

# FISCAL SUSTAINABILITY UNDER AN AGEING POPULATION STRUCTURE

A paper to the 2012 New Zealand Association of Economists' Conference  
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## 1) Introduction

In March 2013 the New Zealand (NZ) Treasury plans to publish its third Long Term Fiscal (LTF) Statement, following on from the inaugural [2006 LTF Statement](#) and its 2009 sequel [Challenges and Choices](#).

This paper is part of a large process, involving contributors both within and external to the Treasury, of which the ultimate goal is the third LTF Statement. It is an opportunity to update economists, a significant group in the debate on NZ's future economic and fiscal direction, on the current state of our fiscal projections and the main messages behind them.

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

1. Explanation of why the upcoming Statement plans to switch its focus from *Cost Pressures* to *Controlled Debt* fiscal modelling.

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

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

2. Discussion of the current state of projections of key fiscal variables, under both *Controlled Debt* and *Cost Pressures* modelling. These projections use the recent 2012 Budget Economic and Fiscal Update (EFU) forecasts as their base.
3. Portrayal and discussion of a theoretical "frozen age structure" NZ that will assist in pinpointing the areas in which our changing demographic age structure is causing pressures on demand for publicly-funded goods and services, plus potentially reducing economic growth and hence the tax revenue that arises from it.
4. Demonstration of the impact of removing two years from the end of the forecast base for expense projections. This helps to display the sensitivity of the projections to their base, and reinforces the message of early, gradual change.
5. Examination of the role tax could play in the future fiscal position. This includes information on NZ's tax-to-GDP ratio in recent decades; a discussion around the impacts that need to be taken into consideration in raising taxes; and a scenario that compares overall expenditure tracks, excluding debt-financing costs, under the *Controlled Debt* modelling technique and different long-term tax-to-GDP assumptions.

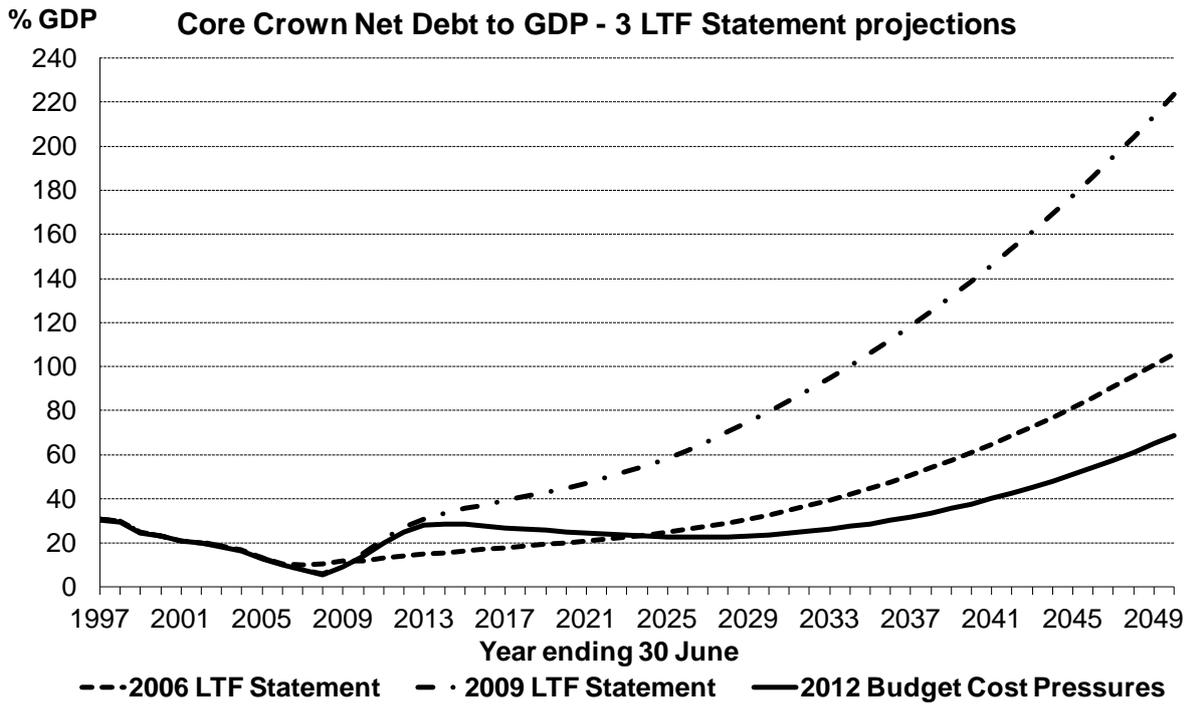
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<sup>1</sup> Economists often use the term GDP, or Gross Domestic Product, to mean Real GDP, a volume measure of economic activity in constant prices. However Nominal GDP, a current price measure, is used more frequently in LTF work. It is both a growth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

**2) Long Term Fiscal through a lens of constraining debt**

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

The graph below shows these bottom-up, “debt as residual” projections, as they appeared in the previous two LTF Statements and also from the recent 2012 Budget EFU forecast base.



A number of points arise from this graph, and many of them relate to the reasons for switching the focus of the next LTF Statement towards a *Controlled Debt* main scenario. The latter is not a new idea. It appeared in both the 2006 and 2009 Statements, in various guises. However, in those Statements it was viewed more as “one of the alternative scenarios”, with a *Cost Pressures* type projection being the main scenario.

Before discussing reasons for a change in focus it is worth clarifying that the 2013 LTF Statement will not discard bottom-up, *Cost Pressures* scenarios entirely. This type of scenario still has very important roles to play, especially in three main regards. These are:

- **Serving as a warning signal** that current expenditure and/or revenue settings will become unsustainable at some point in the future. While the level of debt to GDP reached by some arbitrary future year (in the graph above that is 2049/50) may differ markedly from projection to projection, all three curves displayed eventually bend upwards. The shape of the curve is the true message, as an upward-turning debt curve is a clear signal that changes to fiscal settings are needed to restore balance.
- **Illustrating some of the key messages** of LTF Statements, such as that **early, gradual change** is preferable to leaving things until quite drastic (and if the current

situation in Greece is anything to go by, probably unpalatable) reform is needed. A good deal of the improvement between the 2009 projection and the latest one is due to changes that have reduced the cost of some large-scale policies, such as KiwiSaver, as well as across-the-board reductions via “net zero” Budgets.

- **Acting as a counterfactual** to the *Controlled Debt* scenario. While it is difficult to quantify, with any degree of accuracy, the level of change needed in particular areas, it still helps to know where the main “pressure” areas are. For example, a *Cost Pressures* track can indicate that an ageing population structure will put greater demand in an area like Health than it will in Education. Hence finding ways to “bridge the gap” between the two scenarios is likely to put more emphasis for options in Health than in Education. It may also suggest that future Budgets will need to allocate new funding differently to how they have in the past.

Returning to the graph of the previous two LTF Statement Cost Pressures projections, and the current one, what are the main reasons for moving away from this approach?

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

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

To some degree, both of these “problems” arise from the *Cost Pressures* projections being exactly what they are labelled, namely **projections**, not forecasts. The two are sometimes mixed up, especially by the media, but they are quite different and should not be confused.

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

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

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

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

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

To a large degree the change in the 2049/50 Net Debt to GDP ratio in these projections is simply a product of the amount of time between the onset of ongoing deficits and the arbitrary projection end point of 2049/50. In the 2009 LTF Statement, produced at a time of huge uncertainty about the potential impacts of the GFC and without the same amount of fiscal consolidation that has been built into subsequent forecast bases, projected operating surpluses were never achieved. Debt-financing costs grew over both forecast and projected years, accounting for over a quarter of all core Crown spending by 2049/50 and making them the largest expense category by this time. By contrast the Budget 2012 EFU projection is in surplus by the end of the forecast years and does not slip into ongoing deficits until the early 2030s. Deficits have half the number of years to drive up debt relative to the 2009 projection.

