PIE Working Paper 2026-1

To Save or Save Not: The economics of SAYG and PAYG retirement income schemes: is there another view?

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Abstract

Periodically, academic economists rediscover seductively appealing theoretical models that prove that SAYG retirement schemes are inherently superior to PAYG schemes. Typically, these expositions are couched in language peculiar to the overlapping generations literature. Lay persons not versed in such modeling techniques may find the arguments confusing and counter-intuitive. This may lead them to defer to the expertise of economists. However, women are likely to be skeptical as they cannot see the reality of their lives reflected in these models. The invisibility of the work of women in procreation and nurturing might have been explicable in the early papers on this topic mid-last century but sits strangely in the 21st century.

In recent years in New Zealand, several theoretical papers have been written that have the potential to be influential in policy debates. Indeed, their authors expect them to be. Such papers often point to Australia or Chile as proof of the validity of a more SAYG approach than is current in New Zealand where there has been a strong PAYG system. This paper explores the theoretical nature of such enquires, their lack of gender analysis, the lack of a macroeconomic framework, their strong implicit equity assumptions, and the influence of the financial services industry. The central question to answer is whether they have any potential for informing policy reform in New Zealand in positive directions.

[1] PIE republishes this paper first delivered to the 21st Annual Colloquium of Superannuation Researchers Sydney, Australia, 2013. The author acknowledges the original helpful comments from Michael Littlewood and Dr Claire Dale, Retirement Policy & Research Centre (RPRC), Business School, University of Auckland.

Introduction

Periodically, academic economists rediscover the seductively appealing use of theoretical models to prove that Save As You Go (SAYG) retirement schemes are inherently superior to Pay As You Go (PAYG) schemes. The genesis of such models goes back to Samuleson (1958), Diamond (1965) and is perpetuated in such writings as Feldstein & Liebman (2001). A recent example of a reworking of these models to reinforce the traditional finding of superiority of SAYG over PAYG can be found in Bruce & Turnosky (2013).

Typically, these expositions are couched in language peculiar to the overlapping generations literature and are usually highly mathematical and technical. Lay persons not versed in such modeling techniques may find the arguments confusing and counter-intuitive. This may lead them to defer to the expertise of economists. However, women are likely to be skeptical as they cannot see the reality of their lives reflected in these models. The invisibility of the work of women in procreation and nurturing might have been explicable in the early papers on this topic mid-last century but sits strangely in the 21st century. Moreover, women are not the only ones likely to experience a disconnect from these models as non-standard labour market histories in a world of increased casualisation of work and entrenched unemployment become widespread.

In recent years in New Zealand, several theoretical papers have been written that have the potential to be influential in policy debates (see for example Coleman 2011; Coleman 2012; Coleman 2013). Coleman (2013) points to Australia as proof of the validity of a more SAYG approach than is current in New Zealand where there has been a strong PAYG approach. The essence of the Coleman thesis is taken from the work of Feldstein, and in particular Diamond (1965):

> *[Diamond] showed that if the return to capital was higher than the rate of economic growth (per capita income growth plus population growth), any level of pension could be funded with lower long run contributions under a [SAYG] system than a [PAYG] system because the contributions made when a person was of working age would be invested in productive capital, earning a return that compounds quickly through time.* (Coleman, 2012)

Typically these studies omit to acknowledge the critiques of the SAYG literature, such as offered by economist Nicholas Barr. Diamond also has since been associated extensively with Barr, co-authoring for example, *Reforming Pensions,* Barr and Diamond, (2008). In a recent paper, Barr and Diamond (2010) emphasise the lack of certainty and wide variability as to what pre-funded schemes can and do deliver.

This paper explores the theoretical nature of such enquiries, their lack of gender analysis, the lack of a macroeconomic framework, their strong assumptions about equity and the influence of the financial services industry. New Zealand faces increasing costs as the population ages as do other countries. The central question is whether these models and way of thinking have any potential for informing policy reform in New Zealand in positive directions.

Background to New Zealand's retirement policies

In 1898, New Zealand introduced the old-age pension to provide some protection for the 'deserving poor' aged over 65. Today, the foundation of the retirement income framework

is New Zealand Superannuation (NZS), a flat-rate, universal, taxable benefit, paid out of current taxation as described in the New Zealand Superannuation and Retirement Income Act 2001 and its various amendments.

