A way forward for NZ Superannuation

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1 Abstract

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NZ Superannuation is run as a Pay-As-You-Go (PAYG) scheme. In actuarial terms, the accrual cost does not equal the cashflows. Equality (or close to) of accrual and cost is the underlying assumption behind the accounting treatment of PAYG schemes.

The result of this is for observers to associate cashflows with the true cost (actuarial accrual), a distortion that misrepresents the true cost both during the accrual of boomers pensions (artificial surpluses) and during payment (artificial deficits). This results in widely swinging accounts (surplus/deficit) which is not representative of the true situation.

As a consequence various "solutions" are proposed that either transfer wealth between generations or overly penalise a generation (low accrual, low benefit). The problem is further exacerbated by the fact that people are living longer which results in the true cost being higher. Many people associate part of the accrual/cashflow problem with the increasing cost due to increasing lifespans.

In this paper I look at using a lifetime costing model (similar to a normal Defined Benefit pension scheme) to ameliorate these issues. I consider whether Super should remain unfunded or (partially or fully) funded.

There are issues should the scheme be regarded as "funded" (even if at 0% funding level!) mainly based around mismatching between assets (if any) and the liabilities. These would create huge surpluses and deficits that are not reflective of reality. This would make managing the countries finances problematical at best (or cause the liability to be ignored).

Therefore my main premise is that NZ Superannuation remains as a PAYG scheme. Based on this assumption, I then investigate and discuss potential methods of arriving at "fair treatment" for each generation. This results in a number of ways of implementing NZ Superannuation in practice.

Finally I offer some thoughts on how an automatic system might be implemented (thus reducing the effect that politicians will play in the future management of the scheme).

2 NZ Superannuation

2.1 Why This Paper?

2.1.1 Like most (all?) actuaries I am not an accountant. However, I have needed to understand quite a bit about accounting in order to meet my professional obligations. This has included work relating to employee entitlements (essentially unfunded pension schemes) as well as the Government Superannuation Fund (GSF). Both these areas gave me an insight into how and when expenses are recognised in the balance sheet (and, in particular, in the Crown Accounts).

2.1.2 What struck me was the difference in the accounting treatment in these cases and for NZ Superannuation. Bringing NZ Superannuation into line with this seemed to be both sensible as well as being in alignment with the financial approach adopted by the current Government in other policy areas.

2.1.3 When starting this paper, I intended to introduce a lifetime costing model. This was going to be in the form of having a stable PAYG population and a residual variance population. The former would remain PAYG and the latter would be funded (or at least the liabilities would be recognised within the Crown Accounts).

2.1.4 It did not seem practical to include the full liability in the accounts. There were a number of reasons why this would not work well. If there was any funding then there was likely to be large gains and losses each year (matching would be impossible given the dearth of suitable bonds in NZ).

2.1.5 Also, changes in benefits (e.g., changes in age of eligibility) would have a one off effect on the actuarial balance. This might have an undue influence on Government policy.

2.1.6 Finally, any liability on the balance sheet, *regardless of any explanations attached to it*, is very likely to influence rating agencies and foreign investors. This could have a seriously detrimental effect on the Crown's financing activities.

2.1.7 It is generally noted that moving from PAYG to funded will charge existing workers twice. In some ways this is a little misleading as there is no change in any benefits promised. All it does is to recognise the liability (and place it on the balance sheet). However, requiring the debt level to be a certain percentage will require additional funding (since an additional liability is recognised) and thus, unless the debt target is suitably moved, will end up charging existing workers twice.

2.1.8 At this point I produced some very clever and elegant equations (you'll have to trust me on this point) to calculate the PAYG population at each census. However, calculating this, based on having a minimal residual variation, as well as transitional rules (following each census) was more than a bit complicated.

2.1.9 Having seen the reaction of vested interests (e.g., coal miners) to climate change, it became apparent that this approach would not be practical. This resulted in more emphasis being put on explaining the effects of variations.

2.1.10 I have put forward a solution that will allow for a lifetime style costing (or, in other words, one that has minimal inter-generational transfers). This is quite generic as any solution needs public buy-in.

2.2 The Paper

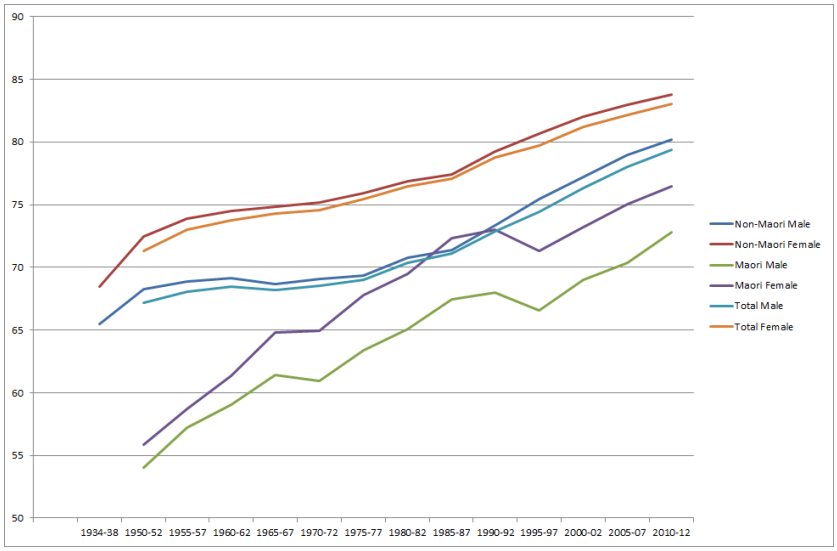
2.2.1 In the rest of the paper, I briefly cover NZ experience (section 3), the Accounting framework (section 4), introduce a simple explanatory model (section 5), some other options adopted elsewhere (section 6), comments

on alternative retirement ages (section 7), and finish with some options for long terms sustainability (section 8) and what we can and perhaps should do (section 9).

3 NZ Experience

3.1 Improving Mortality

3.1.1 Life expectancy from birth has steadily increased over time as seen below (these are the NZ Life Tables from Statistics NZ based on each census). There is a clear change in the rates of improvement from around 1985-87.

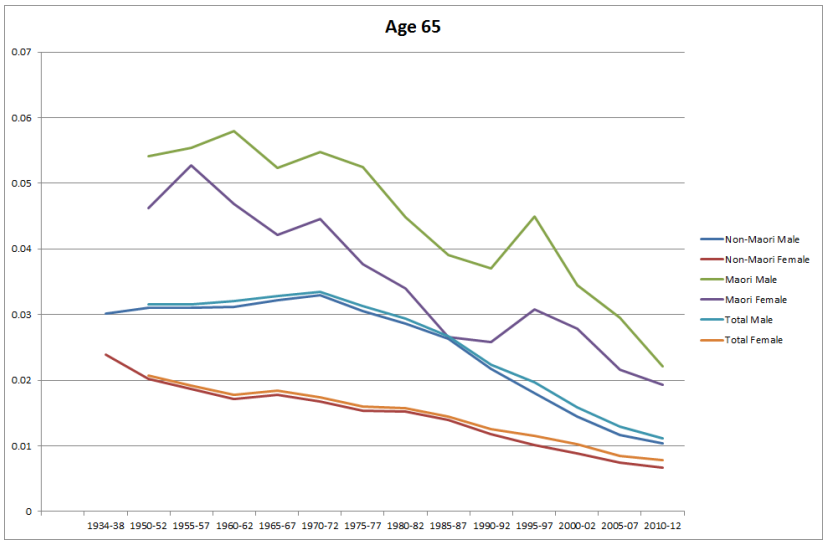


3.1.2 Much of the initial gains (in earlier years) was due to infant mortality. The improvement for age 0 and age 65 (q-rates only) over time are shown in the table below.

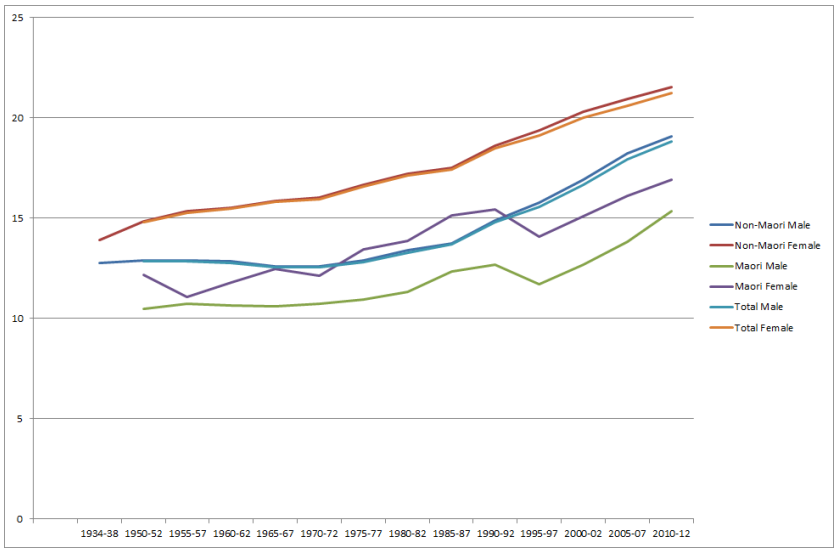
	Age 0		Age 65	
Years	**Male**	**Female**	**Male**	**Female**
1934-38	0.03653	0.02870	0.03017	0.02394
1950-52	0.02499	0.01995	0.03101	0.02021
1955-57	0.02267	0.01728	0.03099	0.01861
1960-62	0.02149	0.01626	0.03122	0.01717
1965-67	0.01928	0.01411	0.03224	0.01784
1970-72	0.01694	0.01304	0.03290	0.01679
1975-77	0.01649	0.01199	0.03053	0.01534
1980-82	0.01252	0.00987	0.02856	0.01518