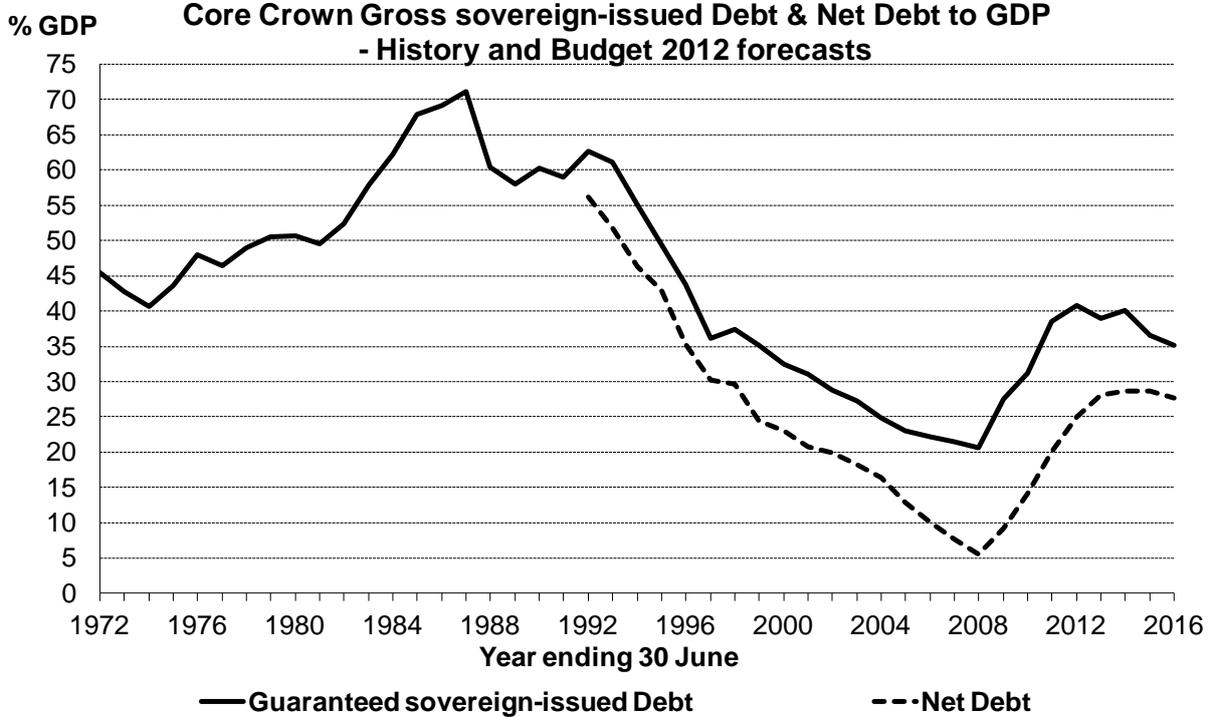
The accelerating nature of debt growth under ongoing deficits also adds to the seeming volatile nature of *Cost Pressures* projections too. Comparisons above quote an endpoint of 2049/50 simply because that was the endpoint in the 2006 and 2009 Statements. However legislation requires a 40-year horizon from the last actual or historic year, so the 2013 Statement will have to extend at least as far as 2051/52. While the exact endpoint is still undecided as yet, if we extend out to 2059/60 the *Cost Pressures* Net Debt to GDP track lifts over this extra decade from around 70% in 2049/50 to over 120%.

Finally, the potentially **sensational nature** of *Cost Pressures* projections can detract from the main messages intended to be conveyed. The national newspapers took the projections of the 2009 Statement far too literally and wrote articles about public debt reaching a trillion dollars. Apart from the questionable wisdom of quoting nominal dollar amounts 40 years into the future, this may have done some good if it shocked people into appreciating the need for policy change. But if it made them view the relative certainty of the changing age structure as an insurmountable problem, rather than something that we have time to adapt to and extract positive outcomes from, then the communication was the exact opposite to that intended.

If those are the main problems with *Cost Pressures* type projections, how will focusing on a different kind of projection, the *Controlled Debt* type, help? After all, it is still just a projection, and as such it cannot hope to accurately portray the future, although it will hopefully be more realistic than the spiralling-out-of-control debt projections of the *Cost Pressures* approach. There will be economic upturns and downturns, natural and political events that we cannot possibly foresee, technological change that is impossible to predict etc.

The strength of the *Controlled Debt* approach is that it can mitigate, if not totally alleviate, all of the major communication problems identified above with a *Cost Pressures* type projection.

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



Despite some measurement differences over time, the overall picture is evident. NZ’s fiscal history, especially over the last 25 years, has mainly been one of reducing the ratio of public debt to GDP. The advent of the GFC, plus the impacts of the Canterbury earthquakes, has caused debt levels to rise in recent years. However, adding the Budget 2012 forecast years to the graph shows a strong focus of current fiscal policy on reversing this lift too.

At this point the level of Net Debt to GDP targeted in the main *Controlled Debt* scenario has not been settled. The working assumption used in this paper is 20%. There is no preference or perception of optimality about a 20% Net Debt to nominal GDP ratio. In fact it is more the absence of a stated preference that has led to its use. This is simply a reflection of the current fiscal objective, as stated in the [2012 Fiscal Strategy Report](#), to ensure that “*Net Debt remains consistently below 35% of GDP, and is then brought back to a level no higher than 20% of GDP by 2020*”. It is also in line with the goals of the previous Labour-led coalition.

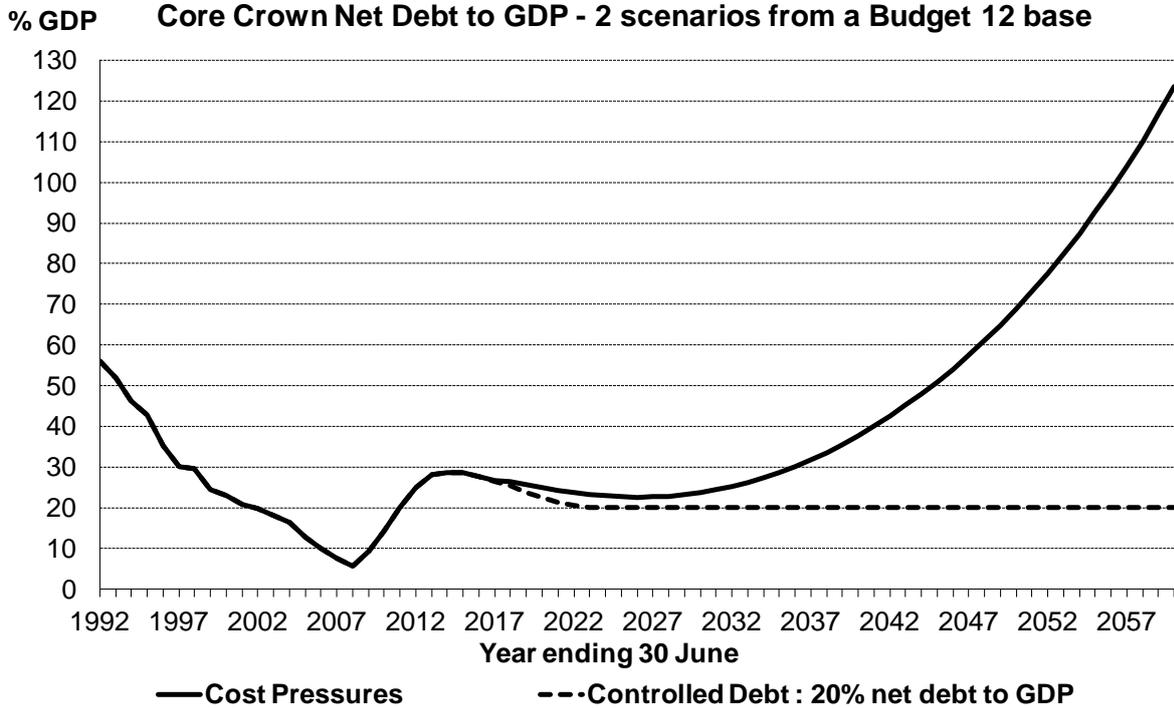
Furthermore, while the path to achieve a certain ratio of Net Debt to GDP is dependent on that ratio, maintaining it beyond that is more a function of the revenue and expenditure settings in those years. In a projection, where hard-to-predict real world impacts on debt like revaluations are not modelled,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

While politicians, media and the public can debate the best ways to achieve a relatively low and stable level of public debt in a future where the population’s age structure is quite different – in fact this is precisely what the LTF Statements are intended to achieve – they will not be able to dismiss the *Controlled Debt* projections as “unrealistic”. As the graph above illustrates, successive NZ governments from both sides of the political divide have

strived to achieve such outcomes in history, are doing so now (especially after the impacts of the GFC) and are very likely to continue to do so in the future.

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

Here are the current *Cost Pressures* and *Controlled Debt* core Crown Net Debt tracks.



A focus on the need to make decisions around expenditure and tax settings, in order to “live within our means”, will hopefully point the media more towards stories that promote debate around these future choices and trade-offs. At the very least, debt is a long way from “a trillion” under the *Controlled Debt* projection, so that headline is no longer available.