Eligibility for NZS occurs at age 65, after meeting the New Zealand residence requirement of 10 years after age 20, with at least five years after age 50.[2] Individual entitlement applies: each partner of a married/co-habiting couple receives a pension that is taxed with other individual income. The combined net NZS rate for a couple with no other income is at least 66% of the net average wage (33% per person).[3]

Table 1 shows the dollar amounts of net NZS for superannuitants paying the lowest (10.5-17.5%) and highest (33%) tax rates.

Table 1. New Zealand Superannuation rates at 1 April 2013

Category	% of net average wage	Annual rate	Annual Net	Annual Net
		NZ$ (gross)	(Primary Tax)	(Tax at 33%)**
Single, living alone	43%	$21,337	$18,586	$14,2956
Single, sharing	40%	$19,607	$17,156	$13,136
Married person or partner in civil union or de facto relationship (each)	33%	$16,138	$14,297	$10,812

Source: Work and Income website: http://www.workandincome.govt.nz/. Note: supplementary income-and asset-tested benefits may also be paid.
** The columns show the amount retained in net terms when NZS is all taxed at the top tax rate.

New Zealand's state pension NZS is unique internationally and is best seen as a sophisticated yet simple variant of social insurance: it is neither earnings-related nor contributory but fulfills the role of a basic individual income, and ensures very low rates of pensioner hardship, despite high rates of severe and significant hardship among those on welfare benefits (Perry 2009). The Retirement Commissioner described NZS as:

> *…a remarkably effective, simple and secure foundation for retirement income. It means that New Zealanders - and especially women – are less at risk of hardship in later life than people in many developed countries.* (Crossan 2007)

As well as the simplicity of NZS, and the consequent administrative advantages, New Zealand's age pension design and delivery means there is no residual value to be appropriated to an estate in the case of death, and there are no messy issues around spousal pensions and divorce. There are undoubtedly changes that are needed to maintain fiscal sustainability but when judged against the goal of securing a reasonable standard of living for all older people, the New Zealand basic pension is highly cost-effective.

The New Zealand Superannuation Fund (NZSF) and the Guardians who run it were established under the New Zealand Superannuation and Retirement Income Act 2001. The NZSF provides some pre-funding of NZS, as a tax-smoothing device rather than introducing any contributory element into NZS. Its rationale was, in part, to mop up some

[2] The residence requirements can also be achieved after age 65.
[3] NZS is indexed annually via the Consumer Price Index until the current floor of 66% is reached, then rises with the net average wage.

large fiscal surpluses in the early 2000s and preclude the demand for tax cuts. In 2008, contributions to the fund were suspended as fiscal deficits began to emerge. Nevertheless in 2013 there are substantial assets in the fund. It is now not expected that the fund will ever be run down but eventually the investment returns will be used to help pay for the tax-funded NZS.

KiwiSaver was introduced in 2007 as an auto-enrolment, opt-out saving scheme to provide supplementary savings for retirement. The current arrangements are an initial $1000 kickstart and a 50% subsidy for the first $1040 per annum of saving for those over 18 years. Employees who are members contribute 3% of after tax wages and employers match with another 3% taxed at the marginal tax rate of the saver. The contributions are mandatory, unless the individual opts out of the scheme or takes a contributions holiday. Funds may be accessed at age 65 but not before, unless financial hardship is proven.[4]

Background to the recent debate in New Zealand

While there has been remarkably little major change to New Zealand's basic universal age pension since its introduction in 1977, the debates around how policy should change have been intense. One of the recent critical debates is about the future role of KiwiSaver and its possible relationship with NZS. For example, Coleman, a Motu and Treasury economist, has written at length proposing a change from a PAYG to a SAYG approach for retirement income, using arguments drawing on rates of return and particular concepts of equity (Coleman 2011; Coleman 2012; Coleman 2013).

In 2012, the Financial Services Council, the representative body for financial services including KiwiSaver and life insurance providers, produced a report suggesting that "under very conservative assumptions, saving is likely to be at least 60% more efficient than taxation funding for retirement incomes" (Financial Services Council 2012). Further, at the long-term fiscal projections conference, *Affording our Future*, held 10-11th December 2012, Sir Michael Cullen, former Minister of Finance proposed reducing future spending on NZS to zero by a switch to SAYG KiwiSaver funding (Cullen 2012).

