Wisdom of Ageing: Lessons from fiscal projections

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NEW ZEALAND TREASURY

JUNE 2011

NZ TREASURY

Wisdom of Ageing: Lessons from fiscal projections

MONTH/YEAR

June 2011

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ACKNOWLEDGEMENTS

The authors would like to thank our Treasury colleagues John Janssen, Tim Hampton and Oscar Parkyn, for their helpful comments and suggestions on a draft of this paper.

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Abstract

At each budget, the Treasury projects and reports on the government accounts to the mid-2020s, but projections can be extended to 40 years or further. Recent budgets have produced quite different long-term projections. This paper examines the causes of changes to primary balance and net debt projections, and shows the effects of constraining debt. It argues that, even though the level of debt-to-GDP shifts, the messages remain the same: spending and possibly tax policies need to change if we are to avoid passing our debt onto our descendents, and early changes alleviate the need for more drastic revisions in the future.

JEL CLASSIFICATION H69, H51, H55

KEYWORDS Long-term fiscal projections, Fiscal sustainability

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Wisdom of Ageing: Lessons from fiscal projections

1 Introduction

New Zealand, like many other OECD-member countries, has an ageing population structure. This produces a number of challenges, both fiscal 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, because announcing changes early gives people longer to adjust and making these changes early generally reduces the severity of potential later adjustments.

This paper shows how 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. "Sustainable" means that expenditure and revenue settings do not lead to substantial and sustained increases in government debt relative to GDP over the long term. This sustained rise in the debt ratio will occur if we reach a stage

where primary deficits continue year after year.[1] At that point, compound interest takes over and produces accelerating debt growth.

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 using the recent 2011 Budget as a starting point along with a set of assumptions drawn from New Zealand history, and contrast this with where we were in the preceding two budgets. 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 paper also briefly compares the effect of longer–term assumptions in the New Zealand reports with those in recent projections in other countries, especially Australia. As NZS is such a big component of the age-driven lift in government spending in New Zealand, we compare it with the public pension systems in some other nations.

The above approach produces an endogenous debt track as a way of illustrating the pressures on the fiscal position from ageing, wages and technology cost growth. Another approach to fiscal reporting is to select a suitable sustainable debt path, based on current government policy or on history, and then examine how parameter settings for expenditure or revenue would have to change from historical averages for debt to follow this path.

The paper has the following structure. After a discussion on 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 the demographic projection and compares the base-case life expectancy assumption with those in similar countries. We then turn to our economic and fiscal modelling approach and assumptions. The core of the paper is the fifth and sixth sections. These use the past 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. The sixth section shows what constraining debt in the 2009 projection might mean for operating allowances in the long term. This is followed by a section comparing our policy reforms with what other countries are doing about their fiscal positions over the long term, particularly in the ageing-affected areas of health and pensions.

The paper concludes with a section pulling together the lessons from the comparisons of the three projections based on the three recent budgets.

[1] Primary deficits exclude interest income and debt-financing expenses.

2 How our approach to economic and fiscal projections has evolved

Over the years, the Treasury has released economic and fiscal forecasts that have taken an increasingly longer view on the consequences of budget decisions and current policy settings. For each budget the Treasury provides the Minister of Finance with 10-year projections beyond the end of the five-year forecasts to show under a set of plausible assumptions how the choices made today might affect the fiscal position in the mid-2020s. These projections help inform the Government's Fiscal Strategy.

In this work, we distinguish between forecasts and projections. Forecasts are best shots of where the future is heading, usually made with a model of several of the interactions taking place in the economy. As an example, the Treasury uses the New Zealand Treasury Model (NZTM), a macroeconomic general equilibrium 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, including no policy responses, and are designed to answer broad "What if?" questions.

The projections in this paper depend on current baselines in tax and programme spending and how well the economy is expected to grow over the coming five years. The Fiscal Strategy projection methodology follows the budget process: most new spending is constrained by pre-set operating and capital allowances. The main expenses not included in the operating allowance are demand-driven increases in benefit spending and the universal public pension, NZS, and debt-financing costs. The differences in horizons, models, and macro-economic and fiscal inputs are summarised in the following table.

Table 1 – Different projection horizons and models, Budget 2011

Horizon	←2010	2011-2015	2016-2025	2016-2050→
	History	2011 Budget Forecast	Fiscal Strategy Projection (debt target)	Long-term Projection (debt endo/exogenous)
Macro	SNZ	New Zealand Treasury Model	Fiscal Strategy Model	Long-term Fiscal Model
Fiscal		Agencies' spending forecasts	Fiscal Strategy Model	Long-term Fiscal Model
	Treasury	Treasury tax forecasts	uses Budget forecast plus	uses Budget forecast plus
		Govt decisions re allowances	allowances and Fiscal Strategy	growth parameters based on history

Note: All the years in this paper refer to the government financial year ending 30 June. SNZ is Statistics New Zealand. Long-term Projection (debt endo/exogenous) 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 endogenous); the other imposes an exogenous debt track and changes spending, or revenue, or other parameters to achieve that debt.

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). Population ageing is not a major driver of expenditure growth in the 10-year, Fiscal Strategy projections, because the major sources of spending growth, the allowances, depend on political choices and so are largely independent of population change.

Projections over this horizon (to the mid-2020s) provide useful indications of the consequences on budget decisions on debt, contingent on the amount of new spending in each budget (the allowances). These projections are less useful as an indicator of the sustainability of the fiscal position in the face of population ageing. For this purpose, those reporting on fiscal sustainability use projections made over a longer-term horizon, with historical growth parameters and the short-term budget economic and fiscal forecasts as a basis for looking ahead.

In this case, we say the fiscal position is sustainable if it does not lead to debt growing faster than nominal GDP in the long term. In our earlier reports on fiscal sustainability, we followed what has become the standard practice among OECD countries: Project spending beyond the near-term forecast horizon using current policy settings and historic economic and fiscal growth parameters. Tax is largely constrained by GDP growth, while expenditure reacts to demographic and other cost pressures. The result each time has been accelerating growth of debt, the result of deficits adding to debt and then rising debt-financing costs, leading to higher deficits and higher debt.

Early on, several people objected to this approach, saying that these projections would not be allowed to happen as the rising debt would produce internal or external pressure for policy changes. While that is true, the point of the projections is less about what happens 40 years from now, but more about sounding an alarm over where today's decisions are sending the Crown's balance sheet (if debt is exploding). Nevertheless, their concerns set us thinking about other ways of illustrating the pressures we are facing.

Under the fiscal responsibility provisions in the Public Finance Act, the government has chosen to announce a debt ratio to GDP and then explain how debt will remain below the target. This debt constraint provides a parallel approach to long-term fiscal projections: Use the government's debt ratio ceiling (extended out to the longer horizon of 40 or more years) and require changes to tax, or expenditure, or other parameters so that this target is met. The first long-term fiscal statement (The Treasury, 2006) outlined the drivers of tax and spending, produced a set of projections and briefly discussed policy changes that might lead to a sustainable fiscal position in the long term.

In the second statement, *Challenges and Choices* (The Treasury, 2009), we produced projections based on historic trend growth (Challenges) and also discussed examples of policy choices and tradeoffs (Choices) that would produce sustainable debt projections (meeting a net debt-to-GDP target level of 20% in 2050). Under this assumption, for example, if the government were to leave benefits and NZS unchanged, then sustainable debt at 20% of GDP in the long run required reductions each year in the real amount of services a person receives on average from spending (other than on finance costs or benefits) between now and the mid-2020s by which time the reduction needed was 10% from the starting level. This restraint could be slowly relaxed over the following quarter century for the debt projection to hover around 20% of GDP. The 2009 report also contained examples of fiscally sustainable debt tracks obtained by raising tax, or reducing health spending, or changing NZS settings, or improving the productivity of the public service, and combinations of these changes.

Before the next report, planned for release in early 2013, we want to test our assumptions and modelling with many groups of people, devise better ways of illustrating demographic and other uncertainty, find out more about what New Zealanders value about government services, and come up with ways of comparing different fiscally sustainable policy packages over a range of criteria/objectives.

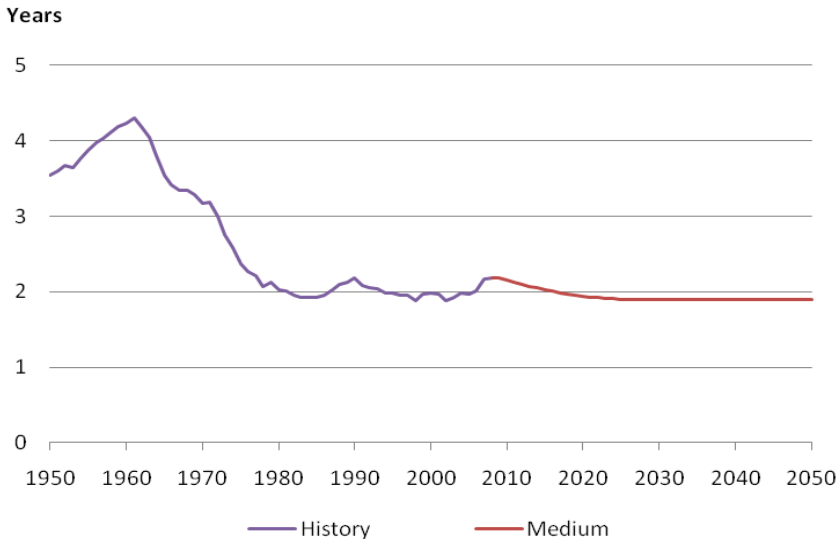
3 Population ageing

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.

Compared with all the policy uncertainty around future health, education, justice, welfare spending, and taxation, population projections are far more certain. People in the Post-World War II baby boom bulge are now aged between 45 and 65. We have a good grasp on how many will be around over the next 40 or so years.

SNZ 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 medium long-term assumption is for 1.9 children per woman.

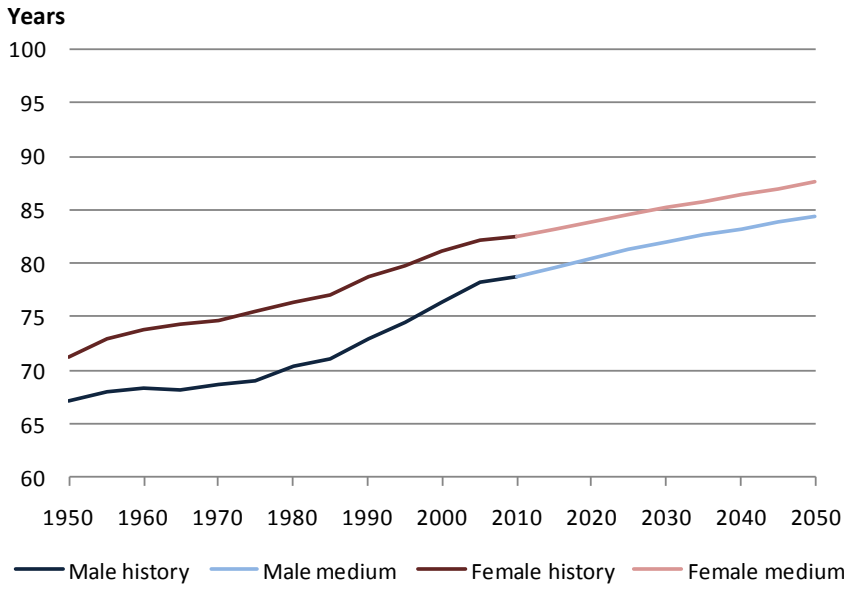
Figure 1 – Total fertility rate, 1950-2050



Source: Statistics New Zealand
Note: 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.

Mortality rates have been falling for decades and this fall shows up as rising life expectancy. Since 1950, life expectancy at birth 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 that has been bought up about our projections is that life expectancy assumptions may be too low and, if true, we may be underestimating the fiscal costs of ageing.

Figure 2 – Life expectancy at birth, 1950-2050

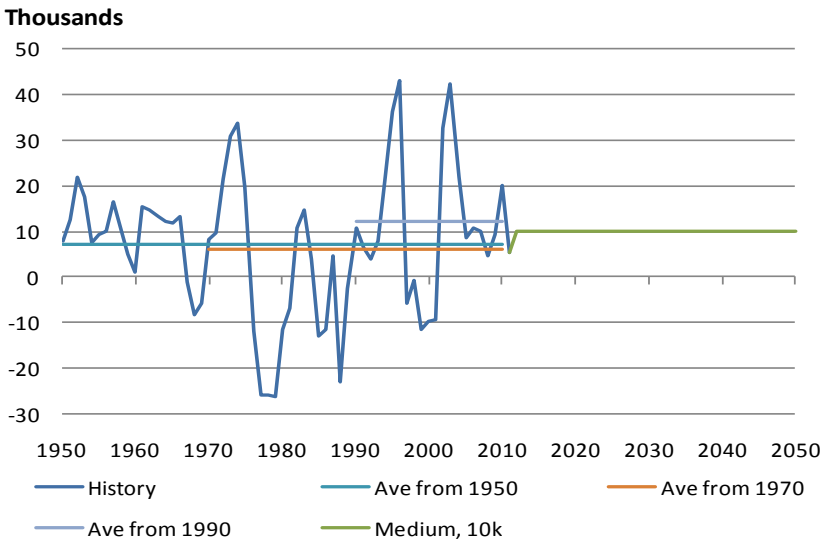


Source: Statistics New Zealand

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 on the numbers of returning Kiwis and families of former migrants. 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, higher migration tends to reduce slightly the effects of ageing over the long term.

