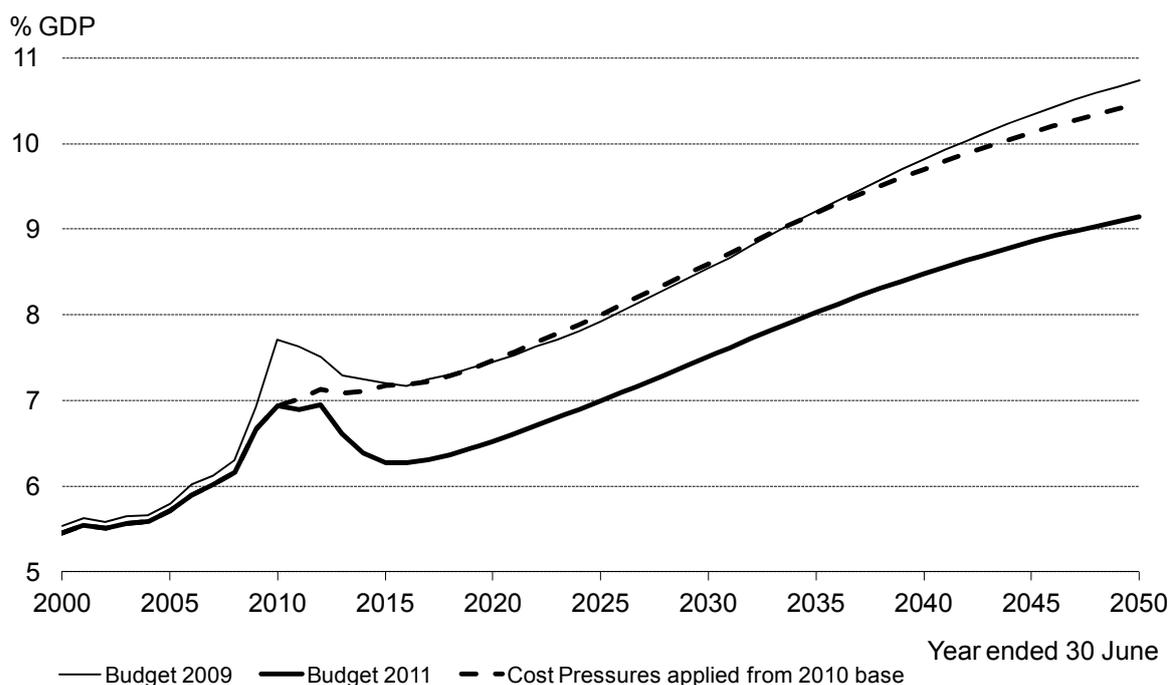
Figure 16 – Core Crown education expenditure to GDP

% GDP

Year ended 30 June

—— Budget 2009 ▬▬ Budget 2011 ▬ ▬ Cost Pressures applied from 2010 base
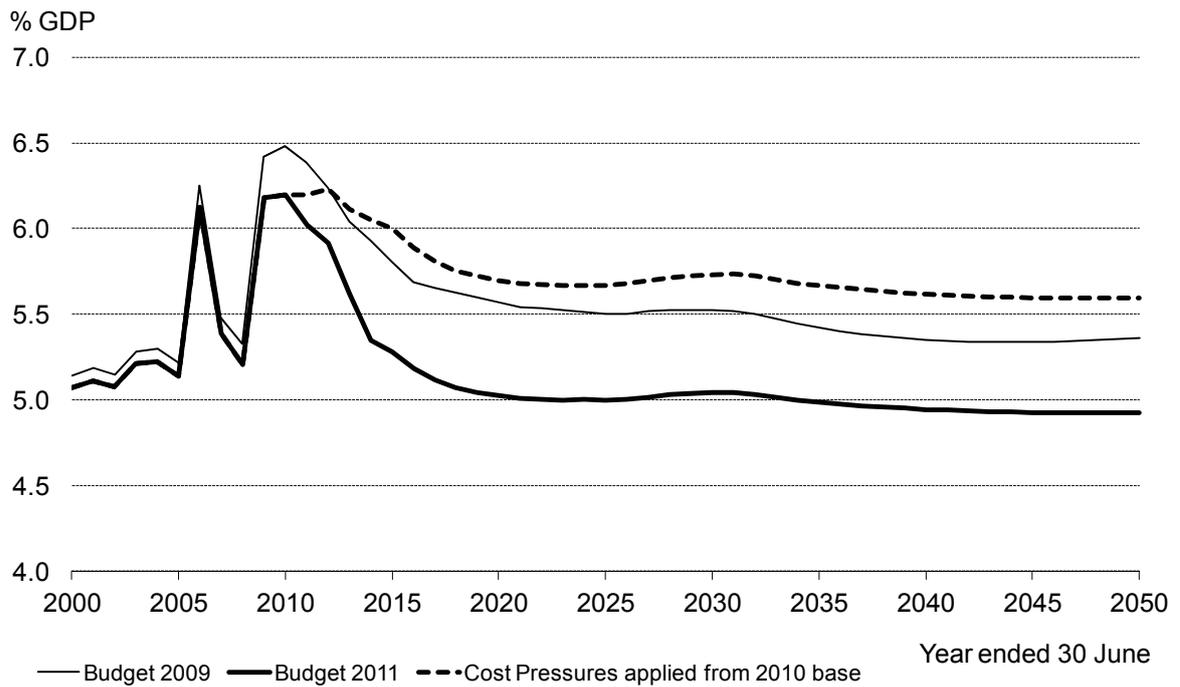
Figure 17 – Core Crown justice, transport, administration, etc., expenditure to GDP