1985-87	0.01115	0.00910	0.02637	0.01396
1990-92	0.00759	0.00584	0.02176	0.01183
1995-97	0.00589	0.00502	0.01801	0.01012
2000-02	0.00518	0.00438	0.01442	0.00884
2005-07	0.00486	0.00367	0.01164	0.00748
2010-12	0.00438	0.00358	0.01039	0.00674
Percent 2010-12				
1934-38	834%	802%	290%	355%
1950-52	571%	557%	298%	300%
1955-57	518%	483%	298%	276%
1960-62	491%	454%	300%	255%
1965-67	440%	394%	310%	265%
1970-72	387%	364%	317%	249%
1975-77	376%	335%	294%	228%
1980-82	286%	276%	275%	225%
1985-87	255%	254%	254%	207%
1990-92	173%	163%	209%	176%
1995-97	134%	140%	173%	150%
2000-02	118%	122%	139%	131%
2005-07	111%	103%	112%	111%
2010-12	100%	100%	100%	100%

3.1.3 This also indicates that the rise in the cost of NZ Super has only become significant in the past 30 years. The improvements in q-rates for over 65s are shown below.



3.1.4 The rise in life expectancy from age 65 was not as marked in terms of years compared to at birth (although higher in percentage terms):



3.1.5 A sharp change in the mortality rates for Maori (as shown above) coincides with the commencement of MMP. This **might be partially due** to a change in the mix of "Maori" as this is determined by the electoral roll over time. Also, any changes in the difference between Maori and Non-Maori with regard to smoking percent and socio-economic status will explain some or all of the relative changes. This, clearly, is an area for further study.

3.1.6 There is a change in the ***rate*** of overall improvement over time. The average annual improvement for the q-rates for ages 65 to 85 between each census is shown in the table below. There is a distinct difference between the period to the 1980-82 census and the subsequent period.

Census Years	**Male**	**Female**
1955-57	0.0%	1.3%
1960-62	-0.2%	0.5%
1965-67	-0.7%	1.0%
1970-72	0.0%	0.4%
1975-77	0.9%	1.8%
1980-82	1.1%	1.2%
1985-87	2.4%	3.0%
1990-92	2.9%	2.8%
1995-97	2.2%	1.8%

2000-02	3.1%	2.7%
2005-07	3.7%	2.2%
2010-12	2.5%	2.0%
To 80-82	0.2%	1.0%
85-87 to now	2.8%	2.4%
Overall	1.5%	1.7%

3.1.7 It is unknown whether or not this change in improvement is related to the introduction of universal superannuation from age 60 in 1977.

3.1.8 The probability of surviving to age 65 has also steadily increased. The following table shows the probability of a 20 year old surviving to age 65 based on the mortality rates from each census. As expected, the probability of survival has increased, most notably for Maori.

Census Years	Probability Survive from Age 20 to Age 65					
	Non-Maori		Maori		Total	
	Male	Female	Male	Female	Male	Female
1950-52	73%	80%	48%	49%	72%	79%
1955-57	73%	83%	52%	51%	72%	82%
1960-62	73%	84%	53%	53%	73%	83%
1965-67	72%	83%	54%	59%	71%	82%
1970-72	73%	84%	50%	60%	71%	83%
1975-77	74%	85%	56%	65%	73%	84%
1980-82	76%	86%	61%	70%	75%	85%
1985-87	77%	86%	67%	75%	77%	86%
1990-92	81%	88%	67%	75%	80%	87%
1995-97	84%	90%	64%	74%	82%	88%
2000-02	87%	91%	69%	76%	85%	90%
2005-07	89%	92%	72%	81%	87%	91%
2010-12	90%	93%	77%	83%	88%	92%

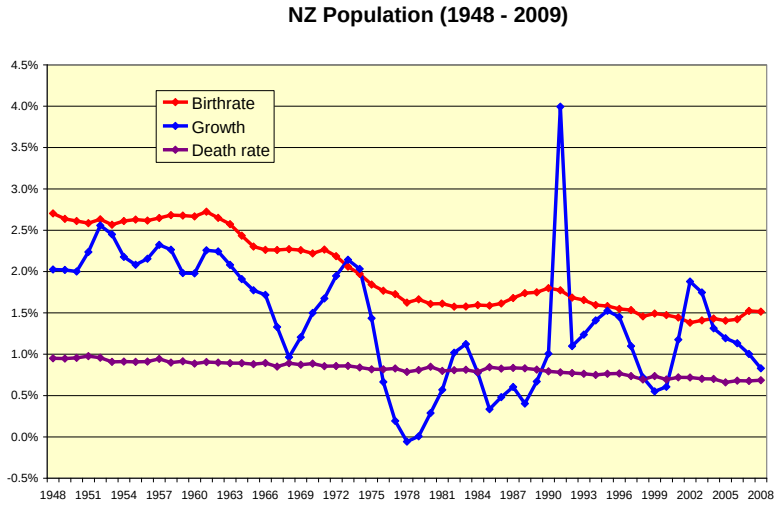
3.1.9 To indicate the improvement shown in the table above, to reproduce the same survival percentages as from the 1950-52 census, the corresponding age at 2010-12 would be 76 rather than 65. To have the same length of retirement (assuming survival to retirement age), the corresponding age would be 73. However, that is not a justification for raising the age of eligibility to NZ Superannuation by either 8 or 11 years!

3.1.10 In a recent report from the Institute and Faculty of Actuaries (UK), they commented on the State Pension Age (SPA) review. There was a calculation of the proportion of retirement compared to adult life (if life expectancy at 65 was 22 years and adult life started at 20 then the ratio would be 22 ÷ (22 + 65 – 20) or 33%). Of note was the following passage:

> *"Simple calculations show that if 67 is the correct SPA for 33.3% in, say, 2030, life expectancy for the 67 year old is survival to around 90. Changing to 25% would imply SPA of around 73 in 2030. A proportion of 25% could be justified historically. If we assume an SPA of 65 historically for men and women (to be consistent with the requirement that future SPA is equalised for men and women) then prior to the 1980s the average proportion of adult life spent post SPA was 25% or less. Since the 1980s life expectancy has risen rapidly, especially for men, and so the proportion of adult life spent post SPA has also risen. It is this rise in life expectancy (and commensurate rise in costs of state pension) which has stimulated the need to increase SPA."*

3.2 Population Changes

3.2.1 The NZ population growth has varied over time. This has been due to changes in the birth rate as well as migration. Improving mortality has had only a minor effect. The following graph shows the birth rate (births as a percent of population), death rate, and the total growth over the year. The spike in 1991 is likely to be either an inter-census data estimation issue (that was corrected as a result of that year's census) or a change in the definition of population.



3.2.2 The higher birth rate for the baby boomers is easily seen. The birth rate was over 2.5% until 1960 whereupon it dropped to 2.2% till the early 1970s. It declined over that decade to its current level of about 1.5%. The death rate has slowly declined over the period from about 1% of the population to 0.7% (despite the average age of the population increasing by about 4 years). Migration (not shown) has been around 0.5% per annum except from the mid 1970s to 1990 where it was mostly negative.

4 Accounting Treatment

4.1 Crown Financial Statements

4.1.1 The NZ Crown financial statements are prepared in accordance with the Public Finance Act 1989 and with New Zealand Generally Accepted Accounting Practice (NZ GAAP) as defined in the Financial Reporting Act 2013.

4.2 Welfare benefits and entitlements

4.2.1 The Treasury Guidance for the Crown Accounts notes:

> *"Welfare benefits and entitlements, including New Zealand Superannuation, are recognised in the period when an application for a benefit has been received and the eligibility criteria have been met."*

4.2.2 Whilst a literal reading of that statement suggests that the present value of *all future pension payments* should be recognised in the Crown Accounts when a valid application is made to receive NZ Superannuation, is not the actual interpretation. In fact only the actual cashflows in any accounting period (pension payments) are recognised.

4.2.3 Equally, the Treasury Guidance notes that:

> *"Expenses must be recognised in the period to which they relate."*

and

> *"Where grants and subsidies are discretionary until payment, the expense must be recognised when the payment is made. Otherwise, the expense must be recognised when the specified criteria have been fulfilled and notice has been given to the Crown."*

4.2.4 The former suggests that an accrual approach (actuarial cost) should be applied. The latter suggests a present value of future payments once the age of eligibility has been reached (and the request for payment). Again, neither of these two interpretations is correct as the "cost" is determined on a cashflow basis.