Figure 3 – Net migration, 1950-2050



Source: Statistics New Zealand

Statistics New Zealand publishes nine official population projections using combinations of the three sets of input assumptions. 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 the agency feels best represents our longer-term population prospects and that is what we use here as our base-case. The table below show under this scenario the population grow by 30% over the next 40 years and the ratio of those 65 and older to those 15-64 doubles over this time.

Table 2 – Medium population projection, assumptions and results

Medium (Series 5)	2009	2010	2020	2030	2040	2050
TFR	2.12	2.16	1.94	1.90	1.90	1.90
e0 Male	78.4	78.8	80.5	82.0	83.3	84.4
e0 Female	82.4	82.5	83.9	85.2	86.4	87.5
Migration	12.5	25.0	10.0	10.0	10.0	10.0
Population	4.32	4.43	4.82	5.15	5.40	5.60
ODR	19.3	20.0	26.0	34.0	38.0	39.0
Median age	36.5	36.8	38.1	40.2	41.8	42.6

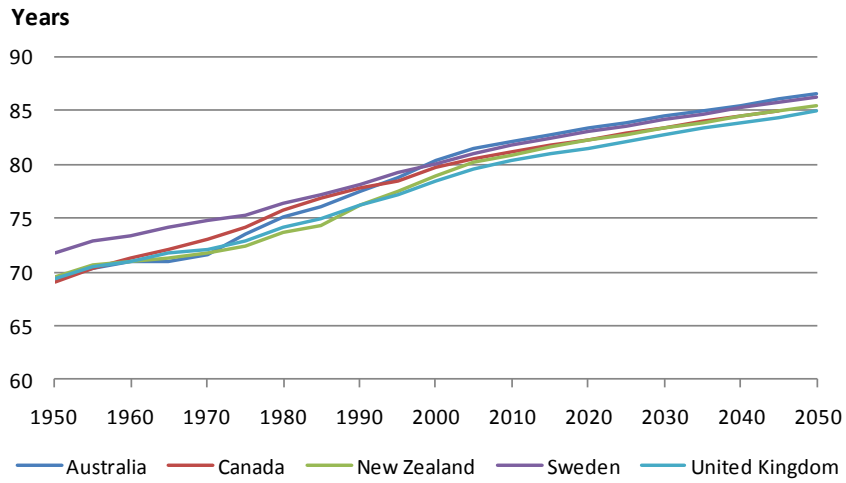
Source: Statistics New Zealand
Notes: 2009 is the base year for the projections (June years). The assumptions are: TFR is total fertility rate (children per woman); e0 is life expectancy at birth in years; Net migration in thousands. The results are: Population in millions; ODR is the old dependency 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.

3.1 How does the SNZ medium life expectancy assumption compare with other countries'?

Across the OECD, New Zealand is in the mid-ageing group of countries as measured by the rise in the ratio of the numbers 65 and older relative to those between 15 and 64 (the narrow definition of working age population).

It is admittedly difficult to compare countries with different demographic history and ethnic mixes. However, in the UN projections (Figure 4 below), Australia, and Sweden have life expectancy assumptions in 2050 about a year greater than New Zealand, Canada is very similar while the UK projections are 0.6 year lower in 2060. SNZ has a medium projection assumption for New Zealand that is half a year higher than the UN one in 2050. This might give some comfort that our medium life expectancy assumption is not too out of line with trends in similar countries.

Figure 4 – Life expectancy at birth, both sexes combined, 1950-2050



Source: United Nations, World Population Prospects: The 2010 Revision, http://esa.un.org/unpd/wpp/index.htm,

3.2 Ways of representing uncertainty around the medium projection

To illustrate the spread of uncertainty around the medium population projection, we have generally used some of the official scenarios SNZ prepares. Another approach is to use stochastic projections to capture spread of uncertainty around the medium projection (Series 5). Dunstan (2011) has published experimental stochastic population projections around the medium series with the idea of providing a quantification of the likelihood of the official (deterministic) scenarios. This shows that the official scenarios often give a poor indication of reasonable spread of uncertainty for some key demographic summary measures such old dependency ratio, and the share of 65 and older in the total population. Uncertainty is not uniform through time, nor is the uncertainty symmetric around the deterministic medium projection. After briefly using the stochastic approach in the work leading up the 2006 long-term projections, we did not use them in the 2009 projections, but we may take up the stochastic approach to uncertainty again in our future work.

4 Long-term fiscal modelling framework

This section provides a brief description of the Long-term Fiscal Model (LTFM) 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) uses the latest five-year update economic and fiscal forecasts as its base for projections.

4.1 How we project nominal GDP

The macroeconomic forecast aims to reach a potential growth track by the last year of the five-year forecast. 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 NZTM forecasts as a guide for projected (real) GDP.

The LTFM uses the PPP framework to project GDP. From the demographic projection (population is the first P), 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. The oldest group is the open-ended 65-and-older group. The ageing of the population produces a slowing of labour force growth.

This is then multiplied by the average hours worked (derived from history) to get a projection of total hours worked. Total hours worked are then multiplied by an average growth rate of output per hour (productivity, the third P, again based on an historical average – here assumed at 1.5% a year as the long-term average). The result is a projected track of real GDP. Inflation at the current mid-band policy rate of 2% a year is applied to this estimate to arrive at nominal GDP.

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.

4.2 How we project revenues, expenses and debt

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 which also include these entities.

Growth of spending on transfers (such as welfare benefits or NZS) is the sum of an inflation factor, and the growth the number of recipients by age. 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; otherwise it grows the same as the net wage. For the projection period, where consumer prices and wages maintain their relativity, NZS payments grow with the average wage. Recipient numbers grow with the numbers of people 65 and older. Welfare benefits are assumed to grow by CPI inflation.

Population ageing shows up in the growing amount of time a person receives the public pension. On average a person received the universal pension for about 14 years in the 1950s. his has risen to about 20 years now and could rise a further five years by 2060. (These estimates are based on life expectancy at 65 calculated in a single year. Of course, with falling mortality rates, this will mean rising life expectancy each year. So that five-year increase is likely to be conservative.) 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 40 years' time.

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. "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. The generic formula (derived in Bell, et al., 2010) for nominal spending, E_t, is:

$$E_t / E_{t-1} = (1 + \pi_t)(1 + w_t)(1/(1 + a_t))(1 + d_t)(1 + p_t)$$

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 personal health (primary, secondary and tertiary), which amounts to about $9.5 billion of the present $12.5 billion health bill, are assumed to shift down slowly over time to reflect an assumption of healthy ageing and so the d_t factors in this case are complicated.

Tax projection methodology is discussed in Section 5. The revenue and spending projections are aggregated into an operating balance. An operating deficit and any capital deficit are added to existing debt, while surpluses reduce debt. When net debt is unconstrained, and all growth parameters depend on historic estimates, the projection is called the *Historic Trends* scenario. On the other hand, if the long-term net debt is set at a level of GDP (such as the current Fiscal Strategy target of 20%), and the model is run to allow some tax or spending parameters to be adjusted to make the net debt fit the pre-assigned track then, we call this a sustainable debt scenario. These parameters include the spending on some programme, or an operating allowance, or spending growth parameters or tax rates.

The strengths of this approach to fiscal modelling are that it follows the breakout of the budget documents. The historic trends approach is what most countries around the world do to show the pressures of ageing on their projected fiscal position. The *Sustainable Debt* approach 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 see 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.

A 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 sustainable 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 sustainable 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.

The 2009 statement showed that without changing transfers from current settings a sustainable fiscal position could be reached if the amount of real services from other spending were reduced for each person to about 90% of the amount in 2013 by 2023 and then gradually increased to about the 2013 level in 2050. Another way to construct debt-constrained projections is to extend the allowances used in setting budgets to the middle of the century and ask what would the allowances need to be to reach a net debt ratio of 20% in the long term

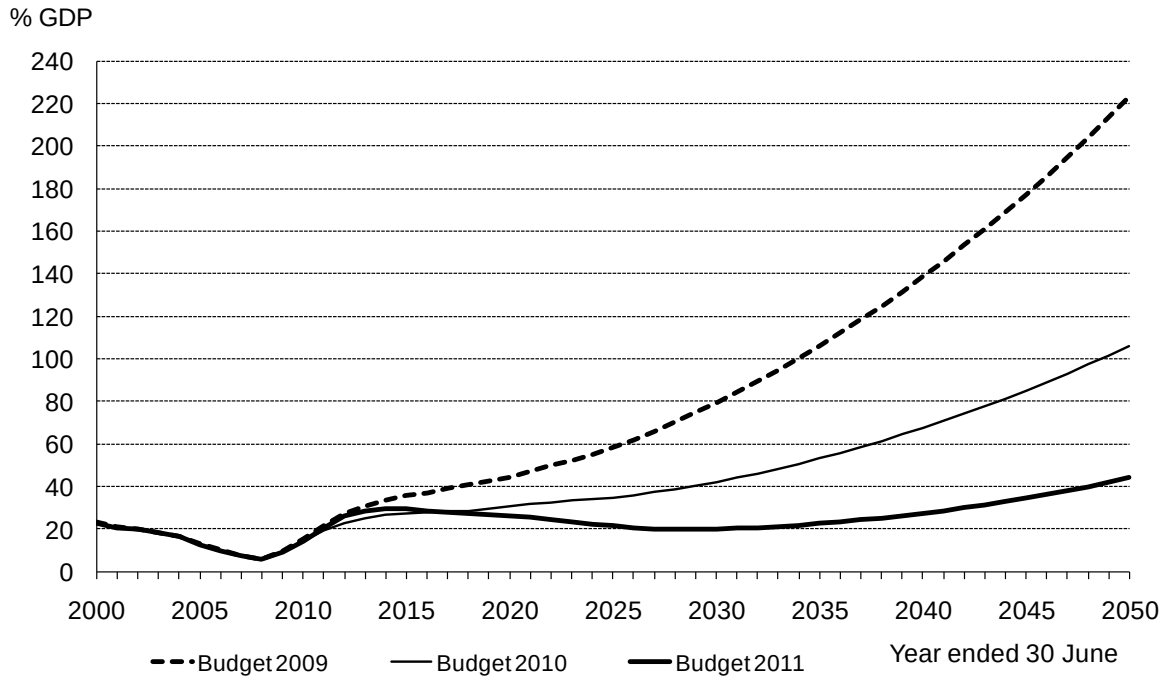
5 Long-term fiscal projections from three consecutive budgets

Challenges and Choices (Treasury, 2009) uses a 2009 Budget forecast base, which was heavily influenced by the onset of the global financial crisis (GFC). It is fair to say that this produced a rather grim picture of New Zealand's potential future fiscal path. Under the *historic trends* scenario, which projects expenditure from the forecast base using demographic, inflation, wage, productivity and non-demographic demand factors, net core Crown debt rose to 223% of nominal GDP by 2050.

While not part of official LTF Statements, as these are only published every three to four years, updated long-term projections were done when the 2010 and 2011 Budget forecasts were prepared. The Historic Trends projection logic applied to these latter Budget forecast bases was very similar to that used in the 2009 LTF modelling. Despite this, the resulting net debt paths were quite different, at least in regard to the level of net debt to GDP reached by 2050.

All figures in the section come from use of the Treasury's Long-term Fiscal Model.

Figure 5 – Net core Crown debt to GDP – three budget projections



The Budget 2010 projection reaches 106% of GDP in 2050, while the Budget 2011 version has reduced to only 44% by this year. The net debt projection has more than halved, by 2050, at each consecutive Budget update.

It would be understandable, without delving more deeply into why this has occurred, to conclude a couple of things from the above figure:

- The methodology behind these projections is flawed, or if not error-ridden, then based on dubious assumptions; and
- According to the latest projection, any problems with NZ's long-term fiscal position are far enough into the future to require no current policy responses.

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

5.1 The logic of *Historic Trends projections*

The *Historic Trends* projection logic, which lies behind the three net debt projections shown in the Figure 5, should not be viewed as a forecast of New Zealand's likely future fiscal position. It operates in the absence of policy responses, so provides an indication of the trend towards which current policies are leading.