% GDP

Year ended 30 June

—— Budget 2009 ▬▬ Budget 2011 ▬ ▬ Cost Pressures applied from 2010 base

The figures compare their Budget 2011 projections, from an end-of-forecast level in 2015, with a projection using the same drivers from their last known value in 2010. To show that these projections from the 2010 base are reasonable, especially in the case of the rising health one, the Budget 2009 projections are also included. Incidentally, the 2011 spike in the all other spending (Figure 17) is largely due to an assistance package on weathertight buildings and the Canterbury earthquakes.

The figures make it clear that the reductions to expenditure baselines in the Budget 2011 are significant. Under the Cost Pressures projection, they also mean that, for most non-welfare spending, New Zealanders will need to make do with less than they have been used to from the public purse. Health spending still rises as a proportion of GDP, but it is now on a lower path than it has been in the recent past.

None of the above is surprising. This paper has already noted that the Budget 2011 net debt projections improved from the Budget 2010 ones, because spending was reduced. But the figures do illustrate where those spending cuts will be most felt. And this raises two points, about how long they can be sustained and their distributional impacts.

In regard to the first point, given the general growth in demand for health care over the last few decades, will New Zealanders accept health spending growth being reined in? Perhaps they will, as wealthier individuals rely more on private health care and public services become more restricted to a needs basis. But most people require more health care in old age, and New Zealand has an ageing population. That factor alone suggests reducing public funding in health will not be easy.

With the need for a more skilled workforce to lift the country's productivity, will it be possible to reduce education spending, as a ratio of GDP, to less than it is now over the next 40 years? Admittedly, the growth of the demographic driver behind education spending is reducing as our population ages. However, participation rates in the senior levels of secondary education and in tertiary training will need to lift from current levels in order for a greater proportion of the population to gain skills. Consequently this demographic dividend in education might not be what the projections suggest. Again, the obvious response will be for people to fund more of their education themselves, but this may reduce the role of education in maintaining income mobility and the positive externalities of widely available tertiary education.