To determine whether New Zealand should rely more on SAYG and less on PAYG a critical look at some of the models that have been used extensively in policy debates elsewhere and in New Zealand is needed.

At its simplest level, protagonists for the SAYG approach in New Zealand believe that an appropriate mix of more SAYG and less PAYG could make future retirees (those aged 20-40 today) around twice as well off than without the shift. The argument hinges on the belief that the shift will result in more saving; that in turn means more investment; that in turn means higher growth and a bigger output of useful goods for the support of the ageing population. The connections are by no means straightforward or guaranteed however. The argument is, moreover, conditioned by the normative proposition that it is not unfair to make the current working generation pay twice. This paper argues that such normative judgements are questionable, that the economic reasoning confuses what is best for the economy with what is best for retirement income policy. Furthermore, this

[4] For a discussion of the evolution of KiwiSaver since its inception see St John, S., M. C. Dale, et al. (2011). KiwiSaver: the first four years. Auckland, Retirement Policy and Research Centre.

debate may be distracting us from doing the things that should be done *urgently* today to ensure sustainability of the current PAYG scheme.

The savings debate

Much of the confusion of the SAYG/ PAYG debate hinges on the kind of saving being discussed. In particular, individual saving is different to national saving: the claim that New Zealand has a saving problem does not inevitably lead to the conclusion that individuals should save more, let alone that they should save more for their retirement in managed funds such as KiwiSaver.

Since the 1990s New Zealand has run a tight monetary policy to contain inflation, at the cost of a high real interest rate and a large current account deficit (CAD). The need to finance the large CAD by new overseas borrowing or asset sales provides the evidence of an implicit national saving problem. Because of past CADs, the New Zealand economy is in the unenviable position of having accumulated one of the highest net international liabilities/GDP ratios in the OECD. This figure peaked at 90% of GDP in 2009 (Statistics New Zealand 2010) but had fallen back during the recession to 70% of GDP by June 2011 (English 2011). Because the Government was itself running large fiscal surpluses, the CAD was seen to be a consequence of low private saving, and particularly of households borrowing for housing and consumption.

The recession post 2008, driven by the global financial crisis, and the costs of large earthquakes in the second largest city in 2010, caused a rapid deterioration in the fiscal position. In the recessionary years 2008-2011, the CAD improved, but the structural issues relating to the external accounts were not addressed, with predictions that a return to economic growth would once again cause the CAD to rise rapidly (Minister of Finance 2011). Indeed projections in the 2012 budget show net international liabilities rising to 80.8 per cent of GDP by March 2016, a $204 billion liability. The primary driver of the high external debt was said by the Minister of Finance, Bill English to be New Zealanders paying high prices for houses and borrowing most of the money offshore.

Despite informed challenges (including Le, Gibson et al. 2010), the lack of household saving is held by many to be the cause of New Zealand's poor economic performance and indebtedness (see for example Bollard, Hodgetts et al. 2006; Gaynor 2008; Fallow 2010; Bennett 2011; Perry 2011; Savings Working Group 2011). This local lack is compared unfavourably with the good fortunes of Australia, New Zealand's closest neighbour. There, a much stronger economy and higher productivity is often attributed not to its vast mineral wealth, but to its compulsory superannuation scheme adding to the capital base thus encouraging domestic investment and strong growth (The NZ Institute 2010).

In the climate of the mid-2000s, KiwiSaver was conceived as a way to address the national saving problem, while, at the same time, there was a view that it was important to improve the income security of future retirees. On the eve of the introduction of KiwiSaver, the Minister of Finance, Michael Cullen, said:

> *KiwiSaver now presents the chance for a new beginning for New Zealand in terms of saving and investing. It is the individual's equivalent to the New Zealand Superannuation Fund – the opportunity for greater security in retirement. At the same time it will significantly increase the flow of funds in New Zealand for investing both here and overseas. The effects of such funds can be seen in Australia. By some*

measures Australia is now the world's fourth largest offshore investor. We, on the other hand, are one of the world's largest borrowers relative to our size. (Cullen 2007)