4.2.5 However, the treatment for the Government Superannuation Fund (GSF) is rather different. Although most sections are partially funded, there are two pay as you go sections (MPs and Judges). These two are actuarially valued in the same way as the rest. This difference is covered in the Standards for Public Sector Public Benefit Entities, PBE IPSAS 19:

> *These obligations of the Crown have characteristics similar to executory contracts in that the community will, collectively, provide funds to the Crown in the future under tax legislation, and the Crown will, in return, provide goods, services or transfers to the community in the future. Such obligations of the Crown include obligations to make future social welfare payments (such as to pay unemployment, domestic purposes and national superannuation benefits) and to deliver future health and education services, to the extent that the substantial funding of those benefits will be met through future taxation and other revenues and the intended recipients have not already satisfied the criteria for entitlement to those benefits.*

and

> *However, such obligations exclude the obligation of the Crown to fund future payments by the Government Superannuation Fund since the recipients of those future payments have already performed services giving rise to obligations.*

4.3 NZ Superannuation Fund ("Cullen Fund")

4.3.1 In the Treasury Paper "Governance of Public Pension Funds: New Zealand Superannuation Fund" (presented at the 2nd Public Pension Fund Management Conference, World Bank Headquarters, May 5-7 2003) it is noted:

"*The New Zealand Superannuation Fund has been established to smooth the impact this will have on the rest of the Crown's finances.*

The effect of the policy is to build up a portfolio of Crown-owned financial assets over the next few decades while the annual cost of New Zealand Superannuation remains relatively low. Those assets, along with compound investment returns, then will be drawn on progressively to supplement the annual Budget as the Crown's finances adjust to a much higher level of ongoing expense for New Zealand Superannuation. It is a smoothing mechanism for what remains fundamentally as a "pay as you go" universal benefit."

4.3.2 Note that it refers to supplementing the annual Budget – this is, in fact, merely a source of financing for the Government. Whilst it mentions smoothing this relates not to the cost (i.e., cashflows) but rather to the issuance (or not) of Government debt.

4.3.3 This rather surprising situation is related to the accounting treatment of the Fund. Transfers to and from the Fund are not expenses for the Crown. For example, the 2005 Crown Accounts notes (emphasis added):

"The financial statements for the year ended 30 June 2005 show an operating balance surplus result of $6.2 billion and a net worth of $50.0 billion.

The OBERAC (operating balance excluding revaluations and accounting policy changes) was $8.9 billion compared with $6.6 billion last year. Both net worth and the OBERAC have improved from last year reflecting continued economic growth.

The ***OBERAC surplus was sufficient to*** *fund capital needs and* ***set aside $2.1 billion for the New Zealand Superannuation Fund****."*

4.3.4 What this will mean (should the current accounting treatment be retained) is that there will likely be deficits in the accounts (due to the additional pensions payable to the baby boomers). Whilst external borrowing will be lower (due to transfers from the NZ Superannuation Fund), this will not

have any effect on the ***headline cost*** of providing NZ Superannuation. This is likely to place additional pressure on the Government of the day to "do something".

5 A Simple Model

5.1 Introduction

5.1.1 There have been a number of comments relating to the age structure of the population and the affordability of NZ Superannuation. Often the comment is made that "NZ Super is unaffordable in its current form". This is justified by reference to the "dependency ratio". This ratio is the number of working age people to each retiree (being defined as those aged 65 or more).

5.1.2 There are a number of factors that affect the dependency ratio. One is the fact that life expectancy is increasing, much of which is attributable to those aged 65 or more.

5.1.3 A second factor is the so named "baby boomer bulge". This bulge is a reflection of the temporary higher birth rates in the 20 year period following the conclusion of the Second World War (i.e., 1945-1964).

5.1.4 The improvement in life expectancy will permanently reduce the dependency ratio. Further improvements (and there is no indication of a pause or cessation) will continue to lower the dependency ratio.

5.1.5 The effect of the baby boomer bulge is quite different. Whilst these 'excess people' are working, the dependency ratio will be increased (more workers, same number of retirees). When they are retired, the will be an excess of retirees (and a normal number of workers) so the dependency ratio will be lowered. After they have all died, the ratio will return to normal. Thus the effect in this case is temporary.

5.1.6 There are other factors that will impact the dependency ratio. These include net migration, fertility rates, random fluctuations in mortality, and different changes in underlying mortality by age (even if overall life expectancy unchanged). Some of these are more important than others (i.e., have a larger effect).

5.1.7 To illustrate how various factors influence the dependency ratio a simple model is developed. The purpose of the various examples is to distinguish between "real changes" and "spurious changes" in the dependency ratio.

5.1.8 The latter "spurious changes" refers to a situation whereby two identical generations, experiencing exactly the same life (duration etc), have different dependency ratios. In actuarial pension terminology, the underlying experience of each generation suggests the same Standard Contribution Rate from birth. However, the cashflows differ between the generations. Thus the actuarial accrual (annual cost) differs from the cashflows. A change in the actuarial cost is a "real change" whereas a cashflow change is a "spurious change".

5.1.9 The difference between the cashflows and actuarial cost are, in fact, related to the current misunderstanding of the "cost" of NZ Superannuation. Under current accounting standards it is normal to use the annual cashflows as the cost/expense for that year when the benefit is **mostly or totally obtained within that same accounting year**. Where a benefit will be received over a number of years or in a later year, the treatment is different. Where a payment is made now and will be utilised over several years, the expense is regarded as a capital expense and is **depreciated over the relevant lifetime**. Where the benefit occurs in a later period (such as retirement gratuities) the **expected value** of the portion of the benefit relating to the current year (accrual) is booked as the expense.

5.1.10 If the birthrate is stable and there is no improvement in mortality, then the ratio of workers to retirees is stable. Subject to a few conditions, net

migration can also be included. This results in payments of NZ superannuation being a stable percentage of total wages. Thus a constant tax allowance on salaries each year would "fund" the pension payments. No actuarial calculations would be required which would have been a big advantage in the pre computer age.

5.1.11 It is doubtful that the above conditions (for a stable "cost") were considered when implementing and running NZ superannuation in its current form. Given the baby boomers resulted in underfunding, there would have been little incentive to review those assumptions and make appropriate policy changes.

5.2 Assumptions for Base Model

5.2.1 Here we assume that everyone born lives until they reach the expected age at death (same for both sexes) which does not vary over time (no change in life expectancy). There are a fixed number of births all at the start of the year and we assume no migration. Every person's life is broken up as follows:

Period of Life	**Start**	**End**	**Years**
Childhood	0	20	20
Working	20	65	45
Retirement	65	80	15

5.2.2 For simplicity we do not assume any change in benefit levels nor adopt a discount rate. Essentially, the discount rate is exactly equal to the rate of benefit increase. A discount rate would only be needed when calculating the actuarial cost.

5.2.3 Currently different pension levels are payable depending on marital status and living arrangements. For simplicity, this distinction is not made

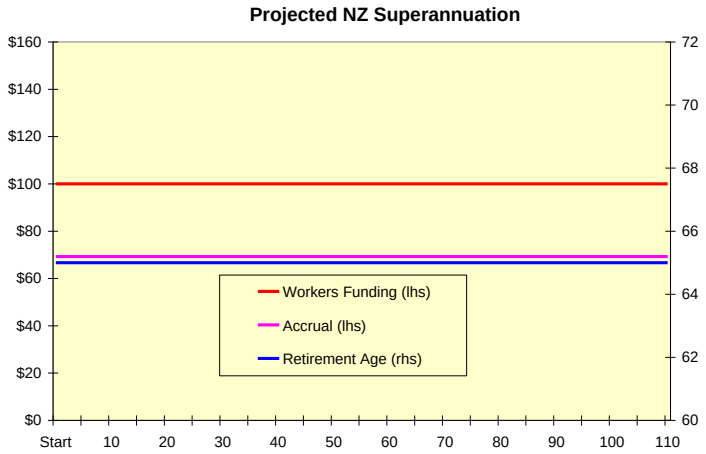
within the model. If we assume a standard pension of $300 p.a. for each individual, then the following calculations can be made:

	Years	Amount
Pension Rate	15	$300.00
Accrual (from birth)	65	$69.23
Funding (from workers)	45	$100.00

5.2.4 If there is a changing distribution with regards marital and living status, then the cost (and cashflows) will vary accordingly. The effect of this has not been addressed within this paper.

5.3 Stable Population ("perfect" PAYG)

5.3.1 Assuming a constant number of births each year and no change in life expectancy, we have a constant set of costs and payments as follows:



5.3.2 The Workers Funding is the amount each person would need to pay ($100 p.a.) *during their working lifetime* (age 20 to 64) in order to fund *their own pension* ($300 p.a.). It is also equal to the amount each **current** worker needs to pay each year in order to pay **current** pensioners their full pension (i.e., the PAYG model).