Figure 18 – New Zealand Superannuation expense to GDP
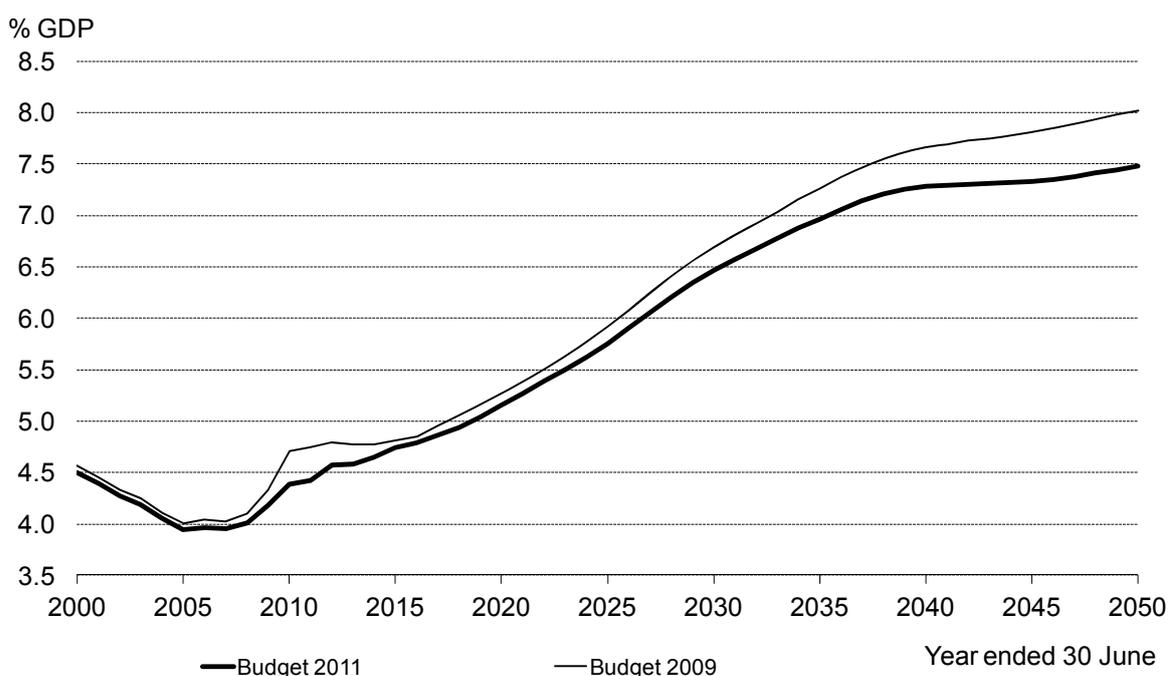
Many more examples of heightened social and economic pressures resulting from more constrained public spending growth could be made, but the point we hope is clear. The projections are currently "lines on a graph" and it will require current and future administrations sticking to these spending plans to make them materialise. That may be easier said than done, as pressures on funding in these areas increase.

There is also a question of equity, illustrated to some degree by Figure 18 of NZS expenditure projections based on Budget 2009 and Budget 2011.

The Budget 2011 NZS projection has decreased a little compared to the Budget 2009 version, but this has nothing to do with spending cuts. NZS is a purely demand-based forecast, so the factors that have reduced it a little, as a ratio of GDP, are a stronger GDP projection in Budget 2011 coupled with a small reduction in Statistics New Zealand's view of the growth rate of the 65-and-over age group over this period.

The equity question is clear when you contrast Figure 18 with Figure 16, which depicts education expenses projections. The education track stays relatively flat, as a percentage of GDP, while the NZS-to-GDP projection steadily rises. While spending on the elderly will grow faster than the economy, and hence the tax revenue required to fund it, education spending will only keep pace with GDP. Potentially as more tax dollars are devoted to providing public pensions, increased pressures in education will need to be largely met by the users. The consumers of education are mainly younger people, although increased costs will be placed on the middle-aged, too, as parents need to fund more of their children's studies.

The current forecast base is not assured, as it inherently involves risk. Much of the strength of the latest projections rests on these forecasts, but for reasons that have been discussed and for others that have not been covered (and we may not even be able to perceive at present), this forecast base may not happen.

The key messages of the 2009 Long-term Fiscal Statement were:

• Make policy changes early, as they require smaller, more gradual adjustments

• Control spending and focus on public sector productivity, and

• Make economic growth a priority.

Delayed expenditure adjustments may make it harder to undertake reform because it requires a larger change from the status quo and increases vulnerabilities to shocks. Early changes limit the growth of debt-financing costs and allow more time for less pressured policy changes and for people to prepare for the changes. Failing to follow this prescription on the basis that the latest long-term projection looks better would be gambling with the prospects of current and future generations of New Zealanders.

6 Living within our means – what does it take and what does it mean?

The previous section of this paper looked at why the last three budget projections of net debt appeared quite different, but concluded by pointing out that they all lead to the same eventual outcome. That outcome is:

- Using bottom-up drivers of expenditure growth, such as demographic demand, labour inputs, inflation, and so on, which are based on historic averages, will result in core Crown expenses eventually overtaking revenue, when the latter's long-term path is based on historical average ratios of tax to nominal GDP. Once that occurs, ongoing operating deficits will add to debt, which will drive up debt-financing costs, so increasing deficits and the debt stock at an accelerating rate.