In summary, making a *Controlled Debt* projection the focus of the 2013 LTF Statement could:

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

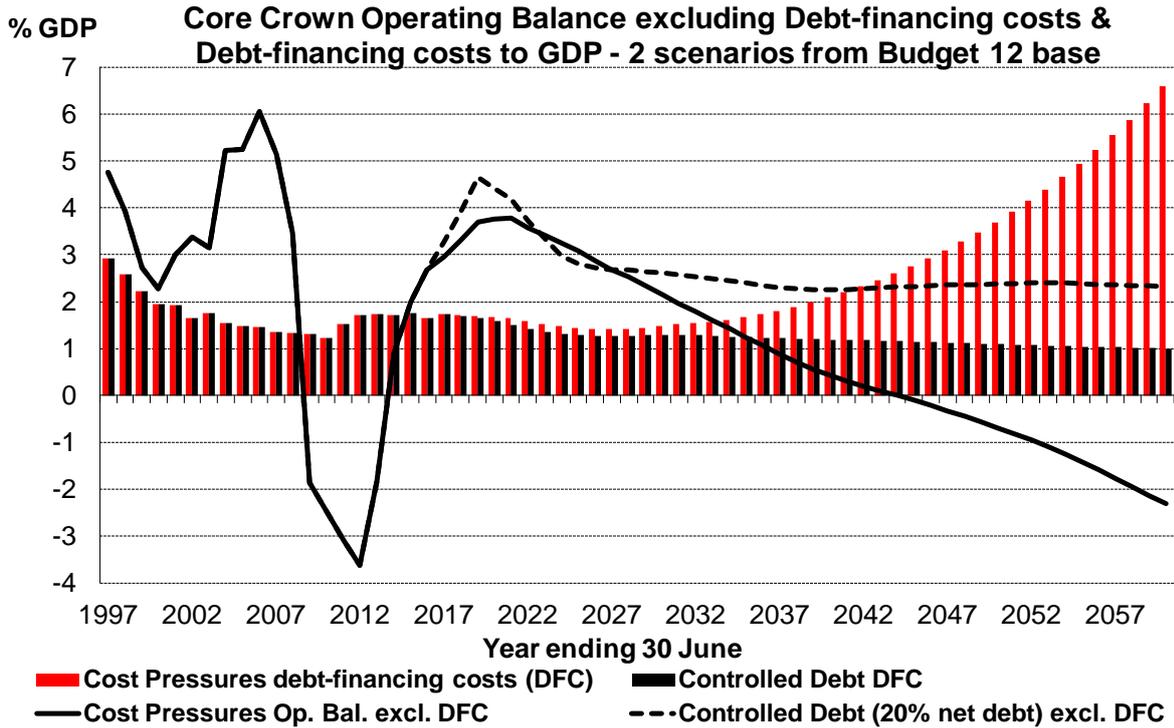
**3) The current projections**

Treasury is presenting another paper on the Long Term Fiscal theme at the 2012 NZ Association of Economists' Conference titled *Long-term Fiscal Projections: Reassessing assumptions, Testing new perspectives*. This paper gives detailed explanations of the bottom-up projection techniques applied to various expenditure categories, as well as how tax and other revenue types are projected in the LTF modelling.

The core Crown Net Debt to GDP projections, under both *Cost Pressures* and *Controlled Debt* scenarios, have already been illustrated. As has been discussed, they are largely a product of the tax and expenditure assumptions in the scenario, or more correctly the gap between aggregate revenue and aggregate expenses that these produce.

Under the International Financial Reporting Standards (IFRS) accountancy system used by the NZ Government in its fiscal reporting, the Operating Balance is defined as:  
 Revenue (excluding gains) – Expenses (excl. losses) + Unrealised Gains/(losses)

The graph below illustrates, for the *Cost Pressures* and *Controlled Debt* scenarios, the core Crown Operating Balance excluding debt-financing costs<sup>2</sup> (abbreviated as DFC henceforth), as well as the DFC themselves. The purpose of excluding the DFC is to illustrate the true gap that needs to be bridged between the two scenarios. The DFC are a product of the debt stock so, if debt is controlled via balancing all other expenses with revenue, they will not rapidly increase and accelerate the growth of the debt that generates them.



There is quite a lot of information in this graph, so it is worth outlining and explaining some of the main points that it illustrates.

Firstly, the projected dashed line, which represents the core Crown Operating Balance excluding DFC to GDP for the *Controlled Debt* scenario, is more aligned to history than the projected solid line, which represents the same measure for the *Cost Pressures* scenario.

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

Not surprisingly, given the relationship between the Operating Balance and debt, this is the same outcome that was purported earlier in regard to Net Debt. The only period in recent history where this surplus/deficit measure goes negative is after the onset of the GFC in the fiscal year 2008/09. Fiscal consolidation in order to address this is built into the Budget 2012 forecast base, meaning the Operating Balance excluding DFC returns to positive by 2013/14.

Secondly, and probably more importantly from the perspective of communicating the challenges and choices facing NZ over the next half century, the “gap to close” appears less daunting than when it is illustrated via debt. The solid *Cost Pressures* line, moving downward from the early 2020s onward, parts company with the *Controlled Debt* dashed line around the late 2020s. Over time the gap between them steadily grows, reaching around four and a half percentage points of GDP by 2059/60. Closing such a gap will not be an easy task e.g. it is bigger than the projected rise in the public pension, New Zealand Superannuation (NZS), over this period. However, it appears more “do-able” than closing the 100 percentage points of GDP gap depicted in the equivalent Net Debt graphs. This is especially true for readers of the LTF Statements whose knowledge, of how the projections are constructed, is limited.

Thirdly, and related to the last point, the graph also shows, via the red and black shaded histogram, the pathways of DFC under the two scenarios. Albert Einstein is claimed to have stated that compound interest is “*the most powerful force in the universe*”. If he did actually say that, the *Cost Pressures* debt projections would back up the great physicist. Under *Controlled Debt* the DFC to GDP decline over time, dropping to 1% by 2059/60. This is lower than the average of 1.8% between 1996/97 and 2010/11. While this could be viewed as optimistic, it is surely more plausible than the lift to 6.6% of GDP, by the same year, observed for the *Cost Pressures* scenario. The rapid increase in the DFC in this scenario also illustrates why Net Debt balloons under this projection technique. Once the DFC start to increase with the onset of operating deficits, they fuel a “debt-growth cycle”. By this it is meant that the DFC progressively add more to the annual amounts borrowed, in order for the government to stay solvent, which in turn generates higher DFC each year.

The remainder of this section will look at the current state of projections of individual expense and revenue classes. While it is tempting to do that for both scenarios, *Cost Pressures* and *Controlled Debt*, that would entail selecting a suite of policy choices in the latter case.

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

By its very nature, the *Controlled Debt* scenario represents a change. Its projection logic is governed by the annual funding amounts needed to stabilise Net Debt at a given percentage of GDP. As is clear by a comparison with the *Cost Pressures* Operating Balance excluding DFC track, these annual funding amounts do not equate to the underlying pressures. Clearly choices are needed in order to stay on the *Controlled Debt* Operating Balance track, but

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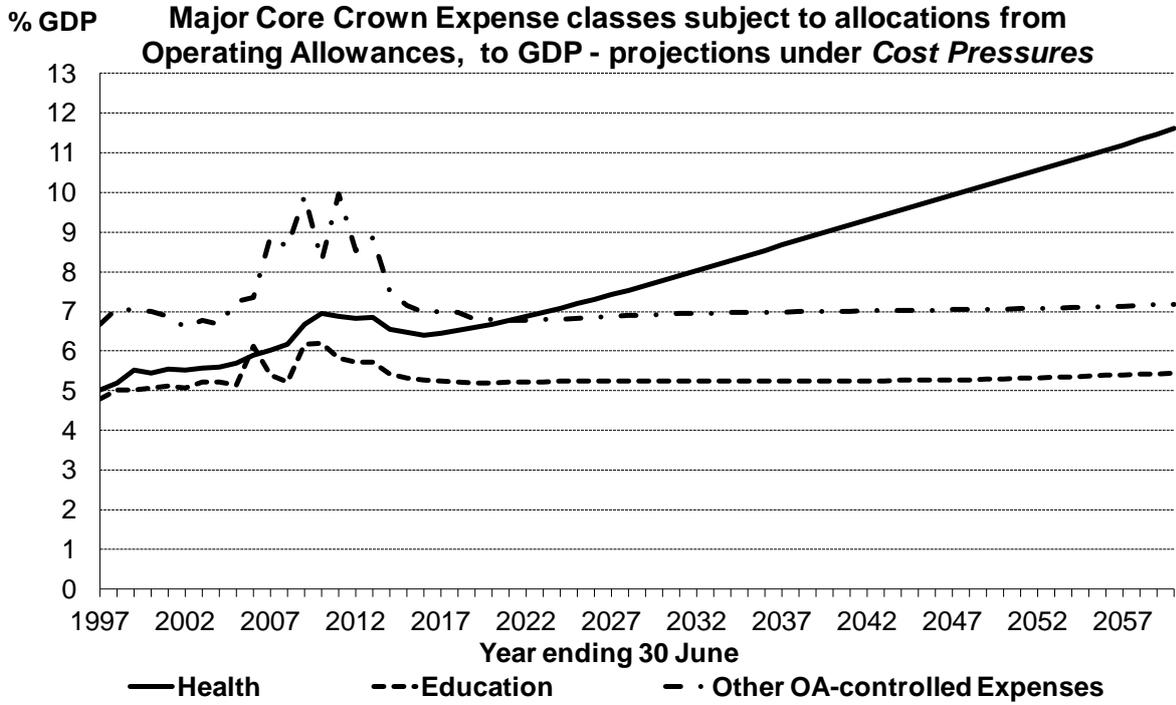
<sup>3</sup> This is not the best example to use here, as projecting source deductions (largely PAYE on salary, wages, benefits, superannuation contributions etc) tax revenue would, in theory, mean continuing to apply fiscal drag over the whole projection. In this case, practicality and history win out over the current policy rationale, and fiscal drag is only modelled for five years beyond the forecast base. If this were not the case, an adult Unemployment Beneficiary, who currently is taxed at the lowest rate on their benefit, would be facing the second highest personal tax rate by the mid-2050s. NZ’s tax history also shows fiscal drag is addressed periodically via personal tax cuts.

there are many ways in which that can be done. If, for example, the choice is to leave tax and NZS settings unchanged, that puts more pressure on spending areas like Health, Education, Law & Order etc. Alternatively it is possible to bridge the whole gap via tax increases, which would certainly lead to impacts on our economic growth, but cannot be ruled out as one of numerous potential options. There are changes that could be made to parameters of NZS that would lower its projected cost, easing the cuts needed in other spending areas and/or the lifts in tax required.