5.3.3 The costs and cashflows are summarised in the table below (assuming 1 person born each year).

	Number People	**$ per Person**	**Total Cost $**
Funding (from workers)	45	100.00	4,500
Pensions Paid	15	(300.00)	(4,500)
Net Cashflow			0
Actuarial Accrual	65	69.23	4,500
Change Liability Pensioners	15	(300.00)	(4,500)
Change in Past Service Liability			0

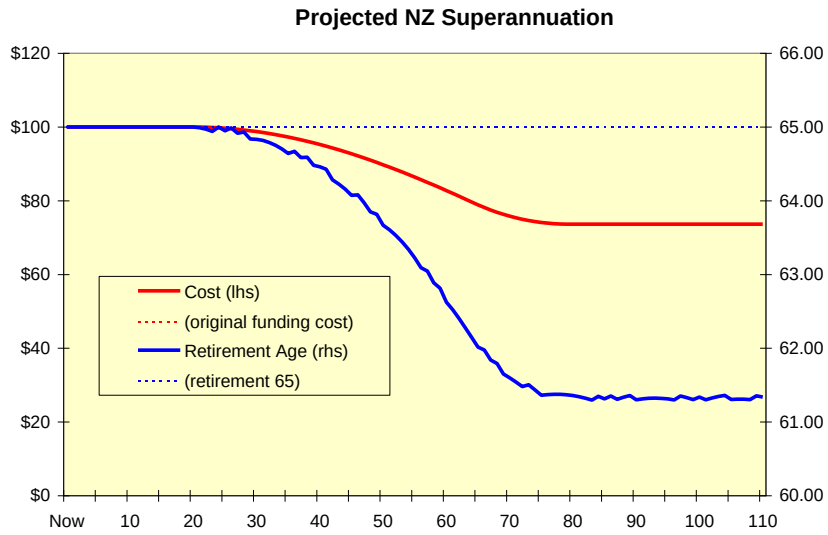
5.3.4 The actuarial accrual each year equals $4,500. The contributions for the year (funding) also equals $4,500. Benefit payments of $4,500 equal contributions. As everything at the end of the year is identical to the start of the year, there is no change in actuarial liability. Net cashflows are 0 so any fund will not change in size (as we have assumed a nil earnings rate).

5.4 Steady Growth in Population

5.4.1 For this example, we assume that the population is growing at a steady rate which occurs due to a constant percentage increase in the number of people born as compared to the previous year.

5.4.2 This assumption will change the ratio of workers to pensioners. To illustrate how this affects the cashflow based pension calculation, we introduce two new calculations. The first is the age of entitlement. In this case we calculate the retirement age which balances the contributions (at

$100 per worker) to the pensions paid (at $300 per pensioner). The second is the cost per worker. This is how much each worker needs to pay in order to fund the pensions based on the existing retirement age (age 65). Whilst the accrual (rather than Funding) could be used, this is less comparable to the current situation. The effects will be similar in each case (even if the magnitude of changes differs).



5.5 Baby Boomer Bulge

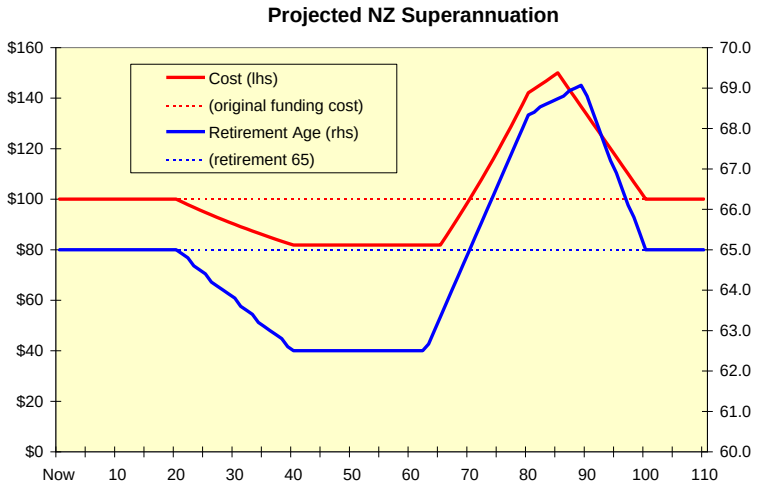
5.5.1 We now add extra births for a 20 year period to the initial model (i.e., assuming an otherwise stable birthrate). For the purposes of this example, we assume births are 50% higher than normal. After 20 years births revert to normal.

5.5.2 Using a normal birth rate of 10 per annum (and thus 15 during the baby boomer years) we can summarise how the population changes over time. A summary, including costs, is shown in the table below. The Funding Cost is calculated by how much each worker needs to pay to equal $300 per retiree (i.e., using a balanced PAYG mechanism). For example, at Year 75, this is $300 × 200 ÷ 500 = $120.

Period of Life	Start	Yr 20	Yr50	Yr75	Yr90
Childhood	200	300	200	200	200
Working	450	450	550	500	450
Retirement	150	150	150	200	200
Funding Cost	$100	$100	$82	$120	$133

5.5.3 Alternatively, we can work out a "break even" retirement age. In this case we assume that each worker pays $100 and each retiree receives $300. In order for this to balance, we need to adjust the retirement age. For example, in projected year 75 there are 530 people aged between 20 and 67 with 170 being older than 67.

5.5.4 Graphically we can see how the Funding Cost and break even Retirement Age varies by projection year. This is shown below.



5.5.5 In New Zealand, the mid-70s (when the current version of NZ Superannuation was introduced, with an age of 60) corresponds to projection year 30 in the graph above. The reduction in retirement age at that time was sold on the basis that it was affordable over the next few years.

5.5.6 We can see that the breakeven retirement age ranges from 62 up to age 70. The latter is similar to the ages being touted in NZ currently. But what is the difference between a 62 year old in projection year 60 and a 70 year old in projection year 90? Both were born, spent 20 years childhood, and then worked thereafter. The 62 year old, if they retired then, would have worked 42 years and will receive 18 years in retirement. The 70 year old, however, would have worked 50 years and then will receive 10 years retirement. Both die at age 80. This is hardly what you would call fair.

5.5.7 In terms of affordability, it would seem logical that the retirement ages should not be 62 and 70 for the two examples but rather 65 which is based on the actual cost over the lifetime as per the calculation in the original model.

5.6 Increasing Life Expectancy

5.6.1 We now assume that life expectancy increases by 1 year every 10 projection years. This means that for the first 10 years the age at death is 80. For projection years 11 to 20 this is increased to 81, and so on.

5.6.2 In practice improvements in mortality (resulting in increasing life expectancy) occurs at all ages. The effect is generally most pronounced in the first year (immediately following birth) and the older ages (in particular, after retirement).

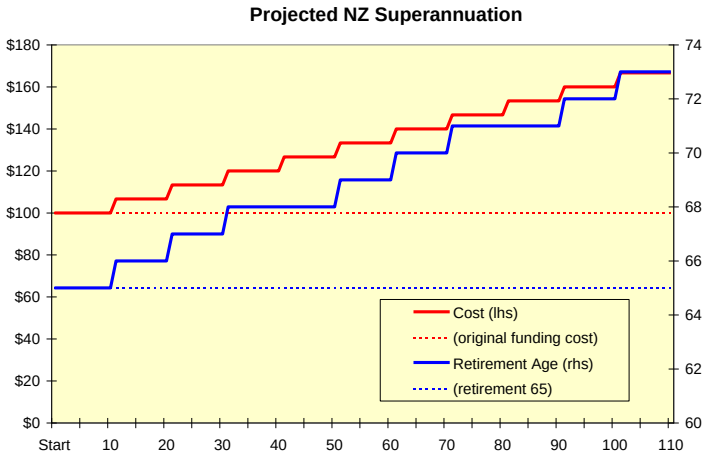
5.6.3 Currently most people survive to retirement; based on the latest life tables, 87.5% of males and 91.5% of females survive to age 65. If we allow for mortality improvement of 1.5% per annum (which is less than the recent improvement rate) then these probabilities increase to 93.6% and 95.7% respectively.

5.6.4 Current life expectancy at 65 is 19.0 years for males and 21.5 years for females. With a mortality improvement of 1.5% per annum, these rise to 21.0 and 23.8 respectively.

5.6.5 The approximate effect of a mortality improvement of 1.5% per annum is to increase the average working life by just over 1% and the retirement period by 10%. Thus little extra income will be obtained with the cost of providing pensions increasing substantially.

5.6.6 With a constantly improving mortality resulting in a longer life expectancy the resulting PAYG calculations are unsurprising. As the age at death increases, so does the cost of providing pensions. This is due to the ratio of workers to pensioners decreasing over time. Note that this is currently occurring in NZ although this effect is intermingled with the effect of the baby boomer bulge.

5.6.7 To keep the ratio of workers to retirees constant, the age of retirement needs to increase. Again, this is not a surprise. The change in cost or retirement age is shown in the graph below.



5.6.8 To be fair for an individual, their retirement age needs to be about 2 years older than that calculated for a PAYG balance when they reach retirement. This corresponds to the additional retirement that they will enjoy due to

the improvement assumed (1 year every 10 years). In this case, the retirement period will be around 18 years so they will get about 2 years additional pension.

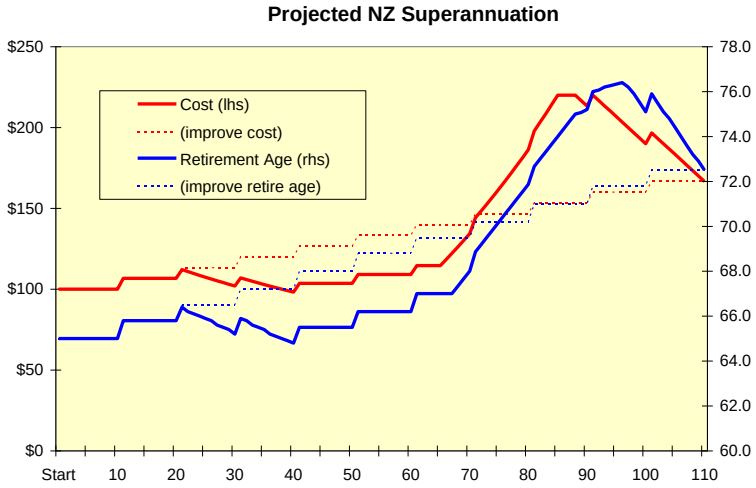
5.6.9 In actuarial terms, the unfunded liability increases. The increase is in proportion to the GDP so that the total unfunded liability remains a constant percentage of the economy. When the retirement age is increased, there is an additional year of work (and thus tax income) which increases the Governments income (and the size of the economy). Also, the cost of providing pensions decreases as there is one year less pension paid.