- Wherever the core Crown net debt-to-GDP ratio ends up, after these deficits begin, is really just a function of the number of years of deficits. Projections of net debt from a Budget 2011 forecast base are much lower, by 2050, than those for Budget 2009. This is largely due to the Budget 2011 forecast base having lower expenditure and higher revenue than the forecast base of the Budget 2009 projections. As a result, it takes longer for expenses to overtake revenue, but it does eventually happen.

- Hence the real message is not the level of the debt curve, but rather its slope. Once the net debt curve turns upwards, it is a signal that expenditure and/or revenue policy settings are no longer sustainable. Without changes to at least one of these (expenses or revenue), debt will continue to grow and bring with it a number of fiscal problems.

The rise in longevity and the fall in fertility are structural changes in demography and have a permanent effect on the fiscal position. The post-war baby boom can be regarded as a temporary cohort effect: it lowered the median age of the population in the latter half of the 20th century and will raise the median age over the coming few decades. After the 2040s, it will have little effect on the fiscal position. This suggests that building fiscal buffers before most of the baby boom reaches age 65 will not be enough over the long term and more permanent responses may be required.

This section of the paper looks at one option for addressing this problem of rising debt, which is changing expenditure growth. Of course, this is not the only solution. Raising taxes is another way of tackling deficits, but this has potential negative implications for economic growth. It also makes New Zealand a less attractive destination for immigrants in a future where skilled labour will be more and more mobile.

Lifting economic growth is another way deficits might be avoided, as this tends to increase government revenue, largely via the size and wealth of the tax base, more than it does public expenditure. However, this is easier said than done, and so revenue or expenditure options need to be available in case higher growth is not achieved. Both these options are used to illustrate possible ways of achieving sustainable levels of debt in the 2013 statement and background papers (New Zealand Treasury, 2013). The aim of this paper is not to debate the pros and cons of various methods of addressing our public debt. There are options, but it is the avenue of reduced future public expenditure that this section will examine. It will do that by looking at a level, or levels, of expense growth that align with some stable level of net debt to GDP in the future, under set tax revenue projection assumptions.

We have used 20% net debt to GDP as the long-term stable level in our modelling. This should not be interpreted as Treasury's view on what the long-term value of this fiscal indicator should be. It has been chosen because a target value is needed and the present Government has stated, in the *2011 Fiscal Strategy Report* that ". . . we will return net debt to a level no higher than 20% of GDP by the early 2020s" (English, 2011).

As earlier graphs show, the Cost Pressures technique produces a rising net debt track, relative to GDP, even from the Budget 2011 forecast base. An alternative approach, designed to reach and then maintain a stable level of net debt to GDP in projected years, is to impose constraints on the growth of the expense classes which are not treated as demand-driven. In this paper, this is labelled the Constant Debt scenario and it mimics the Budget forecast approach of setting operating allowances for new operating spending. The growth of most expense classes is assumed to come from a share of the operating allowances. The main exceptions to this are the majority of welfare spending and debt-financing costs, which, along with all forms of revenue, gains, assets and non-debt liabilities, are projected in the same manner as they are in the Cost Pressures scenario.

Top-down expenditure growth is not usually applied in long-term projections. This is mainly because, in a democracy like NZ, governments will come and go, meaning none could be expected to be able to impose their spending plans over such a long horizon. However, with that point accepted, there is no reason why the modelling logic cannot be applied over the long term. Furthermore, this technique allows a useful comparison of different projections, as well as with historical settings, via the size of operating allowances that produce particular net debt tracks.