It can be viewed as a warning signal, basically stating, "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 unsustainable 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 *Historic Trends* projection suggests? Of course not – it is unlikely that even the 44% ratio of the latest Budget projection would be allowed to occur. Governments of the future would cut spending, raise taxes or possibly do both to avoid such situations.

History shows that New Zealand policy makers do not allow public debt to rise unchecked. This is evident in the reduction of gross sovereign-issued debt from over 75% of nominal GDP in 1987 to under 21% by 2008. It is also shown in the recent policy responses to the lift in debt caused by the GFC. These have played a big role, as shall be examined in this section, in reducing the net debt track between Budget 2009 and Budget 2011.

But, to repeat, these *Historic Trends* 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.

5.2 The mechanics of *Historic Trends* projections and some definitions

Core Crown borrowings, or gross debt, are the residual of *Historic Trends* projections. By this it is meant that the modelling projects various forms of revenue, expenditure, assets and non-debt liabilities, and the path of debt results from bringing these together via the accountancy relationship (Δ signifies the annual change in the following variable):

$$\Delta \text{ gross debt} = \Delta \text{ assets} - \Delta \text{ non-debt liabilities} - \text{operating balance}$$

As net debt is derived from gross debt by removing a defined set of financial assets, this relationship could be expressed as:

Δ net debt = Δ all assets – Δ subtracted financial assets

– Δ non-debt liabilities – operating balance

= Δ assets that add to net debt – Δ non-debt liabilities – operating balance

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

Operating balance = tax revenue + other non-investment revenue + investment revenue and unrealised gains/(losses)
– non-debt financing expenses – debt-financing costs

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 in the areas of health, education, welfare, justice, defence, core government services, economic/industrial services and several other classifications.

A subset of the operating balance, called the primary balance is defined as:

Tax revenue + other non-investment revenue – non-debt-financing expenses

This measure of surplus/deficit can be used to focus on revenue and expenses that are not directly sourced from assets and liabilities. In particular, when debt is the residual of the modelling as it is in *Historic Trends* projections, use of a primary balance isolates the impact of debt financing costs from all other forms of public expenditure.

Investment income and unrealised gains are removed to provide symmetry. If the costs of holding a "negative asset" i.e. the debt liability, are excluded from the expense side of a surplus/deficit measure, then so the forms of revenue from holding assets, such as investment income, should be subtracted from the revenue side.

Obviously the primary balance impacts on net debt in the same direction as the operating balance i.e. surpluses reduce net debt, while deficits add to it.

Making debt the residual is not the only way of modelling fiscal projections. A later section of this paper looks at a projection where the net debt path remains constant at 20% of GDP. To do this the components of non-debt financing expenses that are grown via a share of an operating allowance in a budget process are constrained. This is basically all non-debt financing expenses other than welfare spending.

Effectively the relationship is rearranged to make these expense types the subject, via:

Operating allowance-covered expenses = Δ net debt + Δ non-debt liabilities
– Δ assets that add to net debt – welfare expenses – debt-financing costs
+ tax revenue + other non-investment revenue
+ investment revenue and unrealised gains/(losses)

5.3 Tax revenue projection logic in the long-term fiscal projections

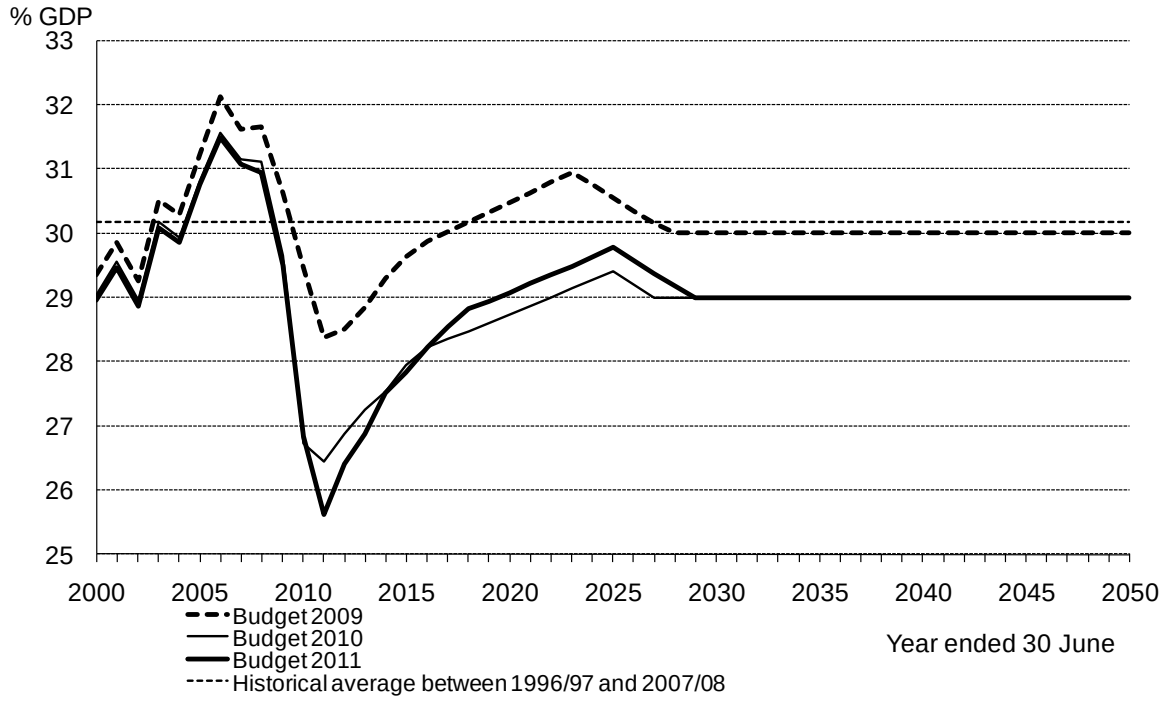
To avoid affecting the flow of later sections, the logic of how long-term projections of tax revenue are produced is covered here. The necessity of understanding this will be more evident when the impact of each Budget's primary balance on their respective net debt tracks is examined. The upward turn in each track, 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. If this were not done and fiscal drag modelling extended out to 2050, the Budget 2009 net debt projection would have only risen to 96% of GDP, rather than 223%. The respective differences for Budget 2010 and 2011 projections would be 23% instead of 106%, and –51% instead of 44%.

Three major tax types are modelled in the projections, namely source deductions, corporate tax and other taxes. Source deductions are the taxes withheld on salaries and wages, some welfare benefits, NZS, and superannuation fund contributions. It 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.

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 other taxes 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 impacts are 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.

Figure 6 – Core Crow tax revenue to GDP – three budget projections



The graph above shows the three Budgets' long-term projections of core Crown tax revenue, as well as the historical average ratio to nominal GDP, between 1997[2] and 2008, of 30.2%.

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 stated, Budget 2010 included a tax package which cut personal tax rates and raised the GST rate. 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 Treasury's estimate was that 1 percentage point was appropriate.

The lift above the long-term ratio, be it 30% in Budget 2009 or 29% in the later Budgets, is due to source deductions. This too is eventually brought to a long-term GDP ratio, but not from the very start of projections. For the first decade of projections it is subject to fiscal drag modelling. This is to acknowledge that, under a tiered tax regime where tax rates lift at each income threshold used, tax grows faster than the income that generates it. The name refers to the effect this has of removing aggregate demand i.e. as individuals earn more, their after-tax income does not rise at the same rate. As source deductions is personal income tax and the NZ personal tax regime has 4 income thresholds with higher tax rates above each, it is subject to fiscal drag.

[2] Tax data prior to 1997 have not been back-dated to reflect the International Financial Reporting Standards (IFRS) accountancy 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.

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 rule has to be applied while both reflecting the history of tax policy and applying common sense.

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

The common sense aspect simply reflects that, even those on the lowest incomes, such as beneficiaries, would be facing the top 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 of the Budget projections examined here, being most pronounced at Budget 2011.

5.4 What hasn't changed much between Budget 2009 and now?

Before examining the main factors that have caused the net debt projections to alter so radically over the last three Budgets, this section rules out those that have made little difference. This will help to focus on the areas to which these projections are most sensitive, and ensure no unanswered questions remain about the influence of other factors that contribute to the modelled growth of net debt.

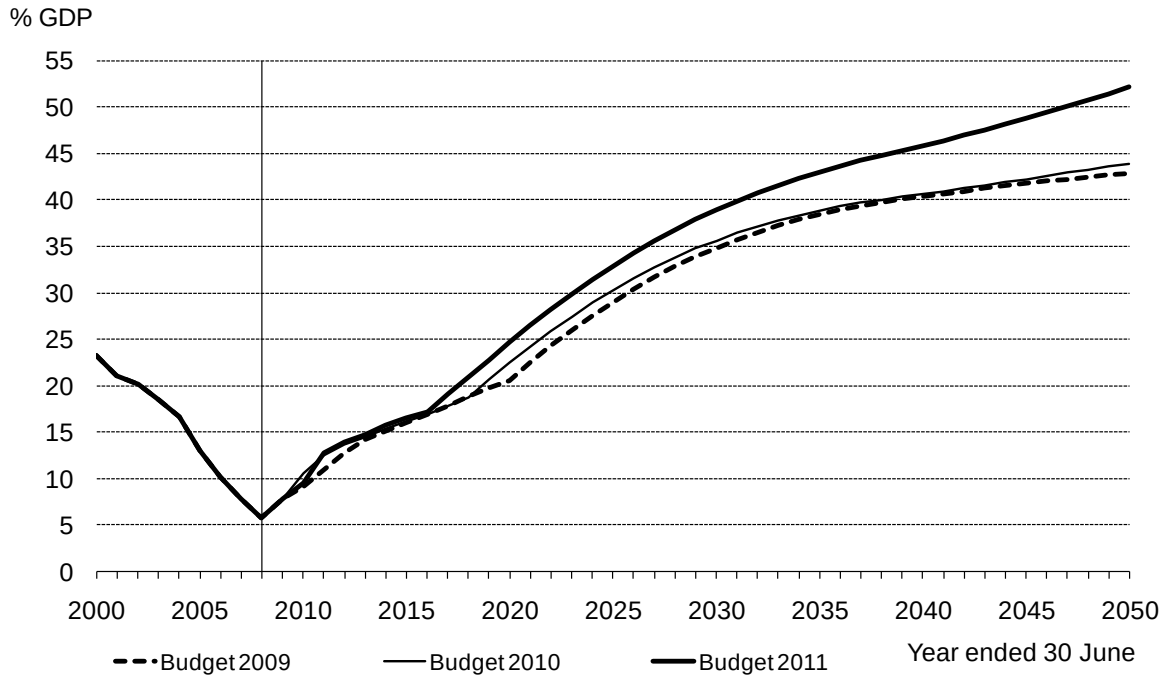
So what has not changed net debt much in the three consecutive Budget projections? The answer is both the growth of core Crown assets and non-debt liabilities. That is most easily communicated graphically, but the graphs used need some explanation.

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

To produce the graph, both the Δ non-debt liabilities and the operating balance are treated as if they were both zero in all three Budget projections. 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 graphs. The purpose of isolating the contribution of asset growth to each of the three Budget's net debt projections is to depict how much, or how little, it accounts for the differences.

Unfortunately nominal GDP does get frequently revised in history. As the focus is on net debt to GDP, rather than nominal net debt, a common GDP denominator is needed. The Budget 2009 nominal GDP track is used as the common denominator in all of these graphs that depict contributions to change in the net debt track. The contribution arising from a different GDP denominator in the later Budget projections is shown later.