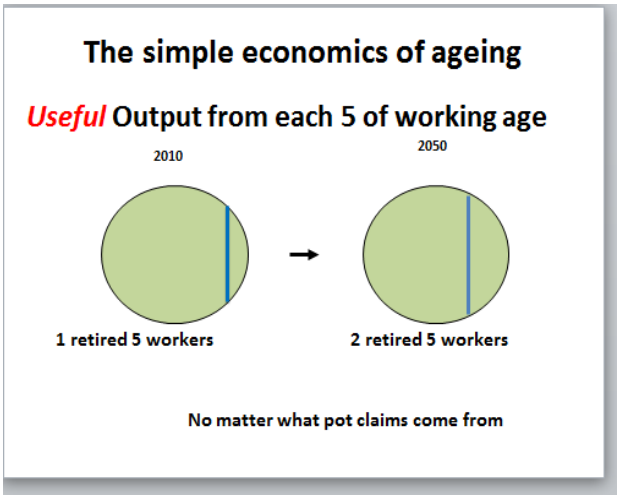
In 2010, the Labour Party (now in Opposition) was still suggesting that more household saving would be the solution to New Zealand's economic problems (Wilson 2010). In the election campaign in 2011, Labour proposed to achieve this by making KiwiSaver compulsory and by restarting contributions to the NZSF.

Government contributions to the NZSF had been put on hold in 2008 when the fiscal position deteriorated. With assets in NZSF of $NZ 23.17 billion as at 31st May 2013 (Guardians of New Zealand Superannuation 2013), it could be said to have delivered on its promise of being a way in which the government could save on behalf of New Zealand households. It does not however change the cost of the state pension, and the ring around the NZSF assets on the balance sheet does not mean they could not be used for other purposes, as in, for example, a crisis. Littlewood (2010) makes the point that these assets make government debt on the balance sheet correspondingly higher, and that to be justified such a fund must achieve a higher rate of return than the interest paid on debt.

The economics of pensions

In political circles it is often implicitly assumed that pension policy impacts significantly on macro-objectives and can bring about enhanced national saving as a means of alleviating the burden on future workers as the population ages. But changing retirement income policies (for example, PAYG to pre-funded SAYG, defined benefit to defined contribution, introducing tax incentives, etc) is not a magic wand that can solve the resource allocation problems posed by an ageing population. The quantity and quality of real goods and services available to be shared is the important factor (Barr, 1998, 2000, 2001).

Of course, in choosing pension design, it is important to not compromise other worthy often inter-related economic goals, such as growth and national saving. But there is little supporting evidence that a change in pension design in itself will favourably affect these macro-objectives. Thus while more saving by individuals for their retirement may be a good thing for them, and may be enhanced under one policy rather than another, the overall macro outcome for national saving may be little affected.



The demographics show that the output currently produced by every five people of working age must be shared with about one retired person. By 2050 however, the output of every five people of working age will have to be shared with just over two retired persons (assuming an age of retirement of 65).

The economic implications are clear, with a fixed pie, the pain of the ultimate resource division between young and old remains unchanged. The source of claims on output, be it from private pensions, social security or past savings, is not particularly important. Growth may help by making the absolute sacrifice of the working age population less painful, but if relative living standards

are to be maintained, growth alone does not affect the necessary division into sevenths rather than sixths.

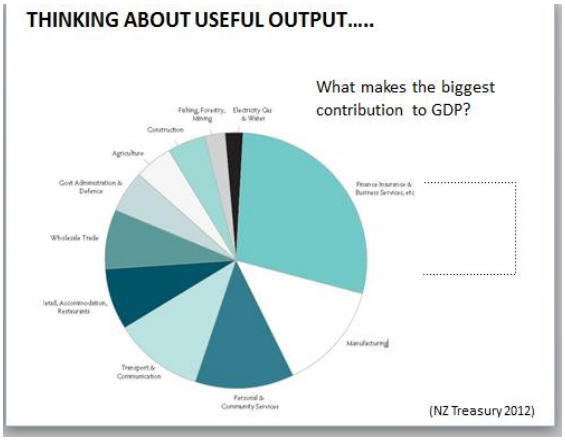
The argument is not that growth is unimportant. But in developed countries there is little empirical evidence that growth of the economic pie can be increased significantly by *changes to the way pensions are financed*. For a beneficial impact to occur, first more national saving actually has to be generated. There is no point in increasing household saving if its price (tax incentives for instance) has an offsetting impact on government saving. Similarly, subsidising one form of saving such as pension plans, may simply cause a shift of household saving into the preferred saving vehicle and may actually decrease household saving as the individual saving goal can now be reached with less effort. The shift in Chile from PAYG to SAG in 1981 was expected by the World Bank to produce economic growth through higher savings. Holzmann (1997)(1997) however found that while there were some gains from the shift 'the direct impact of the reform on saving was low, and initially even negative'. In the case of Australia, concerns have been raised that while superannuation savings have risen, behavioral change has acted to offset this by increasing household debt as discussed later.