Figure 19 – Net core Crown debt to GDP – alternative expenditure paths
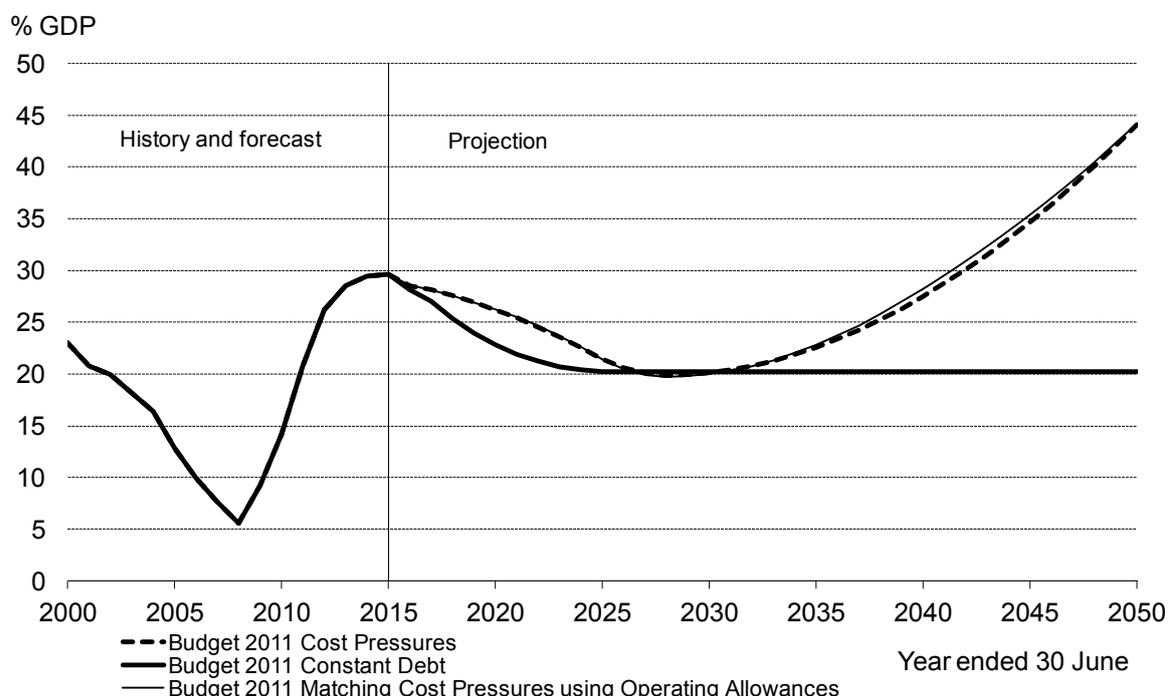

Figure 19 shows three net debt projections, with the dashed line being the now familiar Budget 2011 Cost Pressures track

While hard to discern, the light solid line depicts a similar net debt track from the same base. This has been produced by applying operating allowances designed to mimic the combined bottom-up growth of health, education, law and order, defence, etc. The heavy Constant Debt line also applies projected operating allowances from this base. In this case, they have been designed to stabilise net debt at 20% of GDP.

The interesting question is: What changes are needed to the size of the projected operating allowances to alter the path of the net debt track from that which mimics Cost Pressures to one of a stable, unchanging ratio to GDP, i.e., the Constant Debt line? The answer to that question is provided by the graph below, which also displays a few other notable features related to future expenditure growth.

Figure 20 – Core Crown operating allowances to GDP
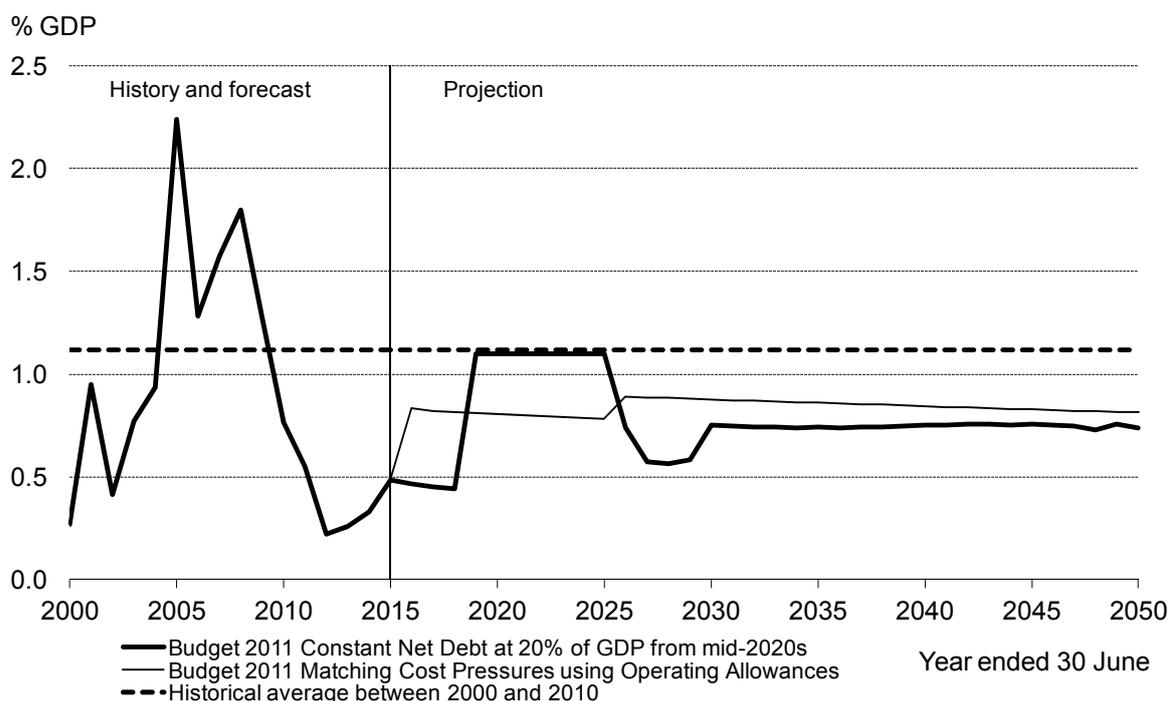
This again demonstrates the principle that was instrumental in producing the seemingly quite different net debt tracks from the three consecutive budget forecast bases. This is that there is a fine line between producing surpluses, or at least balanced budgets, and deficits, but the latter will quickly accelerate the growth of debt as they induce rapidly growing debt-financing costs.