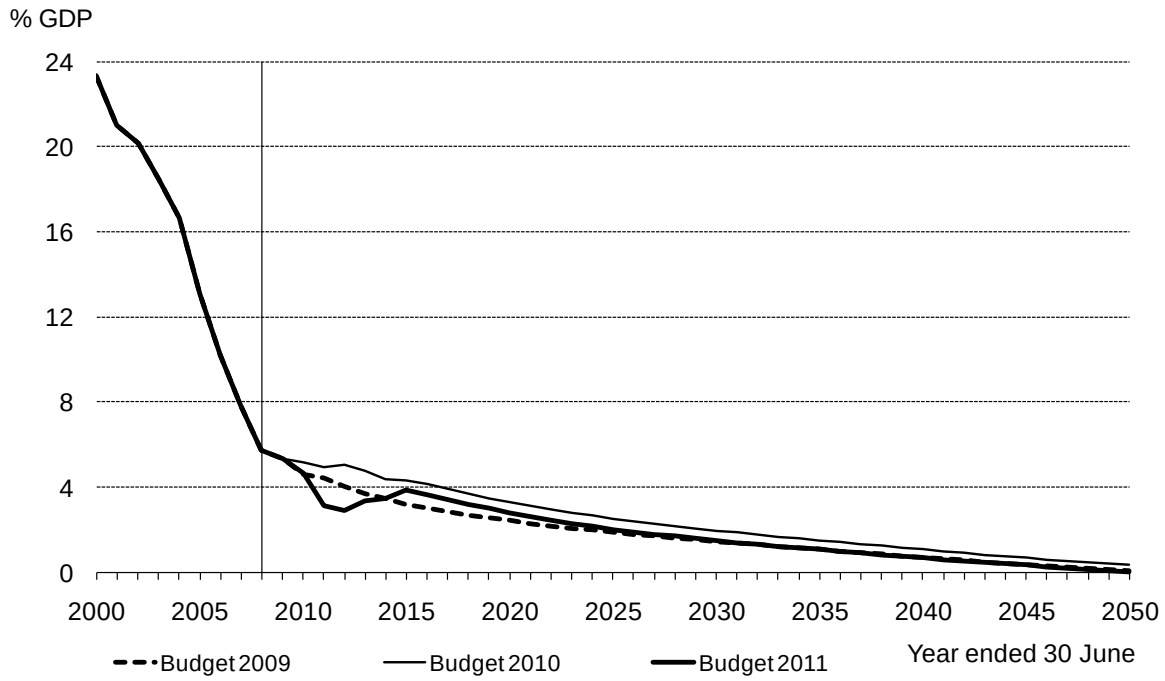
Figure 7 – Net Core Crown Debt to Budget 2009 GDP – Contribution from three Budget projections of asset growth from 2008 base



As the graph shows, the difference to the net debt tracks produced by asset growth is barely discernible between the Budget 2009 and 2010 projections. By 2050 the Budget 2011 asset growth projection adds around 8 percentage points more to net debt than for either of the others. As the Budget 2011 net debt track was the lowest of the three and the graph indicates that asset growth changes have actually acted to lift it, other factors must have had to offset the rise of net debt in this projection even more. It would appear that the asset forecast bases and asset growth projections of the three Budgets are not significant contributors to their net debt path differences.

The next graph 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 reduces net debt, as they cover potential expenses that may otherwise have to be met from increased borrowings.

Figure 8 - Net Core Crown Debt to Budget 2009 GDP – Contribution from three Budget projections of non-debt liability growth from 2008 base



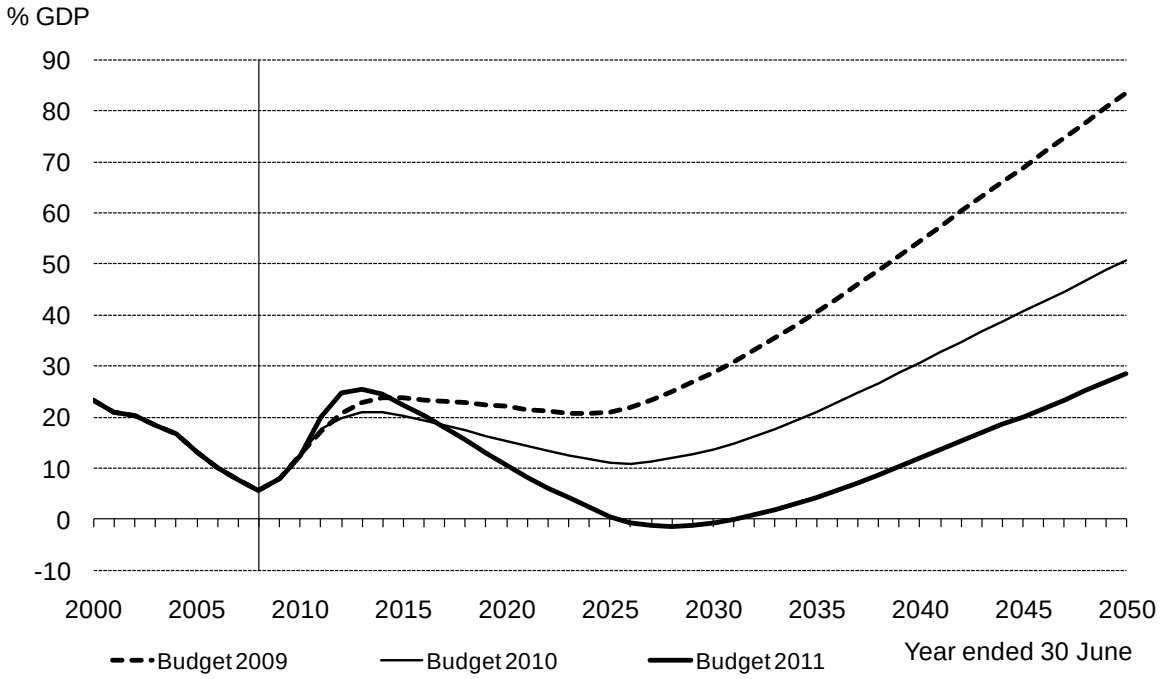
Even more than is the case with assets, the non-debt liabilities projections of the three Budgets are quite similar and their contribution to net debt track differences is very small. This is not surprising, as in 2010 the value of core Crown non-debt liabilities was less than 20% that of core Crown assets and around 40% the value of debt.

5.5 What has driven the differences in the net debt tracks from Budget 2009 to now?

The simple answer is that it is the timing of when ongoing deficits begin. These determine the impact on net debt, via both how large the primary deficits themselves are and how big are the ensuing debt financing costs they produce, up to the arbitrary end point of these projections, the year ended 30 June 2050.

The next graph shows the impact of each Budget's primary balance on their respective net debt tracks. As was mentioned in explaining the reason for going into tax projection logic earlier, the upward turn in each track is heavily influenced by ceasing fiscal drag modelling and gradually returning source deductions to a long-term average GDP ratio.

Figure 9 - Net Core Crown Debt to Budget 2009 GDP – Contribution from three Budget projections of primary balance from 2008 base

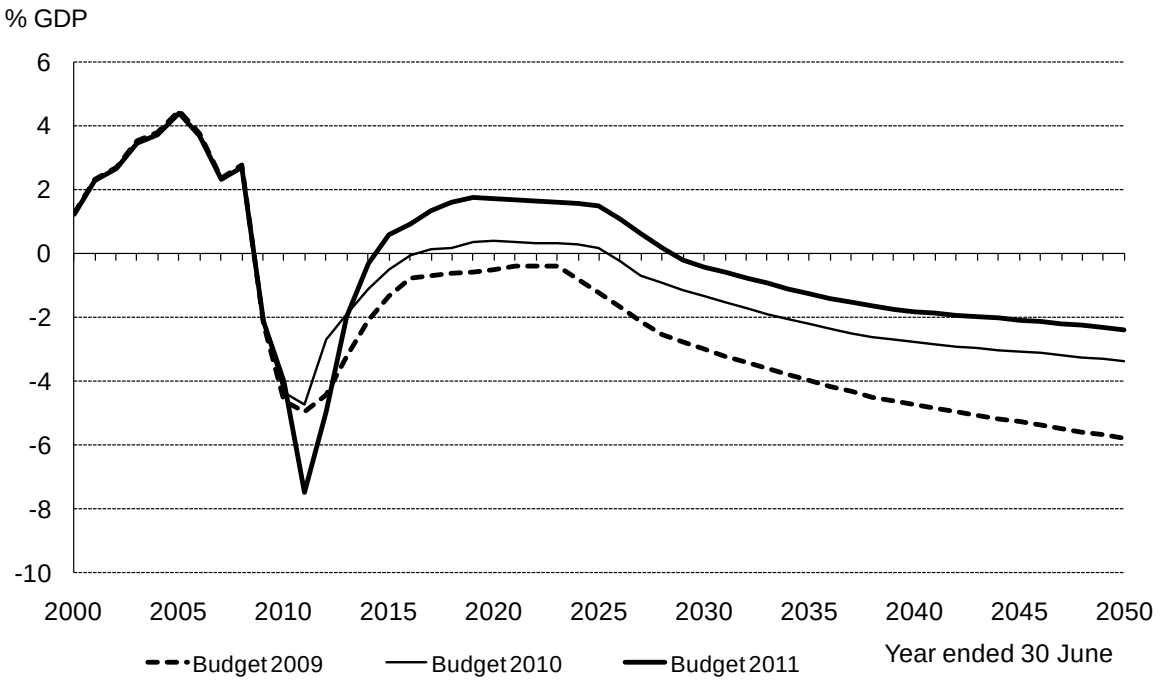


The other thing obvious from this graph is that, unlike the growth of assets and non-debt liabilities, there are clear differences between how each Budget's primary balance track has affected the net debt tracks. The graph below, showing the primary balance tracks themselves, may help to clarify points in the following discussion.

For Budget 2009, there is a very small negative effect from the primary balance on net debt from around 2013 to 2023, after the deficits of the forecast base recover somewhat. This corresponds to a period where 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, cause 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 not markedly dissimilar 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 serves to more than stabilise net debt, but rather helps to drive it down by around 10 percentage points of GDP. However, once tax stabilises, 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 do 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 about 2/3 the lift seen for Budget 2009 over the same 25 years.

Figure 10 - Core Crown primary balance to GDP – three Budget projections



Finally, the Budget 2011 primary balance projection is yet another step up, although the ultimate 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 now 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.

That explains the mechanics of how the respective primary balance tracks impact on net debt, but it does not fully explain why the primary balance tracks themselves get progressively stronger. Interestingly, the reasons are different in moving from Budget 2009 to Budget 2010 and then on to Budget 2011. The first transition is mainly a stronger revenue story, arising from an improved economic outlook. The second owes more to expense reductions, stemming mainly 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 impacts of inflation. Everyone knows that being a millionaire today means nowhere near what it did in the 1970s! However, what matters in moving from surplus to deficit are the nominal revenue and expense levels. Different nominal GDP denominators can make it hard to compare revenue and expense projections from different Budget bases.

Hence the next two graphs depict the nominal levels of tax and non-investment income and of expenses excluding debt financing costs for the three consecutive Budgets. As the sheer scale of the growth in nominal values between 1999/00 and 2049/50 make small differences hard to discern, the graphs are limited to between a common starting point of 2008 and the projected year 2033. Dollar values by this year are still such that the vertical

axis is not so wide ranging as to obscure projection differences. Also the endpoint is far enough into projections that the revenue and expense paths are established and will clearly not move much further apart than they already have.

The two graphs illustrate a few points, in particular:

- As indicated above, Budget 2009 has a lower tax revenue and non-investment income track than the later two Budget projections, which are quite similar.
- Also as pointed out earlier, the tracks of expenses, excluding debt financing costs, for the first two Budgets are almost overlaid, while that of Budget 2011 is lower from around 2013 onwards.
- The expense tracks for all three Budgets follow very similar growth paths. The difference between Budget 2011 and the other two arises from changes in the forecast base from which the projections grow. This shows that no substantial changes have been made to how the expenses are projected in these Budgets.
- The revenue tracks also follow relatively similar paths, although the gap between Budget 2009 and the other two does slowly widen over time.