5.7 Boomers + Living Longer

5.7.1 We now combine the two effects that we previously looked at separately. That is, an increase of 50% in the birth rate for 20 years as well as an increase in life expectancy of 1 year every 10 years. These are assumed to start at the same time following a long period of stability (i.e., the initial model).

5.7.2 By comparing the resulting implied retirement age (or increased cost) for the combined effect against the results for just increased life expectancy, we can separately identify the temporary effect of the baby boomer bulge.

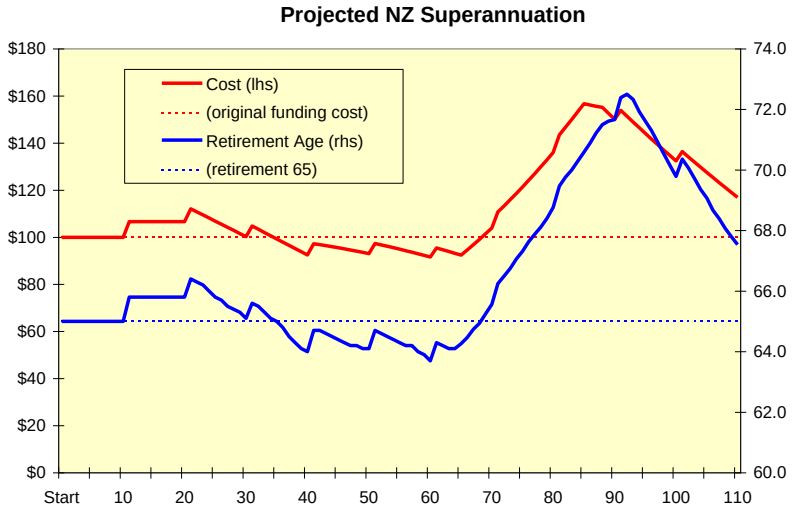
5.7.3 Initially, the extra boomers working act to offset some of the extra PAYG cost of mortality improvement (in this case, approximately negating the effect). As they retire, the additional cost (and retirement age) accelerates rather alarmingly. As the boomers die off, the cost (and age) drops back down to the level of the improvement only. This is shown below.



5.7.5 In terms of matching time periods, the start point would represent 1945 (the end of WWII). That would place us approximately at projection year 70 which is where the PAYG cost accelerates.

5.8 Boomers, Living Longer, Underlying Growth

5.8.1 We now look at what happens if we add growth to the previous model. The growth reduces the cost so acts opposite to the longevity assumption. The effect is shown below.



5.8.2 It should be noted that the growth assumption in the model is **additional** growth. For the actual experience match the effect indicated in the graph

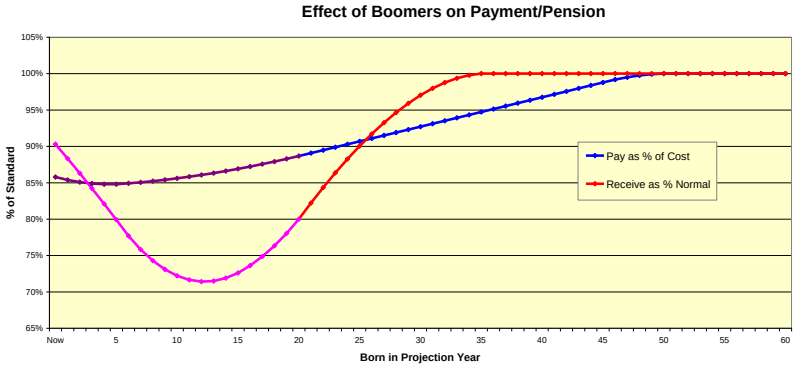
above, the assumed existing growth rate would need to increase by 1% per annum (essentially this means the current migrant flows would need to be sustained at the current percentage levels).

5.9 Capped Pension or Contributions

5.9.1 This time we look at what pension boomers (and later) would receive if we capped their contribution. Here we run a PAYG but do not allow the cost per worker to exceed $100. If there are not enough workers per pensioner, then the pension will be lower than $300.

5.9.2 On the other hand, if the number of workers is more than sufficient to cover the $300, then the cost per worker will fall below $100.

5.9.3 The following graph shows the amount paid and received depending on when the person was born (and covers their entire lifetime). This commences at the beginning of the boomers. The boomers are identified as the different colours over the first 20 years.



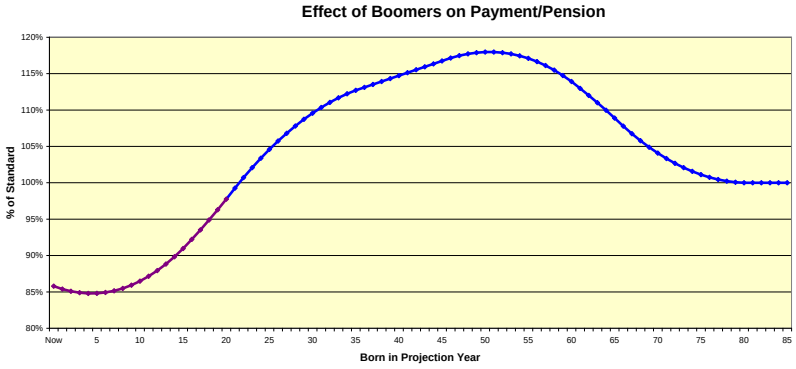
5.9.4 So what does the graph tell us? The boomers pay less than the cost of a full pension due to there being excess workers (when they are in the working age range) but only a normal number of pensioners. As there are non-boomers working when the boomers are working, the ratio does not reflect the full difference of the excess boomers.

5.9.5 However, when looking at the pension, the situation is more severe. For a number of years (5 in this example) there are only boomers in retirement but few if any still working. This means they suffer the majority of the 50% excess population with a low average pension received of 71%. As they die off and are replaced in retirement by the normal population, the ratio moves back to 100% (or the full pension).

5.9.6 The winners are the pre-boomer population who pay less (with the help of the excess boomers) but mostly receive a full pension (thanks again to the excess boomers). The post-boomer generation (Gen X) also do well by paying less than the cost but receiving a full (or near full) pension.

5.9.7 The losers are the boomer generation. They benefit by paying less than the cost of a full pension; however, they receive an even lower pension than that.

5.9.8 If we were to insist on a full pension always being paid then the amount paid, as a percent of the cost, is as show below.



5.9.9 In this case, the boomers pay less (as there are more of them to fund a normal number of pensioners) but receive the full pension. Their parents will also pay less (they are not shown on the graph). The losers are the later generations who have to pay more than the cost in order to fund the pension. This is the graphical representation of typical comments on the current "affordability" of NZ Superannuation.

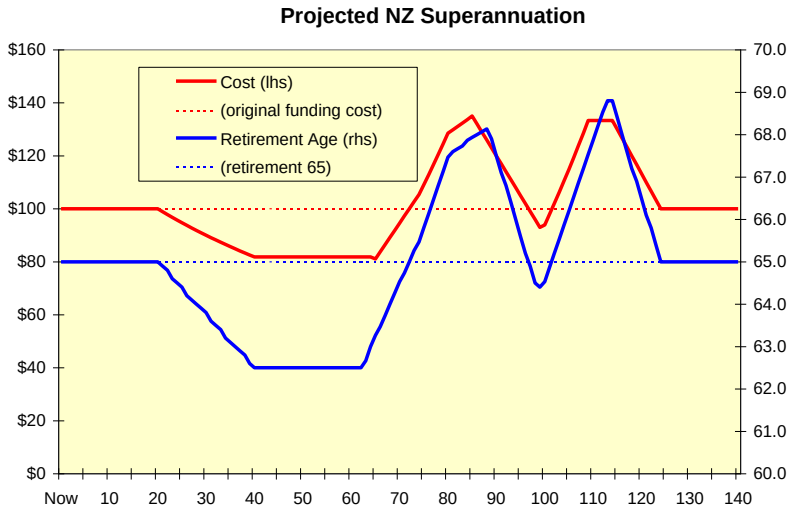
5.9.10 In each case there is an inter-generational transfer of wealth. For the capped cost, the boomers subsidise the generations either side of it. In the case of the fixed benefit, the generations after the boomers subsidise the boomers (and the boomers parents).