Note also that, as the Constant Debt projection follows a gradually easing path of reduction before levelling out, it requires lower operating allowances than the Cost Pressures track does in the early years of projections. Once nominal net debt levels no longer need to reduce in order to keep net debt to GDP falling, around 2020, a few years of higher operating allowances are permitted. These are of similar size to the previous decade's average. Post-2025, the operating allowances settle at a fairly constant level of 0.75% of GDP, in order to keep debt stable.

The Cost Pressures operating allowance track is more stable at around 0.8% of GDP from the beginning of projections. A small fillip is allowed around 2026 as the net debt curve is allowed to start curving upwards, with a very gradual decline across the remaining projected years to match the true Cost Pressures net debt profile.

The other interesting point that arises from Figure 20 concerns the average ratio of operating allowances to GDP over the last decade, 2000 to 2010. The size of the operating allowances in individual years have differed quite markedly, from a peak of 2.24%, or nearly $3.5 billion, in 2005 to only 0.27%, or just over $300 million, in 2000. Despite their erratic nature, their average of 1.12% for this 10-year period is higher than even the long-term Cost Pressures ratio.

This has some major ramifications for policy makers and for the public, who are the ultimate recipients of these publicly-funded goods and services. All else being equal – the assumed tax settings, the assumed growth of demand-driven welfare spending, and so on – debt can only be stabilised by providing less of at least some of these goods and services from the public purse in future.

Future operating allowances at 0.74% of GDP represents only two thirds of the previous 10 years' average of 1.12%. At a time when an ageing population is driving up demand in some areas of public spending (health is the prime example), it will not be easy to achieve getting by on reduced budgets. It is likely to require more stringency around funding conditions, such as means-testing or time-limited access to some services.

This issue is more thoroughly explored in the Treasury's 2013 Long-term Fiscal Statement (Treasury, 2013). However, it is worth concluding this section with a thought experiment related to the cost pressures arising from an ageing population.

The Budget 2011 projections have NZS expenditure rising from 4.4% of GDP in 2010 to 7.5% by 2050. The main reason for this is the growth in the recipient group, as the 65-and-over age group is growing and will continue to grow over at least the next 20 years, substantially faster than the population of people aged 15-64.

Let us assume that, by some means, the growth of NZS could be restricted to around half of the Budget 2011 projection, so that it reaches 6% of GDP by 2050. The "some means" is not the concern of this paper.[13] Here we will simply assume some policy change or changes can be made to NZS parameters to achieve this.