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

Rather it is the role of the LTF Statements to spell out the future challenges, explain their causes, and present an array of options available to address them. Individual sections of the next Statement, dedicated to a particular area, are likely to discuss what could be feasibly achieved in reducing costs or lifting revenue in that area. This would be accompanied by a discussion of how that could best be done while considering potentially competing aims such as fiscal savings, economic growth, equity and distributional issues, the environment etc.

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



The graph above depicts the current state of *Cost Pressures* projections for major spending categories that, in a normal Budget process, derive their growth from allocated shares of an annual amount set aside for new spending i.e. an Operating Allowance. Most functional

spending classes are included in this allocation process, with the major exceptions being social welfare transfers, including NZS, and debt-financing costs (DFC). The welfare spending is treated as demand-based, and hence is forecast in a bottom-up manner from year to year, rather than be subject to what is effectively a cap on spending growth. Likewise the DFC are purely a function of gross debt levels and are forecast as such.

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

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

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

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

- Demographically-induced demand for health services grows at a much quicker rate than the demographic driver of GDP, which is effectively labour force growth. Put more simply, while all age groups in society make use of publicly-funded health services, spending is skewed towards older people and the older age groups are growing considerably more quickly than the labour force is. As an example, in the year ended 30 June 2010 the “65 and above” age group comprised 13% of the population and received 34% of publicly-funded health spending. This age group averages 1.6% growth annually over the projection period, 2016/17 to 2059/60, while the annual average growth of the labour force over the same period is only 0.4%.
- The non-demographic volume factor that is built into the bottom-up projections is stronger for Health than for other spending areas. Our current estimate is 1.5% p.a. This growth driver is based on historical growth in the expense category beyond that which can be explained by the other drivers, namely demographic demand, inflation, labour input costs and productivity. In Health, where advancements in treatment from both technological change and medical research have improved the quality of life for

many people, it is perhaps unsurprising that this factor is higher than in other expense categories. Research shows that there is a positive correlation in most advanced economies between income growth and demand for health services

Education, despite being a major spending category not far from the levels of Health in recent history, does not undergo strong projected growth but rather stays fairly constant as a proportion of GDP. The reason for this is basically the opposite to one of the factors behind Health's increase, which is that the demographic growth driver for Education is weaker than that of the labour force in future years. While different for various educational areas, e.g. the demographic growth driving the tertiary sector is stronger than that for early childhood education, averaged out it equates to only about a third of the labour force's growth across projected years. That raises an obvious question of why doesn't overall Education expense behave oppositely to Health i.e. fall relative to GDP rather than level out? The answer lies in the fact that Education also has a non-demographic volume driver, and while not as strong as that applied to Health, it is still enough to largely counteract the "demographic dividend".

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

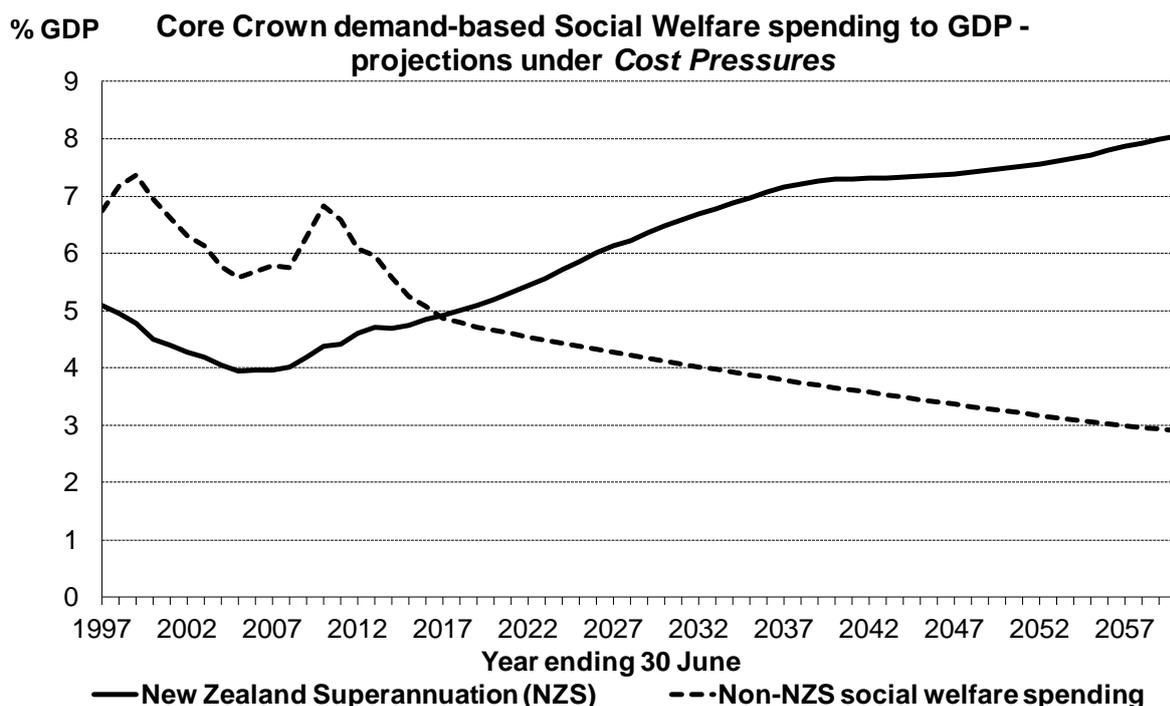
Following a similar track to Education, Other Operating Allowance-controlled expenses level out relative to GDP over the projection horizon. However the reasons this occurs are not the same. With the exception of Law & Order, where there is a small "demographic dividend" (ask any police officer and they will tell you crime is a young man's game), most of these spending classes are exceedingly difficult to ascribe to various demographic or gender groups. How does what the government spends on Defence or Heritage, Culture and Recreation differ in terms of its benefit to 70-year-old males, 30-year-old females or pre-schoolers? Possibly there are differences but defining them is extremely difficult. Hence most of these categories<sup>4</sup> simply have the growth of the adult population (15 and above) applied as their demographic driver. While this is stronger on average across the projection horizon (0.6% p.a.) than the labour force (0.4% p.a.), largely because labour force participation rates are lower among the "65 and above" age groups, the difference is not huge. The non-demographic volume factor built into these spending classes, while a little weaker than that of Education, is more than enough to offset this small difference.

The spikes in recent years are the result of a few different contributions from various areas. Core Government Services are impacted by the tax receivable write-downs and impairments. Beyond 2006/07 these are quite volatile in historical years, suggesting their lower and far more constant values in earlier years were a product of a different measurement technique. Like the Student Loans spikes in Education, these erratic valuation-based measurements cannot be projected into the future. Transport and Communications also lifted in 2006/07, due to NZTA spending increases, although this change was more of a permanent upwards shift rather than the product of valuation fluctuations. In the final historical year, 2010/11, and the first forecast year, 2011/12, there are temporary rises, related to the earthquakes in Canterbury, in a few categories covered by Other.

The demand-based nature of social welfare spending, including NZS, has already been outlined. The *Cost Pressures* scenario projections of these are shown in the graph below.

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



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

In regard to the decreasing ratio of NZS to GDP from 1996/97 to 2004/05, this was greatly influenced by a gradual lifting of the age of eligibility from 60 to its present setting of 65 between 1992 and 2001. Even when recipient numbers stopped declining after 2001, rates were above the “wage floor” used in annual indexation and hence only CPI-measured inflation indexation was applied. The first wage indexation did not actually occur until 2007.

Beyond 2007/08 both of these factors effectively reverse. The annual growth rate of the “65 and above” age group picks up (the current year, 2011/12, is the zenith at 4%) and exceeds general population growth over all future years of the projection. Wage indexation applied on both 1 April 2011 and 2012 and is expected to apply in all years of the Budget 2012 forecast base. As wage growth outstrips inflation in projections, this carries on in all projected years. Put simply, NZS projections have a similar per capita growth rate to GDP and a far stronger demographic driver, meaning they continually lift as a percentage of GDP over projections.

Explaining the path of Non-NZS social welfare spending is even simpler. The decline in most historical years is the combination of falling recipient numbers and CPI indexation (in the cases where any annual indexation is applied) to rates. It may surprise some to know that overall numbers on the main working-age benefits – Unemployment Benefit (UB), Domestic Purposes Benefit (DPB), Sickness Benefit and Invalid’s Benefit - declined in this period but it is true. In 1996/97 the monthly average for these combined benefits was 380,000. A decade later, in 2006/07, that had reduced to 280,000. The advent of the GFC in the second half of the calendar year 2008 pushed numbers up again, and these impacts are still seen across the Budget 2012 forecasts, although they do recede somewhat over these years.