In general, even if total national saving arising from pension funding is higher, this increased saving does not guarantee growth as it does not guarantee either more or better investment. Even if productive investment opportunities are available, it is not obvious that they require the prior act of increased saving in order for them to be exploited. For example, the development of Google required little initial investment relative to the wealth and growth opportunities that have flowed from that innovation. Moreover in a world of mobile capital, domestic investment is not constrained by domestic savings.

As Barr and Diamond (2010, p6) are at pains to emphasise, the effects of funding will differ depending on their precise nature and the particular economy and there is no one right answer:

> *First, an increase in saving may not be the right objective, particularly in a country where the saving rate is already high (for example, China). Second, a move to funding may or may not increase saving. For example, funding through the issue of new government bonds will not do so. Similarly, increased mandatory pension saving may be largely offset by declines in voluntary private saving or by increases in government borrowing, perhaps to help finance the transition costs of a move to a regime with more funding. Third, formal capital markets may or may not allocate funds to investment more effectively than informal capital markets. Gains in the effectiveness of capital markets will depend on effective administration and on political support for improved regulation. Thus, funding may increase national saving or expand explicit public debt, or both; and it may improve the operation of capital markets. Either is possible; neither is inevitable. The economic case for funding has to be analyzed in each country.Yet despite these arguments, many official commentaries (see for example World Bank 1994) have stressed the need to reduce the public component of retirement incomes, and advocated various degrees of privatisation and prefunding. The implication is that this type of reform will resolve the extra pressure on resources implied by an ageing population. But as Barr (2001) points out, privatisation of an unsustainable public pension system does not change anything; the only gains will come from reducing the generosity of pensions. Suitable reforms to the public scheme, without privatisation, might also achieve this end. Perhaps privatisation is the vehicle*

for making such reductions more acceptable, but privatisation itself may present a raft of other problems for society, including higher administration costs.



In advocating for an expansion of SAYG, the size of the existing financial services contribution to GDP must be remembered. Barr's famous statement in *Myths my Grandpa taught me* (1979) 'you cant eat pound note butties'; might be adapted to say 'you cant eat the services of the financial sector'.

Another much neglected macro issue is analysis of the implications of the rapid growth of pension funds that are largely outside of the regulatory controls over the banking sector. As is outlined by the 2007 UN World Economic and Social Survey, since 1990 the banking sector has been increasingly bypassed for intermediation purposes.

> *What is clear, though, is that an increasing share of household savings flows into pension funds and other financial investment plans for retirement. Institutional investors, which typically manage such savings, have already become the main players in financial markets. These investors manage not only large amounts of household savings from developed countries, but also, increasingly, savings from developing countries where the importance of privately managed capitalized pension systems has grown … Institutional investors can play an important role in deepening financial markets and providing additional liquidity for long-term investment projects. At the same time, however, institutional investors largely operate outside of financial market regulation and supervision mechanisms that apply more generally to the banking system.*
> *…If unchecked, the financial market operations of pension funds could thus be a source of financial instability. Also, as increasing financial investments are intermediated outside of the banking system, the control of monetary authorities over credit growth tends to weaken the effectiveness of monetary policies. Improved (possibly international) regulatory measures are needed to avert possible destabilizing effects on financial markets of the operations of large pension funds and to prevent the income security of older persons from being jeopardized.* (United Nations 2007*)*

The importance of the equity objective

In the tradition of Barr, pension policy is fundamentally a mechanism to facilitate a sharing of current output among the economically active and the retired. Policy design implicitly reflects both distributional goals and ultimate value judgements about equity. Is individual equity to be prioritised with the notion of fairness revolving around actuarial purity? Generational equity,[5] as followers of this approach have dubbed it, implies that each generation should pay for itself and thus get its just deserts (Williamson, Watts-Roy et al. 1999). If, on the other hand, the goal is to achieve more equality between young and old, male and female, rich and poor, then communitarian or collective objectives stressing interdependence and fairness at a point in time will be dominant. This approach is less encapsulated in a single catchword than is the case for the generational equitists. Following

[5] This concept may also be referred to as intergenerational equity, see Coleman (2012) for example, but this paper uses the term to refer to point in time equity between generations.