5.10 Adding a Migrant Boom/Bust to the Model

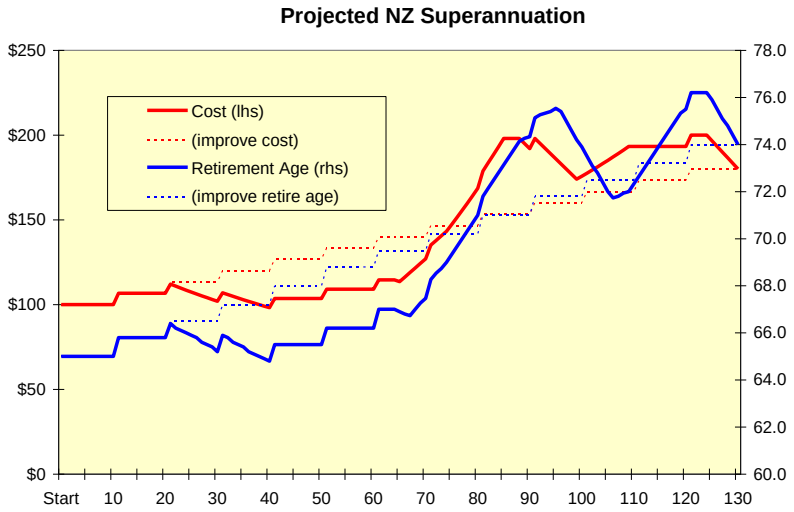
5.10.1 In New Zealand we are currently seeing large inward migration flows. Whilst this is not new it does mean that the population is increasing at a rate that might not be sustained in the future. This is comparable to the Baby Boomer case.

5.10.2 To see what effect this might have on NZ Superannuation, we add a temporary migrant boom to our model (as opposed to permanent which would correspond to the additional growth model). In this case we assume that migrants all aged 30 arrive over a period of 10 years with the same additional 5 extra each year (same as the assumed extra boomers in section 5.5, just older at entry).

5.10.3 We first add them to our model of boomers with standard mortality (not improving). In this case, as shown by the graph below, they arrive as workers and thus decrease the "cost". When they retire the same effect occurs as per the boomers retiring. Trying to adjust the retirement age to reflect the apparent cost will result in the retirement age rising, falling, rising again, before finally falling! This is despite the true actuarial cost being constant.



5.10.4 We now add improving mortality to this model. In this case the maximum cost occurs at year 85 (equivalent to 2030) and then remains broadly constant until the underlying cost catches up. If the age of retirement is adjusted to match the apparent cost, then the age will rise too early and will fluctuate more than the cost.



6 Other Countries and Options

6.1 Notional Defined Contribution ("NDC")

6.1.1 In 1981 Chile became the first nation to shift from a pay-as-you-go ("PAYG") scheme to a funded defined contribution ("DC") scheme. During the 1990s a number of other countries made similar moves.

6.1.2 During the 1990s a new model emerged based on the concept of "notional accounts". Pension schemes based on the Notional Defined Contribution ("NDC") model have been or are in the process of being introduced in Sweden, Italy, Poland, Latvia, Mongolia, China, and the Kyrgyz Republic.

6.1.3 A Notional defined contribution system treats a PAYG system like a defined contribution system. In practice, the PAYG scheme is split into two components: a pension calculated on a PAYG basis but mimicking a funded defined contribution scheme, and a redistributive element.

6.1.4 A NDC scheme generally closely links the benefit paid to each person's contributions along with interest "earned". The earnings are not actual earnings but rather based on a notional interest rate, normally tied to wage growth or overall economic growth rather than being based on specific (notional) assets.

6.1.5 When people reach retirement age, they purchase an annuity using the notional money in their account. In practice, there are often a range of options presented by the government, the level of which is based on the same calculations as conventional annuities used in the private sector.

6.1.6 The biggest difference between a Notional Defined Contributions scheme and traditional pension schemes is that it represents a switch from a

defined-benefit to a defined-contribution system. Most national pension schemes, including New Zealand, are run on a defined-benefit model, under which all citizens receive either a flat-rate or an earnings-related pension for life when they reach retirement age.

6.1.7 The contributions credited to an individuals account are normally based on their salary (e.g., in Sweden this is 16% of earnings). Most NDC schemes provide notional credit for certain categories of people who are out of the paid labour force for certain reasons. The contingencies covered vary but most include credit to a parent (typically the mother) who takes time off from work to care for their children.

6.1.8 A minimum pension benefit in NDC schemes can be used in order to ensure the adequacy of the benefits provided. This would be the case for low (or non) earners as well as those with little service (migrants, returning residents). In some countries, such as Sweden, the minimum pension is quite generous and as a result there is considerable redistribution; however, in other countries, such as Mongolia, this component is much more modest and the result is less income redistribution.

6.1.9 In terms of the Government accounts, there will be an expense each year equal to the notional contributions plus any top-ups for minimum pensions at retirement. Pension payments per se will not affect the accounts; however, as the Government is acting as a pension provider, there will be actuarial gains or losses (depending on how the experience differs from the assumptions used to calculate the initial level of pension).

6.1.10 It cannot be assumed that there will always be a balance between contributions received (from taxpayers) and pension benefits paid out. For this reason, some schemes operate a reserve buffer fund (e.g., Sweden).

6.1.11 The main advantages of moving to a NDC scheme are:

- pension benefits are closely related to contributions;
- NDC plans operate on a pay-as-you-go basis (avoiding the current generation of workers to pay twice);
- no financial risk (rates of return are not dependent on financial markets);
- generally less expensive to operate than funded account plans; and
- policymakers may find it politically easier to cut promised benefits in the context of creating a new system.

6.1.12 The main downsides are:

- less redistributive (lower retirement security for low-income workers and the part/non workers); and
- unlike funded schemes there is no advance funding (investment in capital markets).

6.2 China

6.2.1 The formal pension system in China is largely urban-based, PAYG and offers a defined benefit that depends on the worker's wage in the last year of employment. Retirees also receive housing and medical benefits.

6.2.2 In the past each state enterprise was responsible for paying the pension benefits of its own workers, on a PAYG basis. This meant that older enterprises with many retirees had far higher pension costs than young enterprises. Although wages were low, partial compensation was provided in the form of high wage replacement rates upon retirement. Since the proportion of old people was generally small and the government stood ready to fund any deficits, there were few problems. However, it became an increasing problem when China's economy

became more market oriented. Declining state enterprises found it difficult to keep their pension promises whilst uneven payroll taxes compromised their ability to compete.

6.2.3 The average replacement rate is over 80% of wages, compared with 40-60% in other countries. The duration of retirement is long due to low retirement ages, and exacerbated by rising life expectancy.

6.2.4 Realising that the costs implied under a PAYG system would become unaffordable and distortionary, the government decided to partially prefund its future pension obligations. Prefunding would not only smooth the contribution rate over time and reduce intergenerational transfers, it would also enhance economic growth by accumulating savings that would facilitate financial market development. The major difficulty in financing the transition from PAYG to funded is the need to pay the benefits of current retirees while also prefunding future retirees.

6.3 Sweden

6.3.1 During the 1990s, Sweden moved from a two-tier defined benefit scheme into combined notional defined contribution and financial defined contribution (FDC) schemes.

6.3.2 The reason behind this change was the expected intergenerational unfairness resulting from large future contribution rate increases needed to maintain the old DB system. There was also the additional goal of promoting mandatory financial saving through the pension system.

6.3.3 The contribution rate for the two mandatory and universal schemes is 18.5% of earnings. This is split of 16% for the NDC scheme and 2.5% for the FDC scheme. Both schemes are based on individual accounts. In the case of the NDC scheme the accounts are notional with the rate of return based on the average wage. In the FDC scheme participants have

individual accounts and choose their own investment portfolios from a large number of funds (this is similar to NZ's KiwiSaver).

6.3.4 There is a guaranteed minimum benefit level financed from general taxation.. There are also non-contributory credits (child care, military conscription, and higher education) to both the NDC and FDC schemes.

6.3.5 The PPM (Prempensionsmyndigheten) –Premium Pension Authority – administers the FDC scheme. The PPM is the clearinghouse for fund transactions, keeps individual accounts, collects and provides (daily) information on participating funds, provides information services to participants, and is the monopoly annuity provider (similar but wider responsibilities than the IRD in NZ with respect to KiwiSaver).

6.3.6 The PPM is the sole provider of annuity products. Retirees can choose between single and joint life annuities. Annuities can be fixed or variable rate annuities. Annuities are calculated using unisex life expectancy tables (as in the NDC scheme), which is in line with an EU laws regarding public pension schemes.

6.4 Japan

6.4.1 The National Pension is a public pension system participated by all persons aged 20 to 59 years who have an address in Japan, which provides benefits called the "Basic Pension" due to old age, disability, or death.

6.4.2 The contribution payable is a fixed monthly amount. The pension is payable from age 65 so long as at least 25 years of contributions have been made (full pension is payable for 40+ years, lesser periods are pro rated). The pension can be taken early or late with adjustment factors applying (70% at age 60 up to 142% at age 70).

6.4.3 There is also a second pension based on their earnings, financed entirely by their contributions. The basic pension and this earnings-based pension

replace an average of only about 25% of pre-retirement income. For this reason, many older Japanese, who had lifetime jobs with good benefits, have significant additional savings.

6.5 Means Testing

6.5.1 It is not easy to estimate the cost of administering a means test. In terms of overall operational costs, the administration of the Australian Age Pension costs approximately 3.6% of total benefit outlays (assuming equal costs across all benefits). This is similar to the estimate for the UK pension system of approximately 4%.

6.5.2 By comparison, administrative expenses of the US Social Security are estimated at 1.4% of total benefit payments. Administration costs in New Zealand (which is one of the simplest pension schemes in the OECD) is estimated to cost just 0.3% of benefit outlays.

6.5.3 This suggests that a means test would need to reduce pension costs by considerably more than 4% for it to be economically worthwhile.