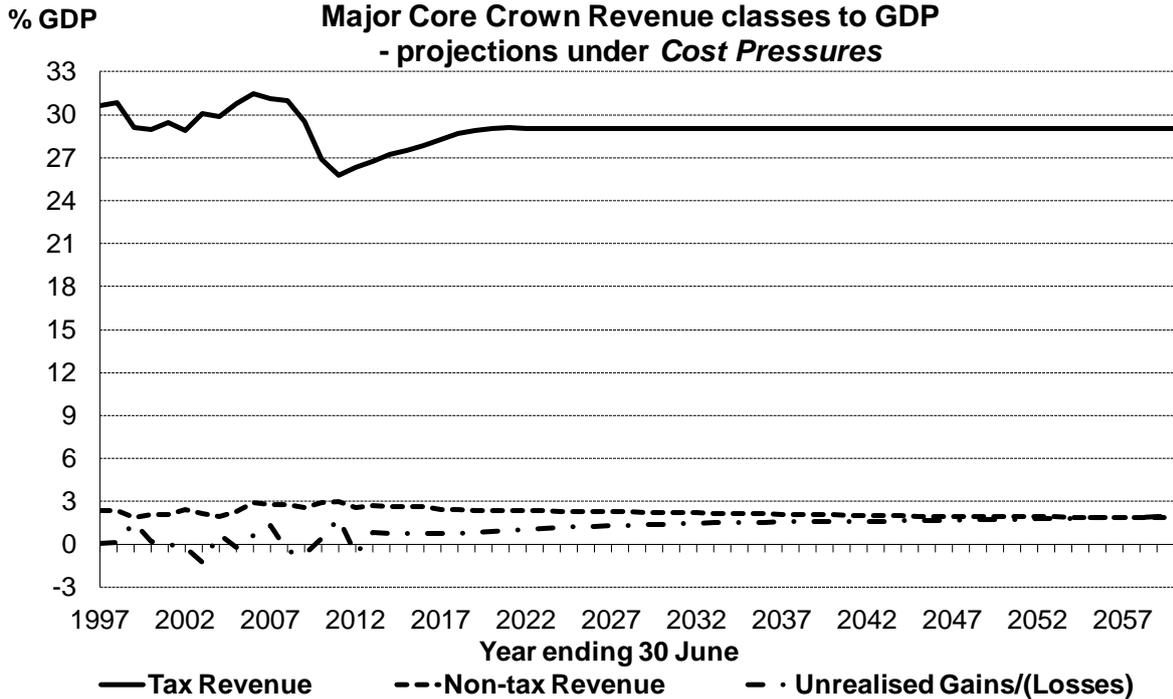
In the projections these benefit recipient numbers grow in line with their main demographic groups e.g. DPB numbers are heavily influenced by the growth of females between the ages of 20 and 45. UB is different in that it is aligned to the growth of the unemployed labour force which, after unemployment rates stabilise in projections, becomes labour force growth.

It isn't the demographic drivers that are the cause of drop in Non-NZS welfare spending to GDP over the projected years. It is true that they are not quite as strong as the labour force growth behind GDP, but the differences are almost insignificant. The driver of this decline is CPI indexation of the benefit rates over the entire projection. With per capita GDP growing in line with nominal wage growth, this projects a future where the incomes of beneficiaries do not keep up, in terms of growth, with those of workers and superannuitants.

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

The working-age welfare section of the next LTF Statement will likely run scenarios that do not just apply CPI indexation to working-age benefit rates over the projection horizon. Such scenarios, including the main one where inflation indexing of benefit rates is maintained over the projections, will be accompanied by a discussion of their impacts on the fiscal position and economic growth, as well as what they imply for equity and distributional considerations.

The final graph depicted in this section is that of the recent history, Budget 2012 forecasts and projections of core Crown revenue categories. This is dominated by tax revenue and the projection of tax is designed to reflect the current NZ regime.



As has been explained in an earlier footnote, a true projection of current policy would apply fiscal drag<sup>5</sup> to any tiered rate tax type, in particular source deductions, but practicality and history win out in this case. Fiscal drag is not modelled beyond five years into projections.

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

Given that it is incorporated in the five-year forecast base, fiscal drag is applied for at least a decade, which is an adequate approximation of the average length between major personal tax cuts in NZ since GST was introduced in 1986. Addressing fiscal drag effectively means ongoing changes to any tax type that is not flat rate (just the personal income taxes in NZ). While it is accepted that these adjustments would not really occur annually, that is a common modelling simplification in projections and makes little difference to overall outcomes.

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

Accepting those difficulties, the *Cost Pressures* projection logic brings the various tax types to a combined 29% of GDP about five years into projections and then holds them at that ratio in later years. Apart from modelling fiscal drag, much of the increase in early projected years reflects recovering tax types from the lingering negative impacts of the GFC. Corporate tax, in particular, is quite slow to return to “normal” levels as firms use up tax losses.

Non-tax revenue types are roughly evenly split between investment income, such as interest from financial assets, and non-investment income, such as fees, fines and levies charged by various departments. The latter are only projected at the growth of inflation. However this decline against GDP is largely countered by core Crown investment income growing more quickly than GDP. The reason for that is because it is dominated by the investment income of the NZS Fund, which has an expected long-run rate of return of 8.65%.

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

The non-tax revenue forms are helpful. However the graph indicates that they can only play a very limited role in any future mix of policy change that includes revenue increases to close the gap between the *Cost Pressures* and the *Constant Debt* Operating Balance tracks. Tax will need to be the focus of any options that involve higher revenue as part of their solution.

#### **4) “Frozen age structure” – a theoretical experiment**

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

With this degree of budgeting and planning, and given that the decade-long projections of the FSR have sufficed until recently, it raises the question of why does the Treasury publish LTF Statements? Putting aside questions around the validity of projecting over 40 to 50 years, a possibly more pertinent question is “Why is a longer-term focus necessary now?”

The answer lies in the one long-term projection for which there is the least doubt, namely demographics, or more specifically, NZ’s ageing population structure. It has already been explained in this paper that the economic and fiscal projections are not forecasts, but rather potential paths, based on a set of assumptions. It has also been stated that these projections cannot hope to accurately portray the future, with an almost limitless array of economic,

political, technological and societal change that cannot be predicted. While NZ's population over coming decades cannot be accurately pinpointed either, it is more predictable than fiscal or economic outturns. The reasons for that are that the trends in demography are more predictable, especially in regard to fertility, and that much of the population present in these projections, especially in the first 30 years, are alive now.

The Treasury paper referred to at the beginning of section 3, *Long-term Fiscal Projections: Reassessing assumptions, Testing new perspectives*, will examine the assumptions around the major contributors to demographic projections, namely fertility, mortality and net migration. Hence it is enough to state two basic trends here that mean that our population structure will continue to age across these projections.

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

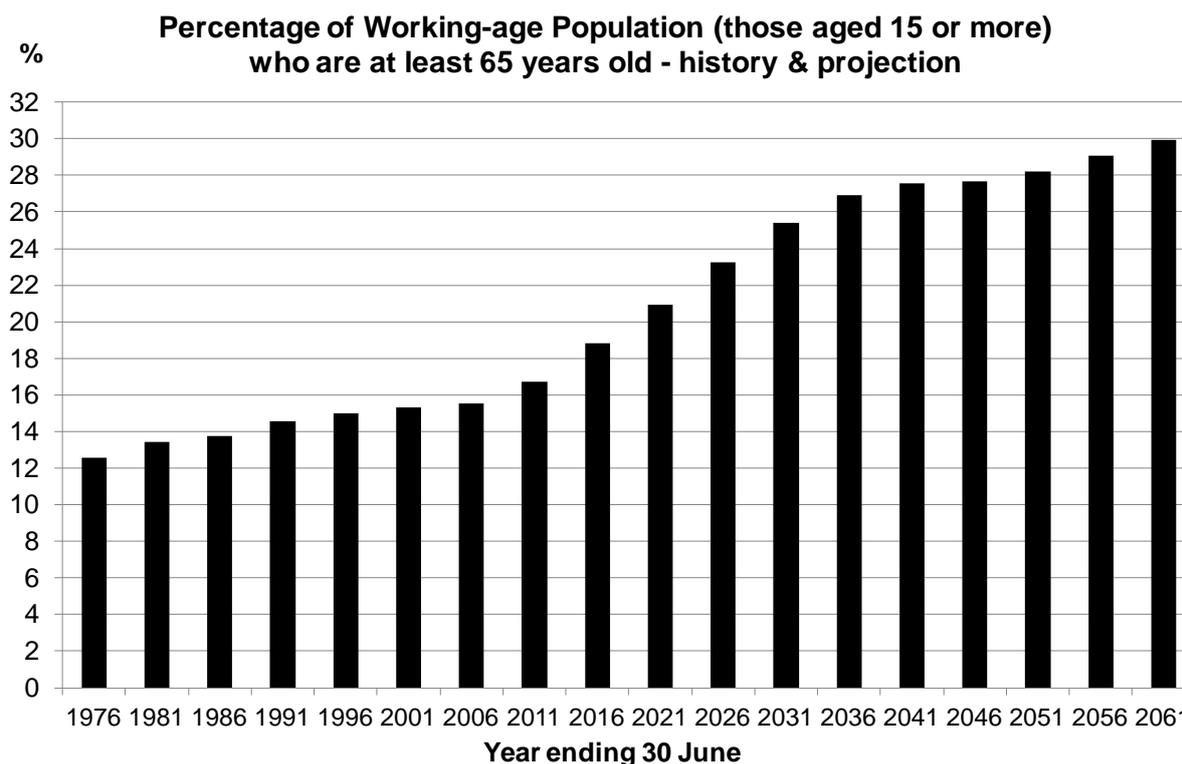
Mortality deals with the other end of the age scale. As is the case for many advanced economies, life expectancy has been increasing markedly for both men and women in NZ over much of the last century and especially over the last 50 years. As an example, the average life expectancy for males has increased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

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

The graph below illustrates the older age dependency ratio in NZ's recent, present and projected population. This is defined as the percentage of the Working-age Population<sup>6</sup> (WAP) aged 65 or above.