Figure 11 - Core Crown tax revenue and other non-investment income in nominal dollar values – three Budget projections

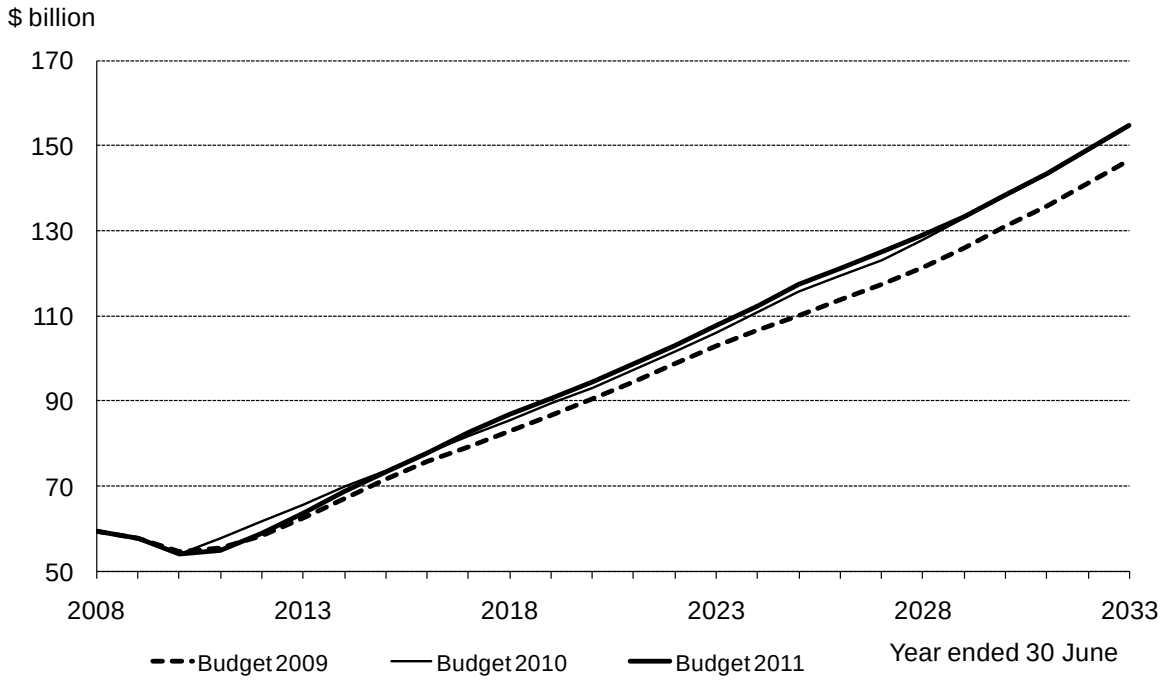
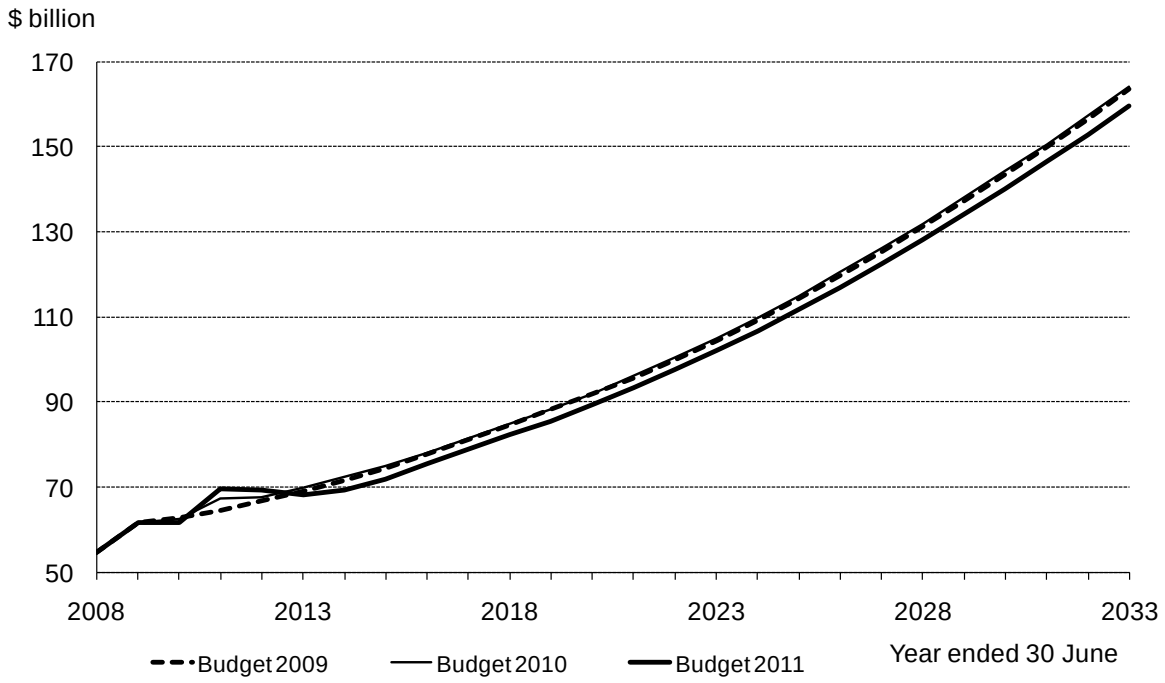


Figure 12 – Core Crown expenses, excluding debt financing costs in nominal dollar values – three Budget projections



What has caused these revenue and expense track differences (and similarities)?

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 nominal GDP tracks for Budget 2010 and 2011 are quite similar over the projection horizon. Hence, with even source deductions being returned to the same long-term tax to GDP ratio, 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, not just in NZ but around the world, as to how things would develop, forecasts of economic growth were understandably subdued. Later GDP forecasts were more optimistic, as economic and fiscal data showed NZ was faring better than Budget 2009 had predicted. Another factor that boosted 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 that follow them.

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 etc 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 slightly grow across the projections.

The substantial differences in the non-debt financing expenditure tracks occur between Budgets 2010 and 2011, with the Budget 2009 track being very similar to that of Budget 2010. This is far more of a policy decision story than an economic growth story.

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 in 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 justice, defence etc spending. 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.

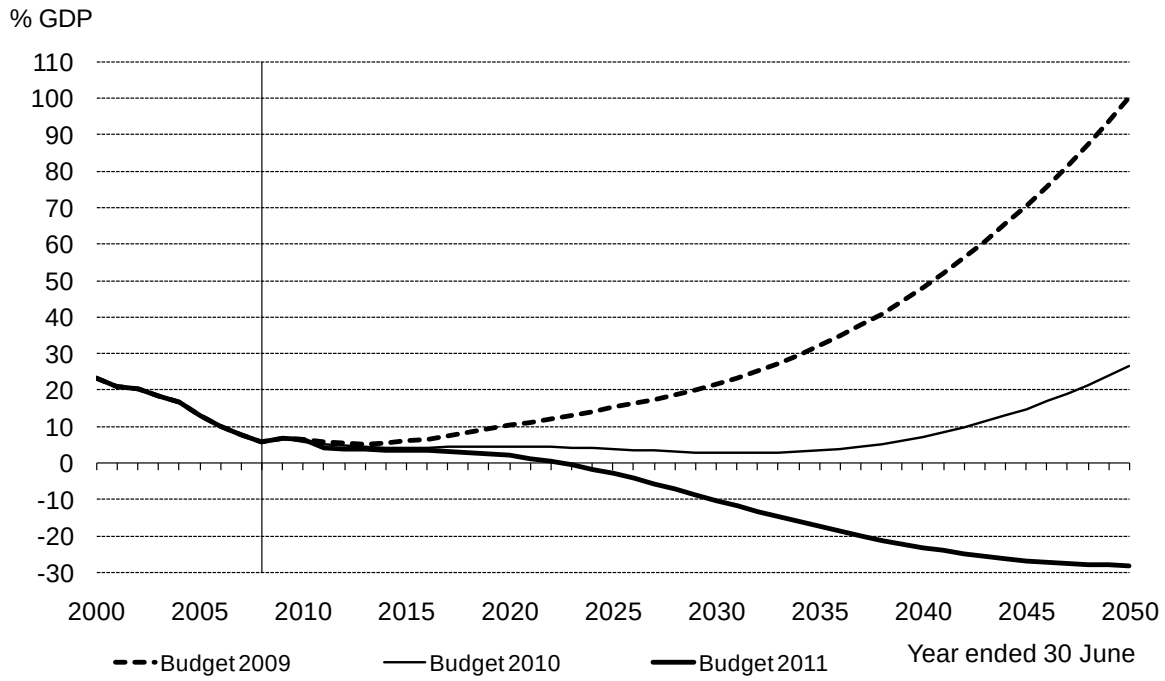
This time it is Budget 2011 that provides the different story. The forecast base of this Budget included decisions by the current Government to substantially decrease allowances for new operating spending. More is written about these in a later section but it suffices for now to say that they substantially lowered the Budget 2011 forecast expenditure base 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 result 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, this was dwarfed by the spending decreases in other areas (and that does not include radically reduced debt financing costs).

Putting 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, due 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.

Now that the impact of the primary balance on the net debt tracks, and why this occurs, is clearer, an even bigger effect arising from ongoing deficits can be examined. This is the impact of the debt financing costs, or more specifically the debt financing costs less investment income and unrealised gains/(losses), although it is definitely the former that really make the difference to the net debt projections.

The next graph illustrates this impact on the three consecutive Budget net debt tracks.

Figure 13 - Net Core Crown Debt to Budget 2009 GDP – Contribution from three Budget projections of debt-financing costs less investment income & gains from 2008 base

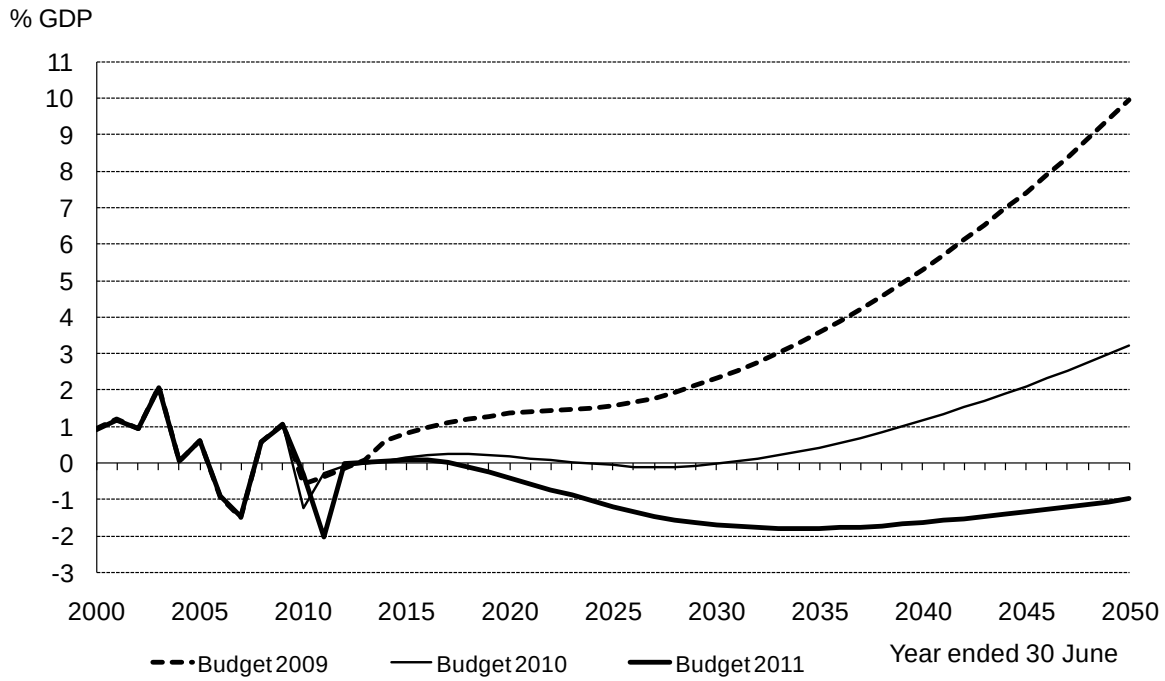


The graph of the three Budgets' different tracks of debt financing costs less investment income and unrealised gains/(losses), shown below, will aid the following explanation. This graph has been displayed in this order, rather than the more usual *revenue less expenses* sequence, because this corresponds to the same direction of impact on net debt as is illustrated in the graph above.

Having explained what has led to the different primary balance tracks, the reasons for the different debt financing costs tracks are easy to outline. And it is a case of large differences in debt financing costs, rather than any major divergence in investment income and unrealised gains/(losses). The asset-derived revenue streams do differ in each of the three Budget projections, but their differences are dwarfed by those of the debt financing cost tracks. To illustrate, 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.

What causes the debt financing costs to be so different that, by 2050, they are the biggest major expense class for the Budget 2009 projection, more than either health or NZS, but easily the smallest spending category for the Budget 2011 track? The answer lies in the different primary balance tracks, or more specifically, in the difference in timing of ongoing primary deficits in the three Budget projections.

Figure 14 - Core Crown debt-financing costs less investment income and unrealised gains/(losses) to GDP three Budget projections



As has been discussed, the Budget 2009 primary balance never gets back to surplus, although it does improve from its GFC-induced nadir in 2009/10, until around 2023. With no surpluses to help reduce the debt stock, the latter continues to increase and hence so do the financing costs it generates. When primary deficits start growing again after 2023, this "debt begets debt" cycle accelerates. Bigger deficits accelerate the growth of borrowings, which pushes up the debt financing costs that the debt stock generates, which in turn cause the total operating deficits to become even larger. As these *Historic Trends* projections allow for no policy response, this cycle just keeps accelerating, pushing debt financing costs up much faster than any other expense class or any revenue stream, and adding cumulatively to a rapidly growing debt stock.