7 Comments on Flexi-Super

7.1 Introduction

7.1.1 The idea of a variable retirement age is not new. This has applied to most company defined benefit schemes (both in New Zealand and overseas) as well as some State pension schemes overseas. The pension payable at the actual retirement age will be lower/higher than the standard pension (payable at "normal retirement age") for early/late retirement.

7.1.2 New Zealand does not currently have the option of varying the age of uplift for NZ Superannuation. One party, United Future (current MP Peter Dunne), has a policy position called FlexiSuper which proposes this optionality. Their proposal keeps the standard age at retirement (and the current criterion relating to the level of pension) at age 65 with the option of retiring between ages 60 and 70 with an adjusted pension level.

7.1.3 It should be emphasised that a policy of varying the retirement age does not necessarily affect the ***cost*** of providing NZ Superannuation. This is true as long as the pension adjustment is closely matched to the different actuarial cost of providing the pension from the alternative age (either younger or older as the case may be).

7.1.4 This option could provide a workable solution to the issue of whether a higher retirement age is practicable for manual workers. Whilst there are many good points relating to having a variable retirement age option, there are a number of practical issues that need to be considered before this can be implemented. A number of the more important issues are discussed in the sections which follow.

7.2 Equality Issues

7.2.1 The current pension is the same regardless of sex or race (i.e., male/female, Maori/Non-Maori). It is assumed that this will continue. Depending on how the percentage adjustment is made, for a particular individual there may be an optimal age for retirement in terms of maximising the total expected pension received. It would be expected that this effect would be small and unlikely to be a major driver of retirement age for any individual.

7.2.2 Persons in ill-health would maximise their benefit by taking the pension at the earliest possible age. This would have a cost overall to an unknown extent. Overseas, some annuity providers offer enhanced benefits (i.e., higher) on proof of ill-health. Whilst this option is not part of the proposal, it would be useful to at least consider this as part of any review of the terms of National Superannuation. Implementing an enhanced ill-health pension option will increase the overall cost (whilst providing an improvement in terms of fairness).

7.2.3 It is noted that the life expectancy of Maori is lower than that of Non-Maori (this is reflected in the tables produced by Statistics New Zealand). It would be a fallacy to assume that the whole difference is solely related to race. For example a smoker has approximately twice the chance of dying in any year compared to a corresponding non-smoker. With the proportion smoking for Maori (40%) being higher than non-Maori (25%) a sizeable proportion of the difference is due to smoking. A similar effect relates to the differing socio-economic groups (Maori are proportionally more prevalent in the lower socio-economic groups which suffer much higher mortality rates).

7.2.4 Therefore, any early retirement (on full pension) granted to Maori based on life expectancy differences might not be appropriate. It can be argued that the smoking difference is “self-inflicted” and not worthy of special treatment (although perhaps politically it might be hard to so). However, the socio-economic case could be seen to be more reasonable.

7.3 Selection Issues

7.3.1 As the percentage adjustment at each age is fixed, people can choose an age at retirement that maximises their benefit. How much this would be done in practice is unknown. Many of the lower socio-economic groups are likely to be in manual labour type jobs (if working) and are therefore could be expected to retire earlier. As they have a shorter life expectancy than average (which *might* change if they cease work at age 60) this will increase the value of pension received. Some of the reduced life expectancy is due to the higher smoking rates (as opposed to work and monetary related).

7.3.2 Workers in higher paid jobs are likely to defer their pension whilst working in order to *minimise tax paid*. This will have a detrimental effect on the overall lifetime cost. If they live longer than average then they will also receive a larger total pension by deferring.

7.3.2 One possibility is for people intending on retiring overseas who take the NZ pension from age 60. If they can move at age 65 (for example) and receive the full pension there then they are relatively much better off. Clearly if other countries vary their pension like NZ then this arbitrage opportunity would vanish (assuming the same percentage adjustment applies in the overseas country). There is also the issue of qualification for the overseas state pension so this might not be an issue in practice.

7.4 Calculation Issues

7.4.1 The calculation of the percentages for differing ages at retirement will be based on the expected value of pension received at each age. Consideration will need to be made on the rate of improvement in mortality in the future in the calculation process. If the actual rate of improvement is higher (lower) than that assumed, then the total pension is maximised by deferring (taking early).

7.4.2 The time value of money used in the calculation process will affect the percentage adjustments. A higher discount rate would result in a larger adjustment to the pension received.

7.5 Option of Purchasing Additional Pension

7.5.1 The option is for someone to voluntarily purchase an additional pension amount. The implementation of this will result in a fixed percentage being applied to each pension payment (assuming the purchased pension is indexed as per the standard pension). This could be by transferring some or all of their KiwiSaver to the pension pot. The exact amount may vary by age and, at least initially, may be restricted to early – pre 65 – retirements. In fact, a certain percentage of KiwiSaver may be *required* to be converted in this manner for early retirements in order that the resulting pension is above a certain (poverty) level. This latter requirement would minimise the risk of the Government needing to make additional payments to a pensioner due to hardship at a later time.

7.5.2 The purchase of pension from KiwiSaver could be for a temporary pension (at the standard pension rate) to cover the period from early retirement up to the standard age of eligibility. It could also allow for early access of the remainder of their KiwiSaver and would reduce any risks of hardship from taking early retirement.

7.5.3 This temporary annuity will be for a short period of time (although there is no reason why the retirement age could not be less than 60). As such the mortality and discount issues are relatively minor. Those in poor health could be treated individually in a more equitable manner (by variance of the purchase terms offered) allowing them to access the remainder of their KiwiSaver without being unduly penalised.

7.5.4 If some one subsequently permanently emigrates, the KiwiSaver enhancement may be converted to a lump sum (perhaps subject to a health

check first) or just continued up to the normal age of entitlement (as per the purchase terms).

7.6 Risks

7.6.1 If someone with little or no assets (and renting) elects to take the pension option at age 60 there are a number of risks. For example, if rents rise sharply, the pensioner may require additional Government assistance that would be less likely to occur had they received the full (normal) pension (letting them end up homeless and on the streets would have obvious political implications).

7.6.2 The above could be countered by having a means test (being either or both assets and income) for early retirees. Such a policy would need to be carefully thought through and clearly explained to the public. Again there is a political risk attached to such a policy. The downside could be minimised with the KiwiSaver additional purchase option.

7.6.3 Some people are unable to work due to sickness or because they are on ACC. Forcing these people to take the reduced pension from age 60 may not be politically palatable. Keeping the age 65 cease date would still be reasonable (i.e., not allowing them to remain on benefit followed by an enhanced pension at an older age) as there would be no additional cost compared to the current regime.

7.7 Married vs Single

7.7.1 As the benefits depend on age at uplift of the pension, consideration needs to be made with regards married couples. A simple solution would be to use the current percentage adjustment that applies (i.e., the percentage received by a married couple compared to two single pensioners).

7.7.2 This immediately raises a few issues. For example, does the percentage apply only when both are in receipt of the pension or when both are at an eligible age (which may be the minimum of 60 or the current age of 65)?

7.7.3 As a note, if the KiwiSaver enhancement is implemented, this should not be subject to the married couple adjustment. Even if not initially implemented, consideration of this should be made in respect of the computer systems so that any later implementation would not result in computer issues.

7.8 Tax

7.8.1 If KiwiSaver can be turned into an income stream, then part of each payment would be as a result of income on the lump sum converted with the rest being a return of the capital. To be tax neutral (of investing the KiwiSaver benefit and taking regular withdrawals) only the income part should be taxed. The mechanism used to make this tax neutral is not simple.

7.9 Migrants

7.9.1 In terms of immigrants, the pension they receive would depend on their age. If someone arrived in NZ aged over 55, they could apply for a pension after 10 years. Offering the full enhanced pension (as they would be a "late retiree") would mean a higher total pension than they would receive under current rules. In this case any adjustments for the pension should be based on the earliest age they could receive the pension (not age 65) and early retirement would not be an option (as they wouldn't meet the 10 year test).

7.9.2 A returning NZer could be aged over 65 and be eligible for the pension immediately. If they had received a pension in the country they are returning from, then they will be advantaged if an enhanced pension is offered. In this case the pension age assumed (for benefit calculation)

should be the age they started receiving the overseas state pension (or maybe 65 if younger).

7.10 Mortality Improvements

7.10.1 The percentages will be based on mortality assumptions at each age (i.e., probability of death). This may also include an allowance for future improvements in mortality. Allowance for benefit inflation in the calculation of appropriate discount rates will also apply (which might be either/both CPI and Salary).

7.10.2 These are assumptions and as such should be reviewed from time to time to check their appropriateness. As the pension adjustment is solely based on age, the mix of actual underlying mortality needs to be reviewed. This would mean considering changes in the percentage of smokers as well as the percentage of Maori (notwithstanding the comments made earlier regarding this issue). It would be expected that the proportion of male/female will remain fairly constant.

7.10.3 Improvements in mortality need to be considered. This may result in differing percentages. Equally, depending on cost considerations, some adjustment to the *normal age of retirement* (currently 65) might need to be considered (along with the timing and manner of implementation of such a change).

7.10.4 One option could be to adjust the level of pension at a specific age (e.g., age 65) so the total cost remains broadly constant. Then a minimum level of pension could be required to be received. If no (KiwiSaver) purchase is made, then the earliest allowed age of retirement can be calculated. Allowing late retirement of up to 5 years might be applied to this standard retirement age. Early retirement prior to that age (again perhaps 5 years, or maybe without restriction) would require the purchase of additional pension (the KiwiSaver option). This has the effect of automatically increasing the age of eligibility as life expectancy increases.