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<sup>6</sup> The WAP is sometimes defined as the age group "15 to 64", but in this paper it is intended to mean all individuals in the population aged 15 or more i.e. the potential labour force.



Dependency can be an emotive term. A couple in their seventies, living in and maintaining their own home, dealing with their own finances, managing their household budget etc probably do not consider themselves dependent on anyone. However, if they are receiving NZS, which is funded from taxation, then this part of their income is not of their own making.

Three points stand out from the graph, which are:

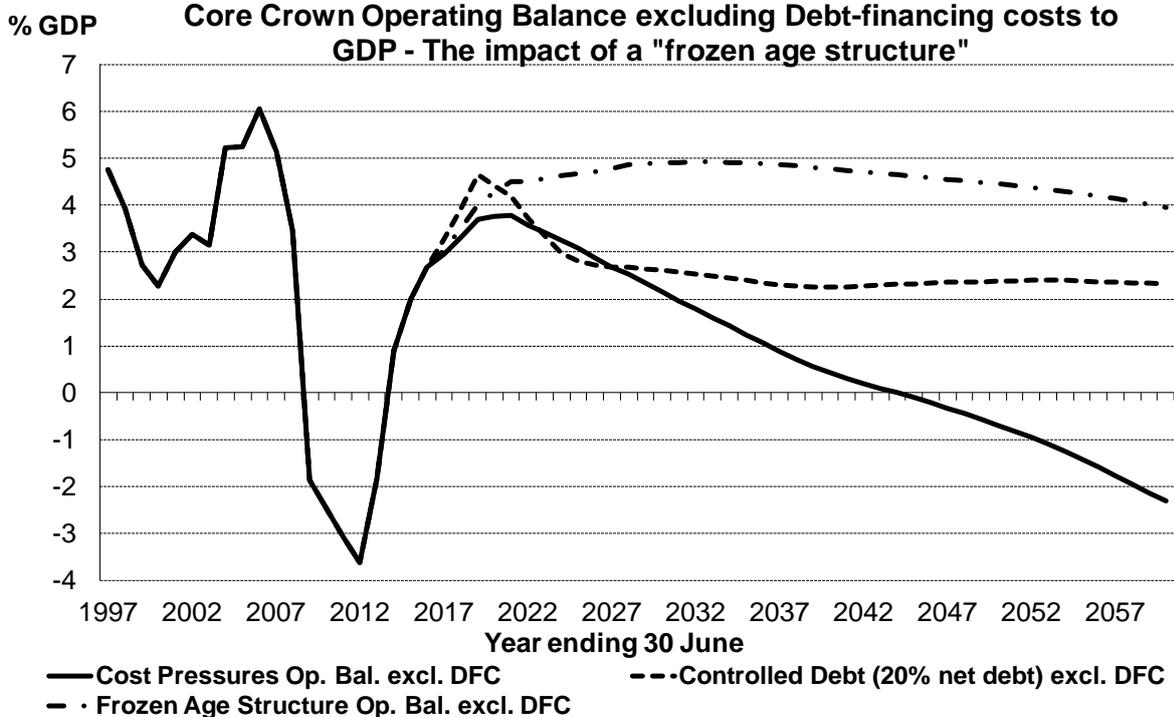
1. The dependency ratio is projected to rise from just over 12% in the mid-1970s, or one NZS recipient to every 7 younger potential workers, to 30% by 2060/61, or a ratio of only 1:2½ (or 2 to 5) of pensioners to younger adults.
2. From 1976 to 2006 the dependency ratio lifted quite slowly, but the increase over the next ten years to 2016 will surpass that over the previous 30 years. After that it accelerates again so that, by 2036, the average growth rate over this 20-year period is nearly twice that over the previous 40 years.
3. Beyond 2036 the dependency ratio grows fairly slowly again, but it does not decrease. This emphasises the permanent nature of NZ's population ageing

So far this section has outlined the reasons for a longer term focus in public fiscal planning, which is the permanent shift to an older age structure that NZ faces. Earlier parts of the paper have illustrated that the public pension, NZS, and Health are areas of public spending that will be particularly affected by this, via significant growth in their recipient groups. The final part of this section will “complete the circle” by conducting a theoretical experiment around a “frozen age structure”. This illustrates that, if NZ's age structure stayed as it is now, the fiscal pressures would be no more than the normal ones and policy settings around spending levels could actually be made more generous and/or tax rates reduced.

Population growth in this Frozen Age Structure scenario is identical to that for the normal projections but the age proportions do not change from their expected distribution in 2015/16,

the final year of the Budget 2012 forecast. As an example, the “5 to 12 years” age group is expected to comprise nearly 11% of the population in 2015/16, but that is projected to fall to just under 9% by 2059/60. Under the Frozen Age Structure scenario this age group stays at nearly 11% as the population grows.

The graph below depicts the core Crown Operating Balance excluding DFC track under the Frozen Age Structure scenario, and also the Cost Pressures and Controlled Debt scenarios.



Throughout the projected years the Operating Balance track stays at the kind of levels of GDP seen throughout most of the 2000s, before the GFC impacted on NZ’s economy. This was quite a prosperous period for the NZ economy, buoyed by strong commodity prices for our exports, and annual GDP growth averaging over 6%.

Three factors in particular lead to the marked contrast between the *Cost Pressures* and *Frozen Age Structure* Operating Balance excluding DFC projections. These are:

1. Without the growth of the “65 and above” age group greatly outstripping that of the labour force, NZS to GDP does not rise over the projections in the *Frozen Age Structure* scenario. In fact, it slightly declines. By contrast there is a lift of over 3 percentage points of GDP between 2015/16 and 2059/60 under *Cost Pressures*.
2. Health spending still rises relative to GDP under *Frozen Age Structure*, but the increase over the period 2015/16 to 2059/60 is only 2 percentage points of GDP rather than the 5 of the *Cost Pressures* scenario. A lift still occurs because, as has been outlined, all age groups are recipients of publicly-funded health services and population growth in total is no different under the *Frozen Age Structure* scenario. However, it was also explained earlier that Health spending is more heavily skewed towards older age groups. Hence, as with NZS, when their growth is no stronger than any other age groups, Health expenditure does not rise by nearly as much.
3. With proportionally more younger people in the population, whose labour force participation is generally higher than that of people aged 65 or more, labour force

growth itself is stronger. This flows though to higher GDP growth over the projected years. As tax revenue is projected at the same percentages of GDP under both the *Cost Pressures* and *Frozen Age Structure* scenarios, there is literally more tax dollars to offset expenses in the latter.

As the saying goes “there are no free lunches” and *Frozen Age Structure* does not lead to expenditure savings in all categories. Education and Law and Order, which demonstrate various degrees of a “demographic dividend” under *Cost Pressures*, both rise relative to GDP under *Frozen Age Structure*. That is because their younger recipient groups (if that is the right term for Law and Order) undergo stronger growth in this scenario. Other areas like Core Government Services, which largely grow in line with GDP, generate higher nominal expenditure levels under the stronger GDP growth of the *Frozen Age Structure* scenario. However these areas of increased costs are not enough to offset the gains in the Operating Balance track, relative to the *Cost Pressures* projection, described in the bullet points above.

With an Operating Balance projection like that of the *Frozen Age Structure* scenario, there would be no need for LTF Statements. It allows fiscal headroom to retire existing debt, increase public spending, add to assets, reduce taxes or a combination of these actions.

Unfortunately, a frozen age structure is a theoretical concept only. It is virtually impossible to conceive of any circumstances by which this could actually occur. The reality is that, as has been discussed, the ageing population structure that sits behind the *Cost Pressures* scenario is probably the most reliable feature of the long-term projections.

Given that, there is a need to plan for the permanent change in our population age structure that will evolve over the next few decades. This demographic phenomenon does not have to be a negative thing, the so-called “silver tsunami” that has become the catch phrase of newspapers in recent articles on the affordability of NZS. But politicians, policy makers, businesses, employers and the public need to start preparing for these changes in our future workforce and society now, so that they can be made advantageous rather than problematic.

And the LTF Statements can play an important role in educating all of these groups about these issues. That is the primary reason that the Treasury produces them.

## **5) Removing years of Operating Allowance-controlled spending from the base**

The introduction to this paper briefly outlined the major differences between the *Cost Pressures* and *Controlled Debt* scenarios. Section 3 discussed the bottom-up modelling of expense classes and tax revenue under *Cost Pressures* and noted that the Treasury paper *Long-term Fiscal Projections: Reassessing assumptions, Testing new perspectives* provides even more detail about this.