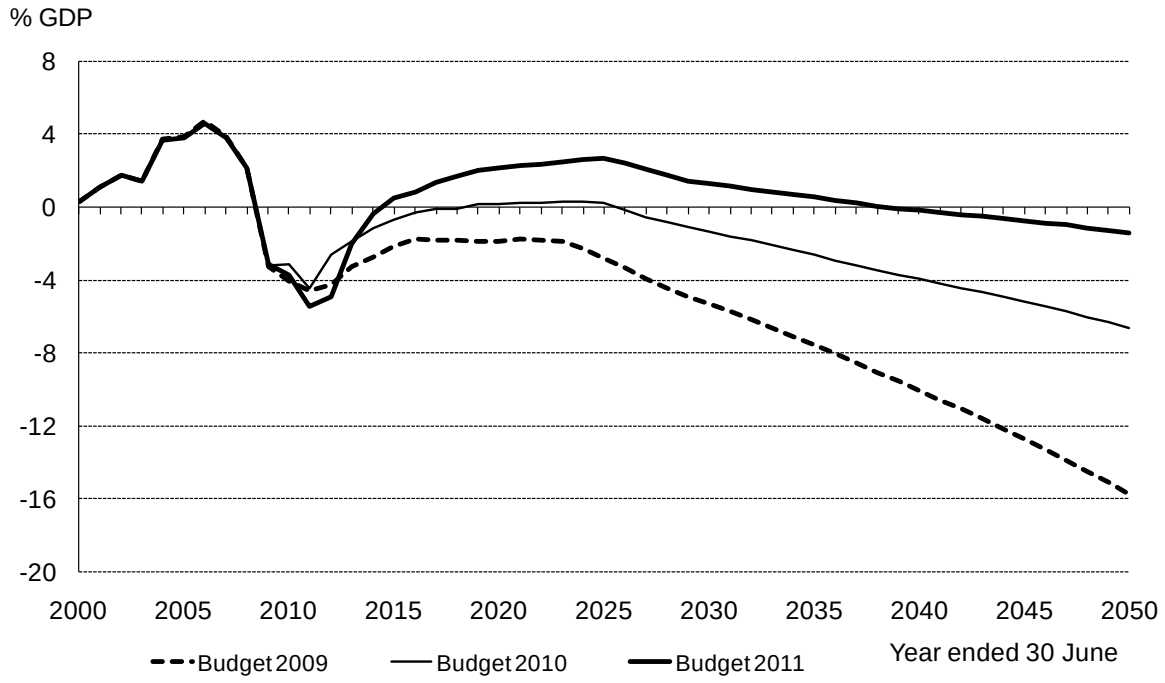
The Budget 2010 primary balance projection, aided by stronger tax revenue than the Budget 2009 track was, does manage to get back to surplus between 2017 and 2025. The primary surpluses are not strong enough to produce operating surpluses for very long, i.e. combined with investment income and unrealised gains, they only rise enough to just overcome debt financing costs for a few years, but they do help to slow the growth of debt. In doing this, they also slow the growth of debt financing costs over this period. Around 2026 primary deficits return, as expense growth overtakes flattening revenue, and the debt cycle described above begins. However, because this starts later than in the Budget 2009 projection, both debt levels and the debt financing costs they produce never become as large in any projected year, including by the end of projections in 2050.

Finally, as has been discussed, the Budget 2011 primary balance is stronger than both of its preceding Budgets' projections, as the revenue track is stronger than 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. The debt cycle described above does start from this point onwards, but it only has 12 years to impact before 2050. Consequently, debt levels and debt financing costs do rise over this final decade of the Budget 2011 projections, but from a much lower base and with far less time to accelerate upwards.

The next graph 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 15 - Core Crown operating balance to GDP - three Budget projections



This graph also contains a warning signal pertaining 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 more than doubles.

5.6 Reasons for policy change now

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

When the Budget 2009 LTF Statement was produced, with its net debt curve steadily rising to an inconceivable 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 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, it was hopefully to indicate that 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 NZ economy have proved, at least so far, to not have been as severe as was feared. The GDP base has been revised up by

Statistics NZ and the outlook for growth is higher. Ironically, even the tragedy of Christchurch, while hitting the government's accounts hard at present, is expected to stimulate the economy over the next few years as the city is rebuilt.

This was not all due to fortuitous outcomes without any policy changes accompanying them. This paper has already explained that 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 this Budget and the next two, as well as 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. In other words, the present government made policy responses to avoid worsening deficits and these have improved both the short-term and long-term fiscal positions.

There is a message in this for policy makers around 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 ramifications 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. Around the world there are a number of economies in serious difficulty, like Greece and Ireland, and some of our major trading partners, like the United States and Britain, are still dealing with large deficits. Another global downturn occurring in the near future cannot be discounted and if it does, the NZ economy will be affected. Closer to home we also have problems. The situation in Christchurch is very unsure and more earthquakes, apart from the human tragedies involved, could add to public expenses and delay reconstruction, and hence the boost to economic activity that is expected to provide. The NZ economy has imbalances, like persistent current account deficits and an over reliance on the non-tradable sector. These leave as vulnerable to events largely beyond our control, such as reduced international demand for dairy products, which could worsen our fiscal position and damage our prospects for growth. If the forecast base deteriorates, for any of these reasons or from numerous other possibilities, then the analysis in this paper makes it clear that so will the long-term fiscal projections.

Another reason why fiscal consolidation has been occurring recently is to restore the 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 lowered tax and other revenue streams and increased expenses, to which the Christchurch earthquakes have added recently. But, unlike some other nations who were impacted far worse than NZ, we had some room to move. NZ's 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 NZ 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 NZ 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 wisely, such as paying down debt to restore the buffer, they will help. But, unfortunately, there is no guarantee that will occur. People tire of having to tighten their belts, governments want to get re-elected and oppositions want to get into power. As a result, periods of fiscal constraint do not normally last too 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, but its increase in the same period was 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 means Kiwis will receive less in publicly funded goods and services.=

The electorate may be willing to accept this for a few years, especially when the memories of the GFC are fresh in their minds and the obvious needs of dealing with the situation in Christchurch are paramount. But the *Historic Trends* projection logic not only allows 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 populace. 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.

Figure 16 - Core Crown health expenditure to GDP

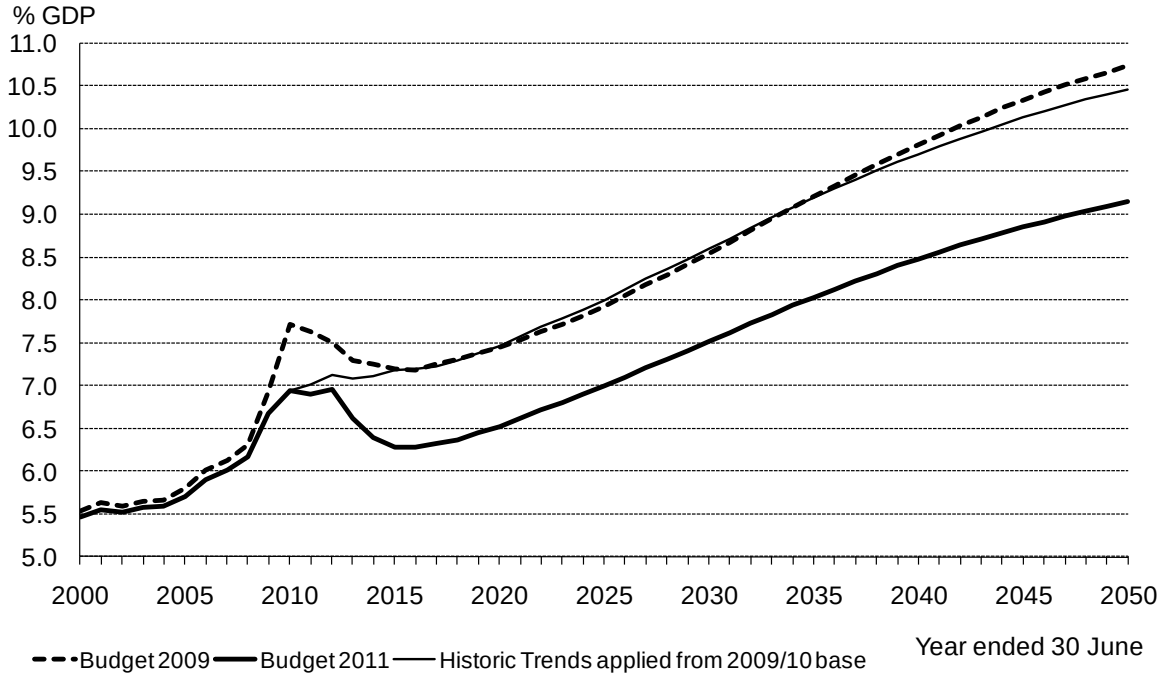
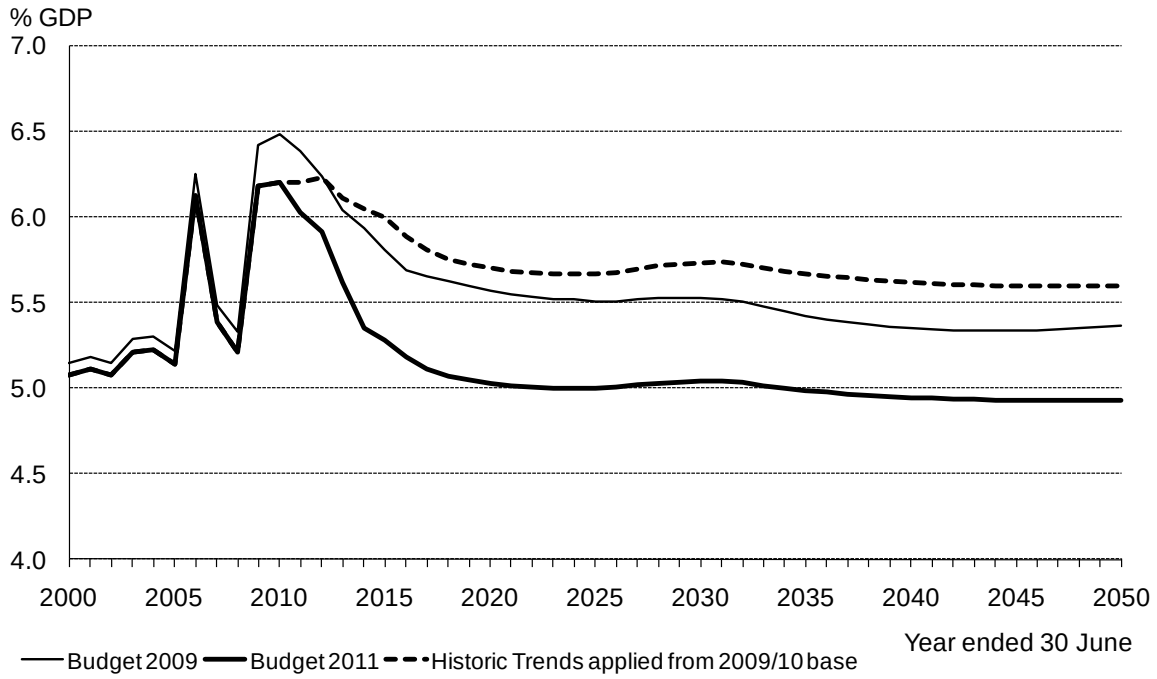
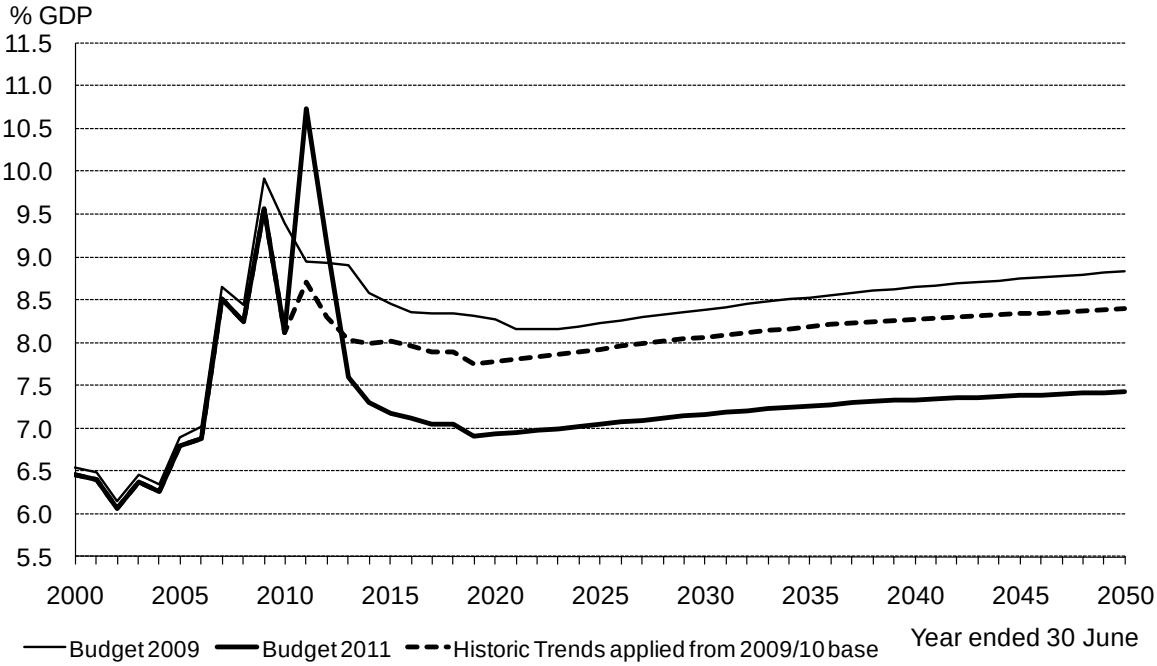


Figure 17 - Core Crown education expenditure to GDP



The graphs above and below 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 like justice, defence, core government services, economic/industrial services etc. Welfare expenses, including NZS, are largely excluded from the Operating Allowances because they are treated as demand-based spending. Debt-financing costs are also excluded, as they are a function of gross debt levels.