8 Options for Long Term Stability

8.1 Lifetime Model

8.1.1 We can look at providing NZ Superannuation on a lifetime basis. In this case we would project a cohort from birth through to death. The cohort would pay a proportion of their earnings (or more precisely, a portion of their taxes) towards providing their superannuation from the age of eligibility.

8.1.2 This lifetime approach has been implemented by the Ministry of Social Development for costing and assessing the effectiveness of various policies. It has also been suggested as an option for tax policy (Darryl Frank paper, Australian Institute).

8.1.3 One issue with lifetime models relates to any experience gains and losses. When these arise, a decision needs to be made as to how they are to be handled. By adjusting benefits for a cohort, the balance can be retained. However, the resulting piecemeal benefits payable (to different cohorts with different experiences) might not be regarded as practicable or desirable.

8.1.4 In a lifetime model we project a cohort from birth through to death. They will earn money and pay tax at varying levels (and rates) throughout their lives. We could allocate a portion of this to their retirement.

8.1.5 From the retirement age, they will receive a retirement benefit. This level could be based on their prior lifetime earnings (i.e., tax allocated each year rolled up with notional earnings). Currently it is based on a percentage of the National Average Wage after tax at the time of pension payment (and is updated each year).

8.1.6 A simple calculation can be made to equate the amount allocated (from tax) and the amount paid (as retirement benefit). This can be achieved most easily by setting two of the three following parameters and solving for the third:

- % of earnings (or tax) to allocate;
- $ amount of benefit payable; and
- age of eligibility for National Superannuation.

8.1.7 The experience for different cohorts is likely to vary. Therefore, in practice it will be necessary to have some form of smoothing.

8.1.8 Unexpected changes in mortality improvement after the revised age of eligibility has been set would not be captured by this method. Unless some form of dynamic pension level adjustment is imposed, the result would be a surplus or deficit for that cohort over their lifetime.

8.1.9 The question of moving from the existing PAYG to a (notional) funded basis also needs to be considered. One way would be to simply add the past service liability to current debt and continue from that point. This would have implications for the countries debt level and might affect its borrowing program. Alternatively, it could be recognised that a perfect PAYG population (stable growth and mortality) would not need funding. Thus only the liability in excess of this past service liability would need to be recognised in practice.

8.2 Ratio Retirement Period to Adult Life

8.2.1 In this case the retirement age is set so that there is a specific ratio of life expectancy at that age to the life expectancy from the start of adulthood. This is the method that will be used in the UK with a percentage of 33⅓%.

8.2.2 For example, using the start of adult life to 20 and an improvement of 1% per annum based on the NZ Life Tables 2010-12. In this case life expectancy at 20 is 67.2 years (averaging male and female). To have a ratio of 33⅓% we need to set the retirement age so that the expectancy is 22.4 years. This age is 65 years 10 months. If the ratio was 25% then the life expectancy at retirement needs to be 16.8 years which occurs at age 72 years 1 month. Note that these retirement ages include the mortality improvement from age 20 (the 45-50 years of 1% p.a. improvements add about 2 years to the calculated retirement age).

8.2.3 Every 5 years, following the census and publication of a new NZ Life Tables, the retirement age would be reassessed. Any change (perhaps subject to a materiality) would be phased in over time. There could be a specified delay before the change starts as well as the rate of change to the new age.

8.2.4 Whilst the underlying q rates can be easily determined there are other more problematical assumptions required. In particular, the rate of improvement which has varied in the past and might not improve at the same rate going forward. This can be alleviated to some extent as a cohort moves towards retirement as their historical q rates (including actual improvement) are known. As the period of improvement is shorter, any estimation errors are less significant. A mis-estimation of 0.75% p.a. in the rate of improvement will result in a difference of 1 year in life expectancy.

8.2.5 The age of being an adult could also be adjusted based on the census results. It would be expected that this would be a minor effect only. The proportion of adulthood in retirement could also be adjusted. This will affect the cost of providing benefits. This might be used to reduce the calculated retirement age (i.e., higher cost) when the age is deemed to be unreasonably high.

8.2.6 The retirement age is based on life expectancy. An alternative measure that could be used in place (or beside) this is Healthy Life Expectancy. This will be a shorter time period the full life expectancy. The difference may change due to medical advances (either upwards or downwards in terms of difference). A minimum percentage based on healthy life expectancy could be imposed which may alter the retirement age otherwise calculated.

8.3 Jobseeker Benefit vs NZ Superannuation

8.3.1 There are many welfare payments that the Government makes. One of these is the Jobseeker Benefit (previously, in practice, the unemployment benefit). Payments made depended on the unemployment rate which itself was a function of the business cycle.

8.3.2 During an economic slowdown (or recession) the unemployment rate rises sharply. There is little demand for the benefit to be cut sharply (or for entitlement terms to be substantially tightened). It is recognised that this is a temporary state of affairs and that during the subsequent economic recovery the rate will fall (and thus the cost decreases).

8.3.3 Essentially, the benefit level and terms are not adjusted as the Government looks at the cost over the ***whole business cycle***.

8.3.4 A similar exercise can be performed for NZ Superannuation by looking over a cohort's lifetime. This is the rationale behind the NZ Superannuation Fund.

8.3.5 Where this differs from the Jobseeker example is the structural change in the cost of NZ Superannuation due to mortality improvements. This makes it difficult to distinguish the two effects which impinge on the ability of policymakers to manage the underlying cost.

8.3.6 One practical solution to this would be to separate the two costs. In this case, however, it would be necessary to change the accounting standard to make the smoothing transfers to occur in the OBEGAL (rather than out of the surplus or adding to the deficit as is the current case). The transfers would be in terms of a liability which could be partially (or fully) funded (i.e., the NZ Superannuation Fund).

8.3.7 Now would be a good time to implement any such accounting changes as it will not have a positive change in the accounts (higher surpluses) but rather the opposite. This would reduce (but probably not eliminate) any calls of the Government "cooking the books".

9 What Can/Should We Do?

9.1 Pension Structure

9.1.1 Currently NZ Superannuation provides, with a couple of caveats:

- universal entitlement;
- same benefit to all;
- benefit level based on average salary;
- non-contributory;
- single retirement age; and
- annual inflation adjustments.

9.1.2 There is a residency requirement although that is fairly minimal (particularly by international standards). In addition, there are variations relating to marital status and living arrangements.

9.1.3 The features of NZ Superannuation are that it is easy to understand, widely accepted, and has a low cost of administration. There does not appear to be any compelling evidence or groundswell to make major changes. Indeed, most comments are based solely around the age of entitlement.

9.2 Education

9.2.1 It is not unusual to see comments referring to a doubling or tripling of the cost including from politicians and government officials. Whilst some refer to the fiscal cost (i.e., cashflows) most imply an actual cost. There is also a muddled message in reference to longevity and baby boomers and the costs.

9.2.2 What is clear is that there is little or no understanding of the relative importance of the temporary effect of baby boomers and the ongoing effect of increases in life expectancy. Another common fallacy is using life expectancy at birth when comparing the time in receipt of a pension (from age 65).

9.2.3 In my opinion it would be beneficial to explain how PAYG works, where it "fails", and what the true state of affairs in NZ is both now and in the decades to follow.

9.3 Political Involvement (or not)

9.3.1 The ideal is a retirement solution that adjusts automatically and has no input from politicians. Oh look, a green pig just flew by my window! Indeed, getting universal political agreement of a system that then does not involve future decision (or only a few minor ones) is not something that is seen as achievable at present.

9.3.2 What would be an improvement is if the underlying cost is calculated. When a change is suggested (Government or opposition party) then this can be costed accordingly; namely, the annual cost change as well as any temporary cost changes (such as the baby boomers). This would help to discourage "kicking the can down the road".

9.4 Public Involvement

9.4.1 The preference is for any policy implemented to have the broad support of the public. To achieve this, a policy would need to be clearly understood as well appearing fair to most people. Clearly "fair" can be interpreted in a number of ways.

9.4.2 Apart from the retirement age, there is no groundswell to change any of the features of the current system. For this reason, I would retain the current system (except for the age of entitlement).

9.4.3 Arbitrary or ad-hoc changes to the retirement age (especially if lifted by 5 years in a relatively short period of time followed by a long period of no change) is less likely to be accepted than an automatic system. Ad-hoc changes are likely to be subject to intense lobbying to defer the change, particularly by those most affected.

9.4.4 The current level of pension seems to be adequate to ensure minimal poverty in retirement (for those without other income) so I would be inclined to retain it.

9.4.5 As per 8.1.6, this then comes a trade off between cost and retirement age. The idea of using a % of working life is quite appealing. A ratio of 33⅓% means that for every two years of adult life (pre retirement age) you "earn" one year of retirement (for 25% that becomes 3 years pre-retire to each year of retirement). This would be *relatively easy* to explain to the public.

9.4.6 Following each census, new calculations can be made to update life expectancies. A required increase could be implemented starting in say 10 years and adding 1 month to the retirement age each 6 months (or more frequent so fully implemented within 5 years).

9.4.7 The variable retirement age would need some work before being suitable to add to the mix. This is probably best left to after a new system is bedded in so as not to confuse the issue.