The reason this section starts with reference to these differences is because the forecast base of the Operating Allowance-controlled expense projections, be they under *Cost Pressures* or *Controlled Debt*, is effectively produced under *Controlled Debt* logic. In the [Forecast Statement of Financial Performance – Functional Expense Analysis](#) tables in Budget 2012 (or in any Economic and Fiscal Update), over the forecast years, most classes of spending are fairly flat. The major exceptions are Social security and welfare, DFC and Forecast new operating spending i.e. the Operating Allowances. This is not because there is an expectation of no growth in Health, Education, Law and Order, Defence etc spending. Rather it is because the new spending in these areas will not be treated as demand-based, as Welfare or the DFC are, but rather allocated from these Operating Allowances. The latter can, and have in past Budgets, been used to offset tax revenue reductions too.

Under *Controlled Debt* this “capped spending” approach extends out into projections, with annual amounts of new funding, effectively annual Operating Allowances, determined by what can be afforded while keeping Net Debt stable as a percentage of GDP. This is not how the *Cost Pressures* scenario projects these Operating Allowance-controlled expense classes. From the end of the forecast base it applies various growth drivers aligned to the individual expense types i.e. a bottom-up projection.

As has been depicted earlier in the paper, the core Crown Operating Balance excluding DFC tracks of the two scenarios quickly move apart and this is because the bottom-up drivers produce expense growth beyond that allowed for in the projected Operating Allowances.

In the past the LTF *Cost Pressures* type tracks (as has been indicated, they did not always bear this label but the modelling logic was the same) have been criticised for launching from a forecast base. The rationale of the critics was that the Operating Allowances are what is planned but haven’t actually occurred. If they are not adhered to and immediate spending pressures are funded, the actual base of the projections will be higher and this difference will be magnified over the projection horizon. The only reliable base for expense category projections is history, and the last known year values are from where they should launch.

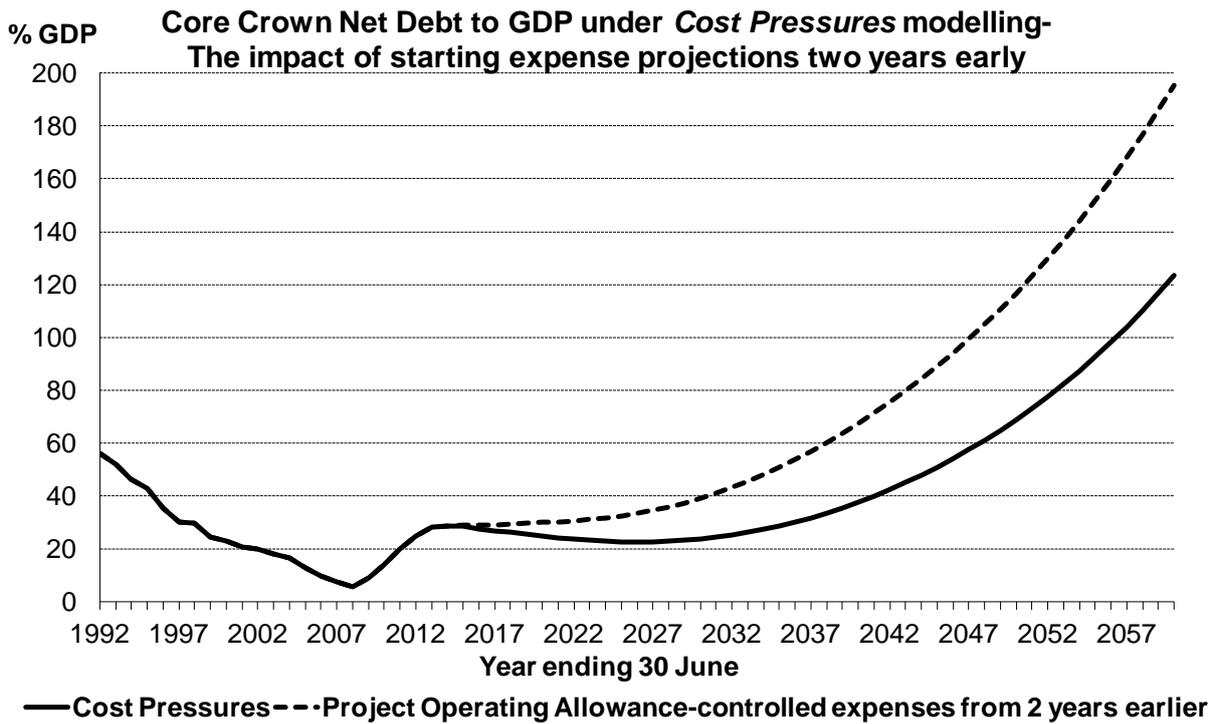
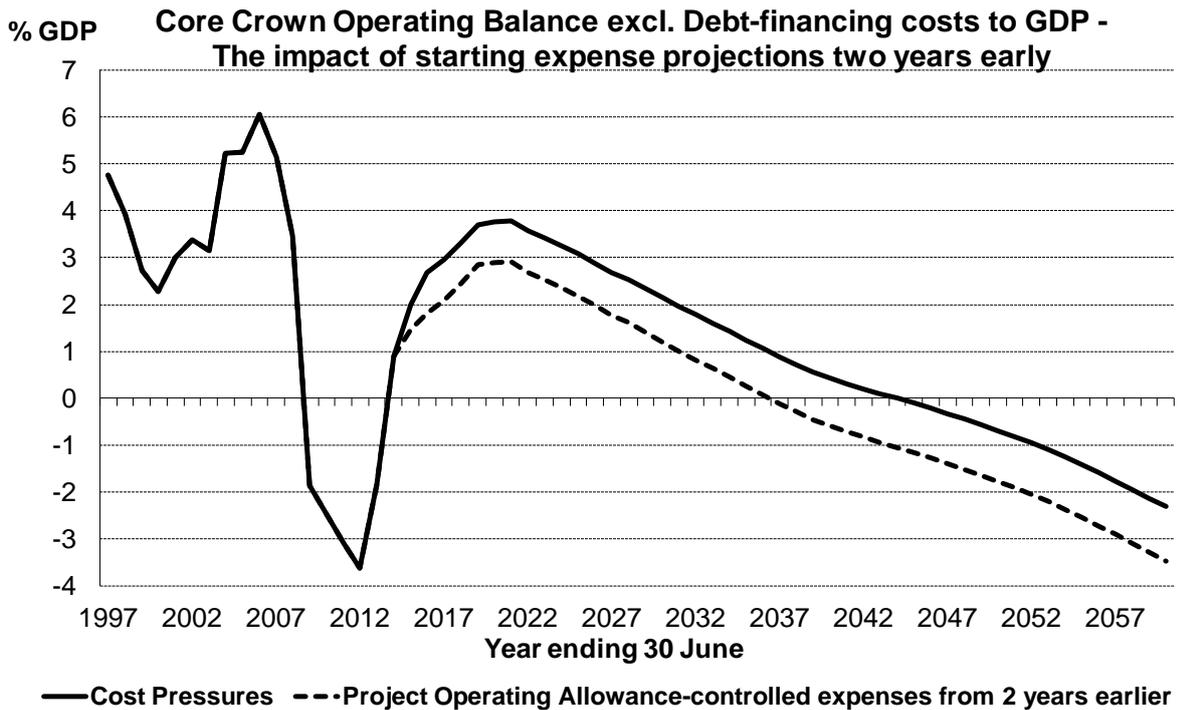
There is some validity in these criticisms. The Operating Allowances are forward-looking, planned expenditure growth, not reality. They have not always been adhered to and the use of “between Budgets” spending in the past has already been mentioned. It is not a common occurrence in NZ’s history to find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

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

The option that will be examined in this section is one that should hopefully go some way to appeasing these criticisms but also acknowledge that governments will endeavour to adhere to the spending plans that they themselves set. It uses the Operating Allowances to set expense bases for projections in the years of the forecast horizon for which the current administration will be responsible for the Budget. Expense projections begin in forecast years that occur after the next election, for which it is possible that a different administration will be making spending plans. As that would only remove a single year (2015/16) from the current Budget 2012 forecast, the scenario modelled will mimic the situation that will apply for the forecast base of the next LTF Statement and remove the last two years. The 2012 Half Year Economic and Fiscal Update (HYEFU), published in December 2012, will be the likely forecast base of the 2013 LTF Statement. That HYEFU forecast will extend to 2016/17, as the 2011/12 year still incorporated in the Budget 2012 forecast will be a known year by then.

The following graphs compare tracks using the *Cost Pressures* projection technique from the normal end-of-forecast base and from a base two years earlier (2013/14) for the Operating Allowance-controlled expense classes. Demand-based welfare expenses still use the full forecast base as forecasts of these expenses are likely to be more accurate than projections. Graphs of both core Crown Operating Balance excluding DFC and Net Debt are illustrated.

While DFC are not a component in the first graph, they do impact on the Net Debt tracks. Hence they have been adjusted for the impact on core Crown Gross Debt caused by starting expense projections two years earlier.



The same exercise can be run for the *Controlled Debt* scenario. It does not lead to very visually impressive differences, especially in the Net Debt graph which obviously still flattens out at 20% of GDP over the majority of the projected years. However what the modelling does show is that the pathway to restore Net Debt to this stable ratio of GDP requires more austerity in these years than under the end-of-forecast projection base scenario.