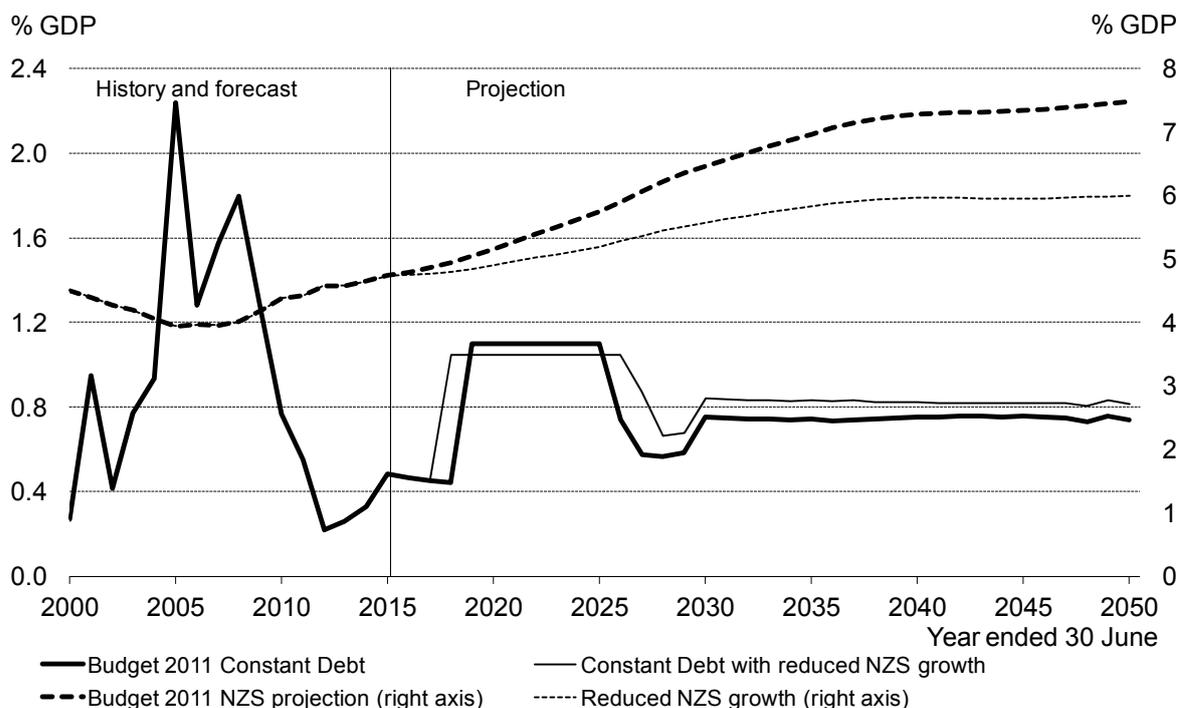Figure 21 depicts, using two vertical axes, the:

- Budget 2011 operating allowance path that will stabilise core Crown net debt at 20% of nominal GDP (heavy full line, corresponds to left axis)

- alternative operating allowance path that will stabilise net debt at the same level if NZS expenditure is reduced (light full line, left axis)

- Budget 2011 NZS expense-to-GDP projection (heavy dashed line, corresponds to right axis), and

- reduced NZS expenditure projection, where NZS only grows at about half the rate it does in the Budget projection (light dashed line, right axis).

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[13] As an example of such a change, the 2009 Statement used the illustration of lifting the age of eligibility from 65 to 67 by 2023 and then indexing it to longevity, as well as indexing the payments to a little less than the nominal wage growth could achieve a lowering of NZS of this size by 2050.

Like the operating allowances for the main Constant Debt projection, those for the Reduced NZS scenario are initially quite small in order to keep the debt curve reducing from its end-of-forecast levels. But, with less NZS expense, the operating allowances can be increased slightly earlier than in the main projection and held at these higher levels for slightly longer. Even more importantly, when they need to decline again in the post-2025 period, the drop is not as large as for the main Constant Debt projection and debt is stabilised with a permanently higher level of operating allowances to GDP.

Figure 21 – Core Crown operating allowances and NZS expenses to GDP

These higher annual operating allowances average, across the 25 years between 2026 and 2050, 0.82% of GDP. Remember that the operating allowances that mimicked Cost Pressures averaged 0.85% of GDP per annum over the same period.

Averaging the annual operating allowances over the entire projection beyond 2015 includes the years 2018 to 2026, when higher operating allowances can be run in the Reduced NZS scenario as debt reduction eases to a constant GDP ratio. This gives an average annual operating allowance of 0.85% of GDP across this 35-year projection. This is slightly higher than the 0.84% average for Cost Pressures.

Putting aside all the averages and graph lines, what does this really mean? NZS is a form of public expenditure whose recipient group, the majority of New Zealanders aged 65 and older, is growing more rapidly than the labour force that drives GDP growth. As a consequence, NZS is expected to grow more quickly than any other major expense class and considerably more quickly than GDP.

Furthermore, under plausible assumptions around tax revenue growth, maintaining historical levels of growth in all other expenditure classes will lead to operating deficits, which will quickly accelerate debt levels to unsustainable levels.

Consequently, if expenditure is to be reined in as a means of stabilising debt, one way is to reduce long-run operating allowances to around two thirds of what they have averaged over the last decade. To do this will mean either across-the-board reductions in spending on health, education, justice, defence, etc., or future governments having to make tough decisions about which areas will have funding reductions.