Figure 18 - Core Crown justice, transport, core government services, defence, etc expenditure to GDP



The graphs 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 2010. To show that these projections from the 2009/10 base are not unreasonable, especially in the case of the rising health one, the Budget 2009 projections are also included. For the other two classes, the ratios shown in historical years serve the same purpose.

The graphs make it clear that the reductions to expenditure baselines in the Budget 2011 are significant. Under the *Historic Trends* projection logic 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 past.

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

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

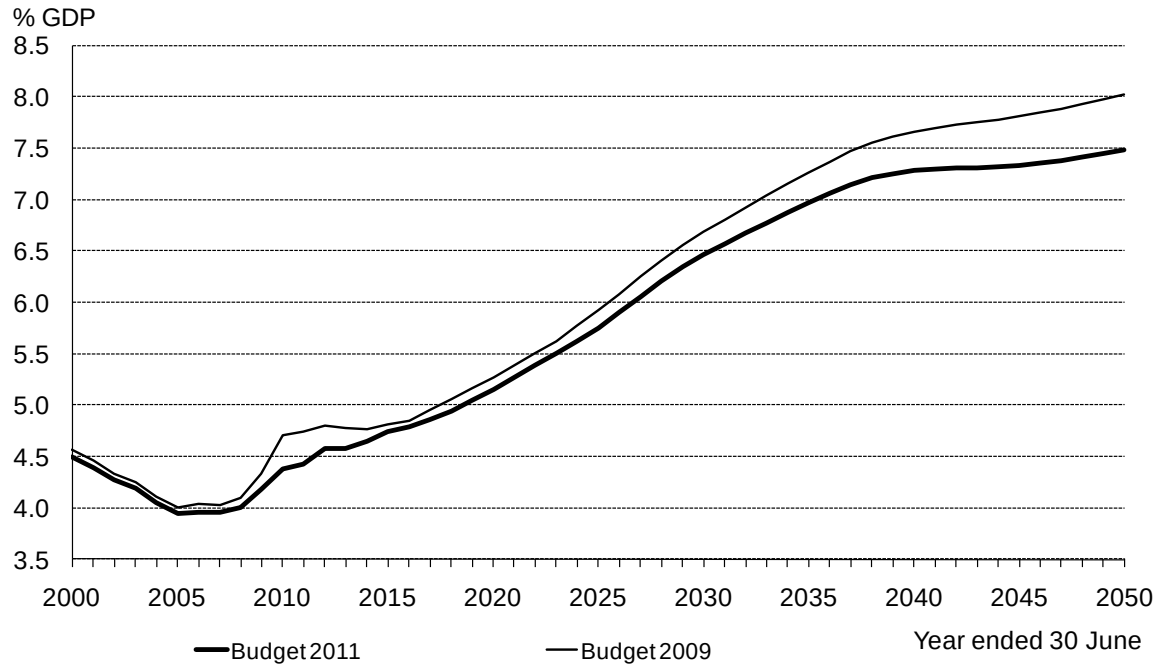
With a need for a more skilled workforce to lift NZ's productivity, will it be possible to reduce education spending, as a ratio of GDP, to less than it is now over the next 40 years? Admittedly the growth of the demographic driver behind education spending is reducing as our population ages. However, 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 projection logic suggests. Again, the obvious response will be for people to fund more of their education themselves, but the fairly positive response to things like interest-free student loans suggests that such a solution may not be popular with many people.

There are many calls for longer sentences on violent criminals and less leniency with repeat offenders. That doesn't fit very well with a reducing justice budget.

Many more examples could be made, but the point is hopefully 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 the following graph of NZS expenditure projections between Budget 2009 and Budget 2011.

Figure 19 – New Zealand Superannuation expense to GDP



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 couple with a small reduction in Statistics NZ's view of the growth rate of the "65 and over" age group over this period.

The equity question is fairly clear when you contrast this graph with the education one above. The reduced spending in education will fall largely on the young, or perhaps the middle-aged too as parents need to fund more and more of their children's studies. The elderly will, on the other hand, undergo no funding cut. Nominal levels of NZS actually increase from those in the Budget 2009 projections.

The current forecast base is not assured, but rather 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[3] at present), this forecast base may not ensue.

The key messages of the 2009 LTF Statement were:

- Make early policy changes, as they require smaller, more gradual adjustments.
- Control spending and focus on public sector productivity.
- Make economic growth a priority.

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 Kiwis.

[3] In post-war macroeconomic theory, inflation and recession were regarded as mutually exclusive. When the first instances of them occurring together were first encountered in the late 1960s and early 1970s, such as with the 1973 oil crisis, the British finance minister Iain Macleod coined a new portmanteau word to describe the situation, namely stagflation.

5.7 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 input, inflation etc, 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 2049/50, 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 has taken 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.

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 obvious way of tackling deficits, but this has potential negative implications for economic growth. It also makes NZ 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 so revenue or expenditure options need to be available in case higher growth is not achieved.

The aim of this paper is not to debate the pros and cons of various methods of addressing NZ's public debt. Having stated that there are options, 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 nominal 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 construed 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 have stated, in their 2011 Fiscal Strategy Report (FSR) that "…we will return net debt to a level no higher than 20% of GDP by the early 2020s."

As earlier graphs show, the *Historic Trends* technique produces a rising net debt track, even from the Budget 2011 forecast base. Consequently, to model a stable level of net debt to GDP via altered expenditure growth, an alternative method of projecting at least some of the expense classes is needed.

The expense projection method is the only difference applied, so as to isolate the effect of different expense paths on the net debt track. Treatment of all forms of revenue, gains, assets, non-debt liabilities and even social welfare expenditure, including NZS, is identical in all scenarios depicted.

The *Historic Trends* modelling projects from the forecast base using a bottom-up approach to growing expense classes like health, education, law & order, defence etc. This has been explained earlier in the paper, so will not be repeated here, except to state that this is a common methodology used in long-term projections.

An alternative approach is to impose constraints on the growth of the expense classes which are not treated as demand driven. This effectively mimics the Budget forecast approach of setting allowances for new operating spending, or Operating Allowances. The growth of most expense classes is assumed to come from taking a share of the Operating Allowances, the main exceptions being the majority of welfare spending and debt financing costs.

This is a top-down method, as for those expense classes whose growth is derived from the Operating Allowances, it effectively ignores their underlying drivers. In other words, growth of their recipient base, labour inputs, non-demographic demand factors etc, plays no role in determining their size in projected years. This method is also used in medium-term projections a decade beyond the forecast base, as depicted in the FSR.

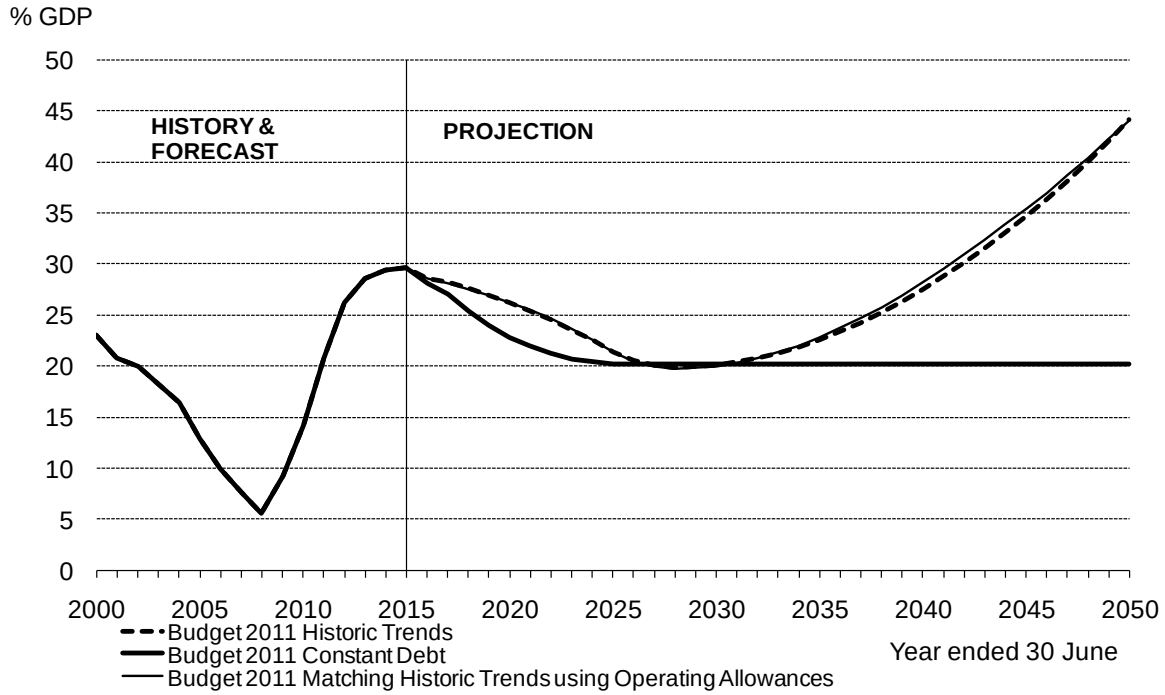
Top-down expenditure growth is not usually applied in long-term projections. This is mainly because, in a democracy like NZ, governments will come and go, meaning none could be expected to be able to impose their spending plans over such a long horizon. However, with that point accepted, there is no 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.

The next graph shows three net debt projections, with the heavy dashed line being the now familiar Budget 2011 *Historic Trends* track.

While hard to discern, there is a light full line depicting 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 & order, defence etc.

The heavy full *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.

Figure 20 – Net core Crown debt to GDP – alternative expenditure paths

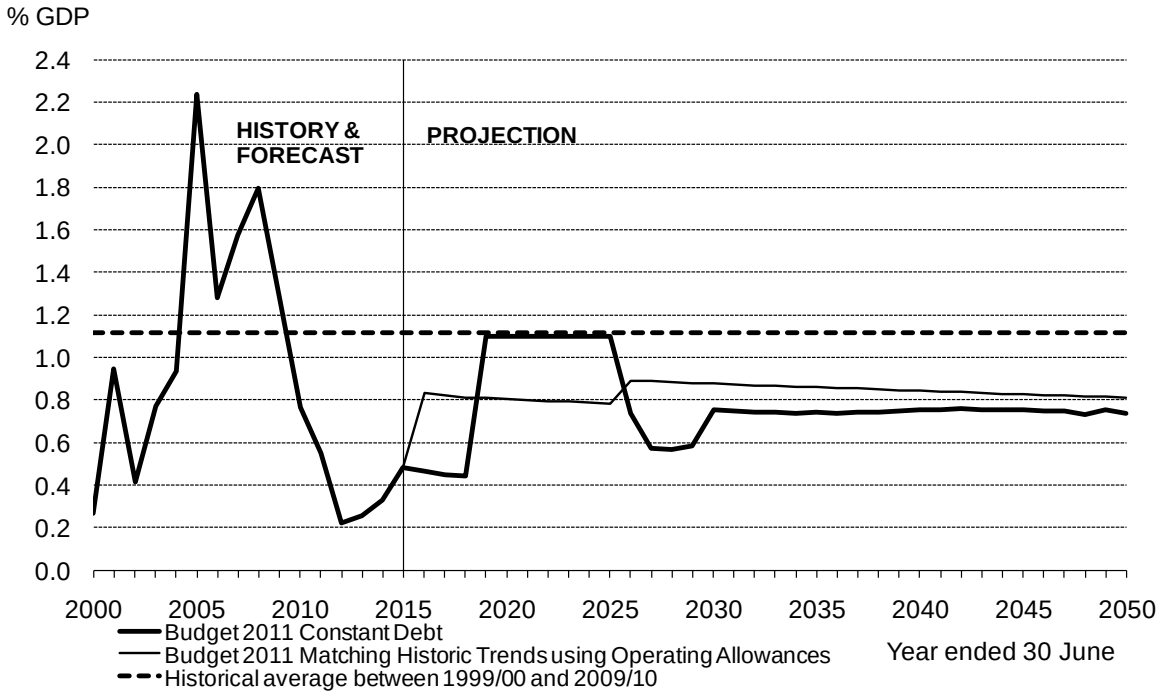


The interesting question is what changes are needed to the size of the projected Operating Allowances to alter the path of the net debt track from that which mimics *Historic Trends* to one of a stable, unchanging ratio to GDP i.e. the *Constant Debt* line?