This result is hardly surprising. If expenses lift more quickly in the initial years, debt will also rise when the revenue projections remain the same. From a higher debt position it requires lower annual Operating Allowance amounts to bring Net Debt back to the desired percentage

of GDP over the same time period. This means there is less money available in these years to provide publicly-funded goods and services or alternatively provide tax cuts.

There are other things to be gained from this exercise too. It demonstrates two things about the projections of which readers of the LTF Statements should be cognisant.

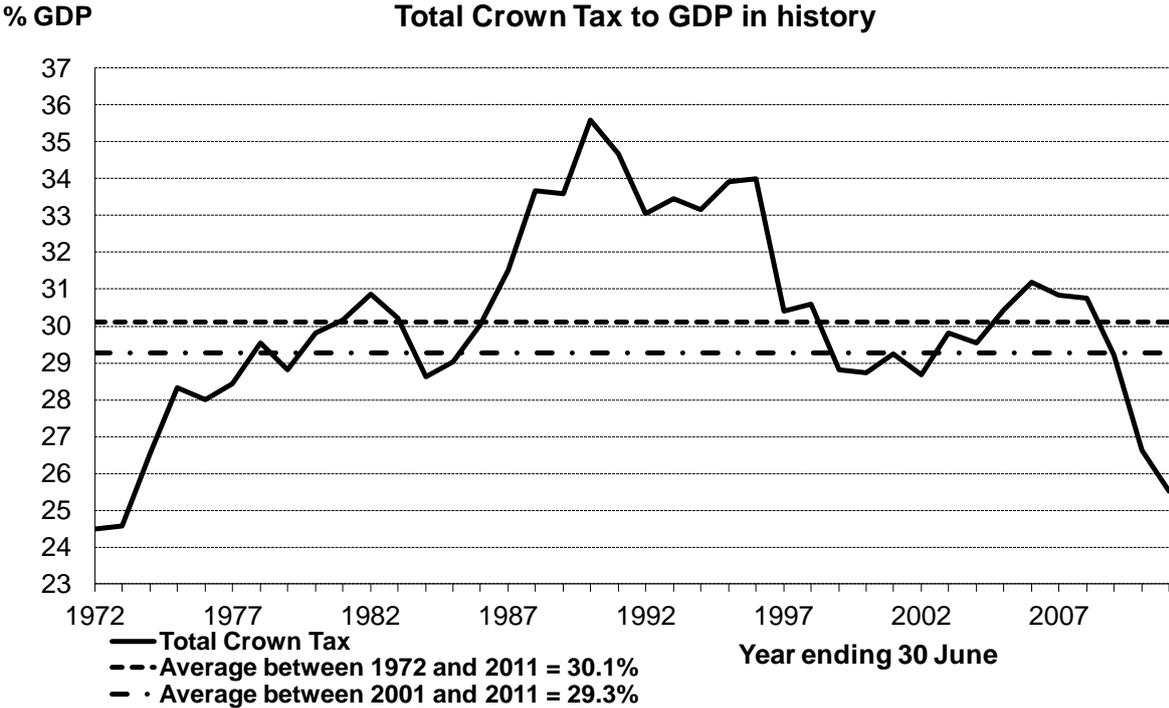
Firstly, that they are very sensitive to the forecast base from which they arise.

Secondly, and possibly more important as a LTF message, the fiscal consolidation built into the forecasts, via capping spending through the use of Operating Allowances, is good for the long-term fiscal position. This is in line with one of the guiding principles published with the last Statement, which was “Make early change”. Reducing spending gradually, before changes to the population structure really start to impact, will reduce the need for more drastic adjustments at a later time and give people more time to adjust.

**6) Tax revenue and the role it can play in LTF projections**

Section 3 discussed the projection of tax revenue under the *Cost Pressures* scenario. In particular it noted that the various tax types are brought to a combined 29% of GDP about five years into projections and then held at that ratio in later projected years. In other words, once the various tax types have been brought to their estimated long-term, stable ratio to GDP, they simply grow in line with GDP. The 29% figure reflects Treasury’s attempt to model the current NZ tax regime, albeit free of fiscal drag, in the growing-on-trend, cycle-free world of the long-term projections.

The following graph depicts the history of the NZ tax to GDP ratio over the last 40 years. Unfortunately it is Total Crown tax revenue, rather than core Crown, as data sources for the latter have not been backdated beyond 1993/94. It also consists of a mix between cash measures prior to 1993/94 and accrual revenue measures beyond that. Neither are major problems. Core Crown tax revenue is not significantly greater than the Total Crown measure –between 2006/07 and 2010/11 the average wedge was only 0.8% higher. While cash and revenue measures can differ markedly between months, this is normally due to timing issues around recognition and receipt of the tax liability and fiscal year totals are generally close.



It is clear from this graph that the tax-to-GDP ratio for NZ has differed quite markedly over the last 40 years, being as low as under 25% and as high as nearly 36%. The 2010/11 ratio of 25.5% is low, but this is hugely affected by the lingering negative impacts of the GFC on various tax bases, especially corporate tax and PAYE.

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

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

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

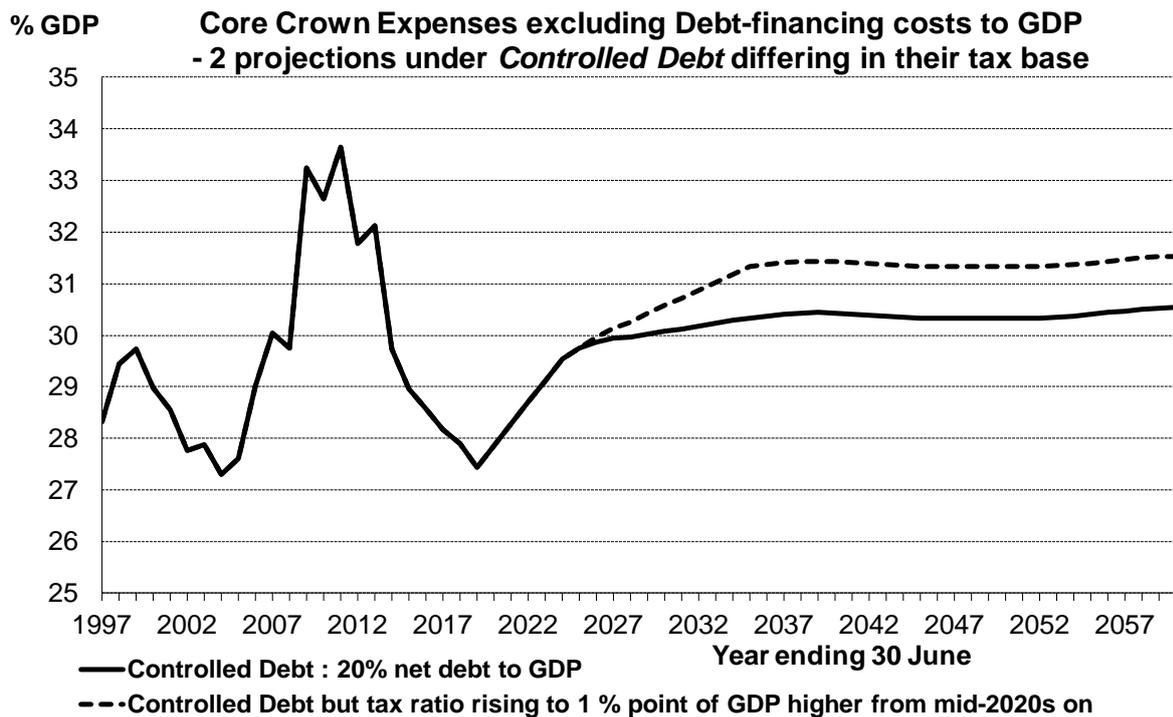
Any raise in any tax type is likely to have some detrimental impact on economic growth. Taxes mean an individual or business does not receive the full return to their labour, production or investment. Consequently they provide a disincentive to the individual to work more; to the business to increase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

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

The tax section of the 2013 LTF Statement will discuss the impacts of raising various tax types, taking into account factors such as the impacts on growth, the international mobility of their bases, equity issues, and the desire for NZ to retain a broad-based, low-rate tax regime. Any scenarios that are run involving tax increases will endeavour to estimate the impact on GDP growth involved, even if it is only short term, and flow that through the modelling.

To finish this section, a simple demonstration is illustrated of how the restraints on spending, necessary to achieve the Net Debt track of the *Controlled Debt* scenario, can be relaxed via a relatively moderate future increase in the tax-to-GDP ratio. The term simple demonstration is used for two reasons, which are:

- Despite explaining above that any increase in taxes should include some degree of negative impact on GDP growth, that has not been modelled in the scenario. This is mainly because the nature of the tax types increased has not been specified in this scenario. As has also been explained, the type of tax increased does matter in regard to the effect on growth.
- As *Controlled Debt* modelling uses as its residual a pool of annual new funding, which could be used to increase spending or decrease taxes, it is fairly predictable that the increases in the tax-to-GDP ratio modelled are simply reflected in the decreases in the ratio to GDP of expenses excluding DFC. This symmetrical relationship would not hold exactly if negative impacts on GDP growth were built into the scenario.



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