However, if some means of reducing the growth of NZS could be achieved, say to around half of its current trajectory, then this would be the only expense class that would need to be reduced to stabilise debt. All other areas of core Crown expenditure could continue to be funded in line with their historical growth levels, without causing debt to rise rapidly. NZS would still be one of the strongest growth expense classes, probably second only to health spending, and the spending reductions necessary to "live within New Zealand's means" would be more fairly shared between generations.

7   Conclusions

This paper has examined the effects of changes in the short-term economic and fiscal position on the sustainability of net debt as a ratio of GDP by the middle of the 21st century. In particular, compared with the 2009 and 2010 Budget cases, the 2011 Budget projection assumes good progress is made with the planned fiscal consolidation and that the economy over the near term is not hit with any further shocks, or policy reversals. The low net debt-to-GDP outcome in the 2011 Budget projection also depends on the resulting sustained series of fiscal surpluses (lasting for the better part of two decades) which work against rising demographic and other cost pressures and steadily lower the net debt ratio. For a time, while surpluses last, the 2011 Budget projection is a prefunding scenario.

This illustrates the positive power of debt dynamics. Eventually, though, the pressures of ageing and stable tax-to-GDP assumptions still produce rising debt as a ratio to GDP: the turning point has just moved out.

Shocks aside, we should not pretend that the long period of fiscal consolidation will be easy to achieve. The paper looks at what the top-down constraint means for the larger spending categories (assuming no changes in welfare or NZS spending). This assumes the present shares of spending will persist in the future. By 2050, core Crown expenses, excluding welfare and debt-financing costs, have dropped from nearly 25% of nominal GDP in the 2009 Budget projection to 21.5% in the 2011 one.

If the projected spending tracks of both health and NZS are unaffected by the consolidation (they are among the largest spending categories), it is hard to see how the announced fiscal consolidation can be sustained. Present modelling of other large spending categories indicate flat or falling spending-to-GDP ratios. While this consolidation looks good on paper, it requires fairly deep cuts across many programmes which may be unacceptable to many New Zealanders. Where we make the choices in the spending or tax areas will have growth, equity, and social-cohesion effects.

One of the main messages we take from this paper is that the flow-on from short-term decisions dominate the long-term fiscal future. Flipping this over, we see that it is important to keep the long run in mind when looking at changes in the short term.

The fiscal consolidation plans laid out in the 2011 Budget (and the following ones) are important for several reasons. They help restore the debt buffer against the next shock. They take pressure off monetary policy and the exchange rate, and so boost our tradables sector. Eventually, they feed through to a better current account and net foreign liabilities position. This paper also emphasises the benefits of maintaining surpluses to extend a sustainable fiscal position into the long term.

NZS and health spending will increasingly dominate future budgets, and without changes in these areas, we will face limited options about how to put the accounts onto a sustainable basis. Achieving budgetary surpluses by pushing up taxes faces difficulties: higher income taxes tend to have a dampening effect on growth. But it's not just the negative growth effects of lifting tax rates that New Zealand faces. Increasingly we are seeing more competition for people and firms from lower tax rates in Australia and beyond.

Higher overall productivity growth would help sustainability, but achieving higher growth has proved elusive. Further constraint in education spending does not seem to be a way of achieving the productivity growth we require to limit the rise of net debt over the long term.

Living with debt at a permanently higher level of GDP than we had before the GFC means that future governments will have less flexibility to deal with the next global crisis. More of the revenue collected would be needed to pay interest to bond holders.

While this paper has not dealt in any detail with possible solutions to the fiscal challenges, the 2013 Statement and associated papers put forward some options along with an indication of their effects on living standards (New Zealand Treasury, 2013). The Chair in Public Finance at Victoria University of Wellington has produced a Long-term Fiscal Calculator, in conjunction with the Treasury, to illustrate some of the options for meeting the fiscal challenge over the coming decades (Chair in Public Finance, 2013). It also lays out the trade-offs involved in the policy choices.

The three sets of projections in this paper show as a society we have some hard decisions to take to achieve fiscal sustainability. These include:

- how to share the growing fiscal burden among generations

- cutting the quantity of publicly-funded services in an equitable way, while maintaining protection for society's most vulnerable people, and

- ensuring our tax system can fund our needs without becoming a brake on economic growth.

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