The answer to that question is provided by the graph below, which also displays a few other notable features related to future expenditure growth.

From a similar level of net debt to GDP for both the *Historic Trends* and *Constant Debt* projections, around 20% a decade into projections (2026), the average size of future Operating Allowances is not as different as might have been expected. Across the 25 years remaining to 2049/50, the Operating Allowances that mimic *Historic Trends* growth average 0.85% of GDP per annum, while those that produce the *Constant Debt* track average 0.73% of GDP p.a.

Figure 21 – Core Crown operating allowances to GDP – alternative projections to produce different net debt paths



This again demonstrates the principle that was instrumental in producing the seemingly quite different net debt tracks from the three consecutive Budget forecast bases. Namely, that it 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 *Historic Trends* 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 stable level of 0.75% of GDP, in order to keep debt stable.

The *Historic Trends* 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 *Historic Trends* net debt profile.

The other very interesting point that arises from this graph 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 ten-year period is higher than even the long-term *Historic Trends* 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, i.e. the assumed tax settings, the assumed growth of demand-driven welfare spending etc, debt can only be stabilised by providing less of at least some of these goods and services from the public purse in future.

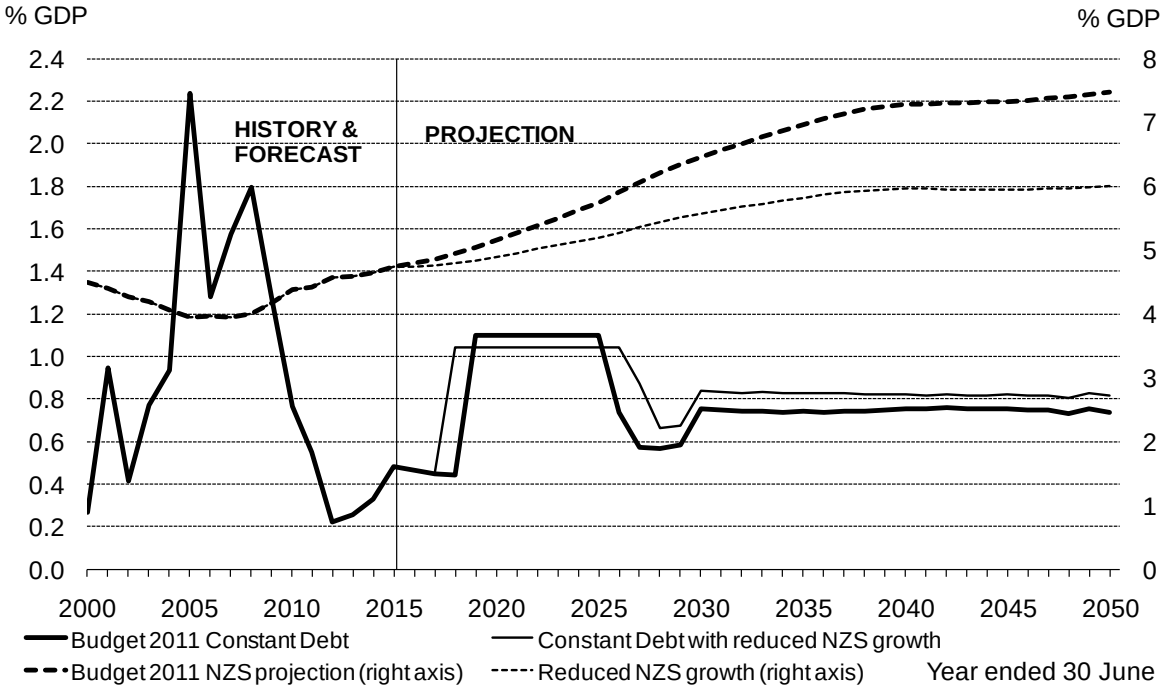
Future Operating Allowances at 0.74% of GDP represents only 2/3 of the previous ten year's average of 1.12%. At a time when an aging population is driving up demand in some areas of public spending, health being the main example, it will not be easy to achieve getting by on reduced Budgets. It is likely to require more stringency around funding conditions, such as means testing or time-limited access to some services.

This issue will be more thoroughly explored in the Treasury's next LTF Statement. However it is worth concluding this section with a "thought experiment" related to the cost pressures arising from an aging population.

The Budget 2011 projections have NZS expenditure rising from 4.4% of GDP in 2009/10 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 working age population.

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 reached 6% of GDP by 2050. The "some means" is not the concern of this section of the paper, although other sections do look at how some other Western economies are making changes to their public pension schemes in light of an aging population. Here we will simply assume some policy change or changes can be made to NZS parameters to achieve this.

Figure 22 – Core Crown operating allowances and NZS expenses to GDP – reduced NZS growth allows Historic Trends-like operating allowances and stable debt



The graph above 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 vertical axis);
- alternative Operating Allowance path that will stabilise net debt at the same level if NZS expenditure is reduced (light full line, left vertical axis);
- Budget 2011 NZS expense to GDP projection (heavy dashed line, corresponds to right vertical 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 vertical axis).

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.

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 *Historic Trends* averaged **0.85%** of GDP per annum over the same period.

Averaging the annual Operating Allowances over the entire projection beyond 20115 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 *Historic Trends*.

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 2/3 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 rapidly rise. 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 NZ’s means” would be more equitably shared.

6 What other countries are doing to address the effects of ageing

Ensuring the future fiscal position is sustainable will probably require a broad public acceptance about the appropriate role for government: What it can and cannot provide. Over the past half century, the state has changed the size and mix of services it provides

its citizens (and lifted the amount it raises as taxes). The situation today (or pre-GFC) is not what we had 20 or even 10 years ago.

Over the next few years, we have to decide collectively on a set of services the state provides us and w we provide for ourselves and under what circumstances. As pointed out above, the long-term net debt position is very sensitive to the success of short-term consolidation. If the consolidation is reversed or if the New Zealand economy suffers the effects of a further global or domestic shock, we may find the long-term fiscal position is closer to projections based on the 2009 or 2010 Budgets, rather than the more benign picture emerging from the 2011 Budget projection.

One of the high-level policy messages in both long-term fiscal statements has been that making a series of relatively small adjustments each year, starting early, can keep the ratio of net debt to GDP at a sustainable level. Two reasons for doing these projections are to provide warnings about trends and to provide time to announce and make policy adjustments for the longer term. The planned fiscal consolidation over the next few years is a good start to this process.

The two areas with the greatest pressures from the ageing population, NZS and public health, together make up about a third of non-debt-financing core spending by the government at present. In the Budget 2011 Historic Trends projection, discussed above, these two grow to just over half of all primary spending by 2050. In 2011, NZS is 4.4% of GDP and grows to 7.5% by 2050. The corresponding ratios for public health spending are 6.6% to 9% in 2050. Any plan to stop the growth of debt over the long term will require maintaining small surpluses and it is difficult to see how this could happen if the two biggest programmes continue expanding along their projected growth paths.

Over the past two decades, in the face of population ageing New Zealand has reformed its pension system, including raising the age of eligibility (from 60 to 65 between 1993 and 2001), introducing a partial save-as-you-go system (the New Zealand Superannuation Fund from 2001), and broadened the coverage of private retirement provision (from 2007, KiwiSaver in its three versions). The public service defined benefit pension, the Government Superannuation Fund, was closed to new members in 1992.

Those measures boosted the long-run affordability of public pensions. On the other hand, a form of income targeting for NZS recipients was dropped in the 1990s (the surcharge), the payment level was raised in 2008 from 65% of the net average wage for a couple to 66% and the minimum individual contribution to a KiwiSaver account was lowered from 4% to 2% of wages in 2009 (and subsequently reversed in Budget 2011).

NZS's goal of providing insurance against poverty in old age has been a success. Through the 2000s, only about 2% of those aged 65 and older had income below 50% of the median income and before housing costs (one of the relative poverty measures), although this may rise in the OECD numbers over the coming year or so. Contrast this with the relatively high poverty rate (same threshold) of 15% for families with children.

NZS is regarded by many international observers as a successful way of delivering a basic pension. It provides nearly everyone with a retirement income base, payments do not depend on previous work history, or income levels or asset holdings, nor do they depend on whether you continue in paid work. Perhaps as a consequence, participation in the labour market by people aged between 65 and 75 is relatively high by international standards. That gives some people a way of having an income to top up NZS.

While the current cost of NZS at 4.4% of GDP is low by international standards, it is projected to rise to around 7.5% by 2050. As we can't add to debt at the rate of 2-3% of GDP every year, without incurring a debt blowout, future governments will need to consider changes to the structure of NZS. This may involve changes to the age of eligibility, or the way payments grow, offset by extending working age benefits to older people.

Health spending, including disability support and long-term care, is directed to helping people at all stages of their lives. However, people generally use a large part of their lifelong medical care in the last few months of their lives and this often occurs at older ages. Unless we change how health is funded and delivered, an ageing population implies rises in the public costs of health, even though increasing population ageing does not become the dominant driver of the growth in health spending over the next 40 years. Although technological innovation can lead to a decline in the cost of a service, overall spending can rise if the use of the service increases.

We have many successes to point at in our public health system. An example is Pharmac for the buying of drugs using a budget constraint, bulk buying, reference pricing and using generics. However, overall health spending growth over the past 15 years of 7.6% each year has not seen a rise in the productivity of the health system as a complex service sector.

Across the world, public pensions and health are the largest spending areas of many countries. Already several countries have signalled changes to shift some of these programme costs from public funding to individual funding.

Talking about pension affordability in general, the OECD has said that future reforms are needed that are both fiscally and socially sustainable, noting that governments cannot risk a resurgence of old age poverty (OECD 2011). This is also tied into housing costs: in New Zealand, those who own their houses at 65 have a better chance of have a more comfortable life after 65 than those who are renting or still with large mortgage payments. About half of OECD countries are in the process of increasing pension ages or have legislated increases in the future.

As NZS and the health system are reformed (and the public costs are reduced), people may fill the income gap by staying at work at little longer, drawing on their lifelong savings, or using more health insurance coverage. Changes to government programmes may need to be accompanied by reforms to the labour market so that older workers do not face workforce discrimination, and workplaces become more flexible over working hours and conditions.

While the 2011-based long-term fiscal projections look to have improved the fiscal position from now onwards compared with the previous two budgets, the international situation and the domestic economy still have large risks of another crisis and send our fiscal position back on the path seen in 2006, 2009, and 2010. At the beginning of 2010, the Australian Government published the third *Intergenerational Report* (IGR, Government of Australia, 2010*).* The IGR said that the projected ratio of net debt to GDP was at 20% by 2050. Despite this low projected debt ratio, the report still said that Australia had a long-term fiscal problem. The reason was that the line at this stage was rising and would continue to grow in an unbounded manner.

Timing, assumptions, and structural issues explained the difference between the debt outcomes in 2050 of the two countries. Compared with the 2009 New Zealand report, the

Australian IGR was based on a more recent forecast than the New Zealand report, when both economies had recovered more from the effects of the GFC. In addition, the Australian forecast returned to surplus earlier, immigration was assumed to be a higher proportion of the population, the long-term tax-to-GDP ratio was higher, and long-term productivity growth assumption was slightly higher in the Australian report than in the New Zealand one. The IGR also assumed that much of the growth in health spending would be paid for by the States.

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 century. In particular, compared with the 2009 and 2010 Budget cases, the 2011 Budget-based 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 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 costs pressures and steadily lower the net debt ratio. For a time, the 2011 Budget projection is a prefunding scenario.

This illustrates the positive power of debt dynamics. Eventually, though, the pressures of ageing still produce a rising debt as a ratio to GDP; it has just moved out.

Shocks aside, we should not pretend that the long period of fiscal consolidation will be easy to achieve. The paper also 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 the year ended 30 June 2050, expenses excluding welfare and debt-financing costs, have dropped from nearly 25% of nominal GDP in the Budget 2009 projection to 21.5% in the current one.

If both the projected spending tracks of 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 not be acceptable for 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 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 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. The work in this paper also emphasises the benefits of maintaining surpluses to extend a sustainable fiscal potion 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 on 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.

These projections 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 protections for society's most vulnerable, and
- Ensuring our tax system can fund our needs without becoming a brake on economic growth.

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