Williamson et al (1999), terms that are likely to be used are 'intragenerational equity', and 'generational interdependence'. The term 'intergenerational equity' is used in this paper to mean fairness in experiences and living standards between the old and the young *at a point in time*.

The discourse around pension policy is likely to reflect the dominant cultural values of the particular country. Thus the proponents of privatisation of social security in the US who argue for generational equity have been influential, precisely because they tap into deeply held American mores of self-help, thrift and self-reliance (Williamson et al., 1999). In New Zealand, while a moralistic streak can also be traced back to the 19th century, the emphasis for most of the 20th century was on more communitarian and collective values. These values are reflected in a strong 'generational interdependence' endorsement of wider concepts of equity, including gender equity, poverty prevention rather than mere alleviation, and the need to allow for 'participation in and belonging to' society rather than mere subsistence living.[6]

In spite of the rise of Rogernomics from the mid-1980s, which re-activated the older emphasis on self-reliance, thrift, choice and free markets, radical proposals to reform the state pension towards more 'generational equity' have failed abysmally. The first of these attacks on the basic values underpinning the New Zealand model for pensions came in 1991 as the newly elected conservative government attempted to make the state pension a welfare benefit (St John 1992). People were expected to provide privately for themselves. The second attack came in the form of the 1997 referendum for an effective privatisation of the state pension. This was defeated by an overwhelming majority (92.8 per cent) of voters as it was clear the Retirement Saving Scheme (RSS) would have been a replacement for the state pension not a supplement to it (St John, 1999). Since 2010, a new resurgence of interest in these reforms suggests that values that still drive the US debate are as relevant to New Zealand today.

The theoretical foundations[7]

Dependency models

Much of the policy literature on the impact of ageing concentrates the so-called 'burden of dependency'. Simple models look at how the cost of the economically inactive is borne by the economically active, while sophisticated variants tease out conceptual issues associated with measurement. For instance, what does it mean to be economically inactive? How does unemployment affect dependency? How will ageing affect the 'burden'?

These models highlight the implicit distributional problem: the share of output enjoyed by the old is not available for the young. Manipulation of the parameters such as age of entitlement to a state pension, the level of pension and the indexation formula can, in theory, bring about a shift in the burden borne by the working age population. This may

[6] The Royal Commission on Social Security in New Zealand (1972) provided an important foundation to debates around equity by endorsing the concept that everyone should have enough income to be able to 'participate in and belong to' society.
[7] This section is based on chapter 7 the Economics of pensions in St John, S. (2004). Managing the risks of ageing: the role of private pensions and annuities within a comprehensive retirement policy for New Zealand. Economics Department. Auckland, University of Auckland: 268.

be deemed necessary in light of the ageing of the population; indeed many countries are adopting this approach.

The questions remain: is there a distribution of output between the old and the young that is optimal? What are the criteria of an optimal distribution? Is the optimal outcome obtainable given real world political institutions? Any investigation into improved pension design has an overarching normative dimension; implying that there may be an optimal incidence of the burden of ageing. Clearly value judgements cannot be escaped when attempting to address these issues.

For instance, a utilitarian optimum distribution is one that has as its aim the maximisation of total utility. To make this operational, interpersonal comparisons of marginal utility (MU) of income are required, necessitating cardinal measures with all the associated problems such a methodology entails as set out in Disney (1996).

Even if, in theory, an optimal outcome can be found, it is far from clear that real world decision-making rules will produce the desired result. There is no benign omniscient mastermind that can guide decisions to achieve the 'Nirvana' of welfare maximising theory even if utility was capable of being measured cardinally. Moreover, there is a strong implication that for maximum welfare a high degree of equalisation of incomes is required. Unfortunately, this has powerful effects on incentives and significant implications in terms of work and output.

Alternative value judgements about various income distributions may be based on egalitarian or Rawlsian principles. In an egalitarian approach, redistribution may be judged desirable well beyond the point at which the economic pie starts to shrink as a result of the disincentives implied by such redistribution (Atkinson & Stiglitz, 1980, p.342). This is because of the high weighting the egalitarian approach assigns to the value of equality. On the other hand, a Rawlsian approach would emphasise the position of the least well-off, and only sanction distributions that maximise the welfare of that person (Stiglitz, 2000, p.102). In such an approach it is unlikely that universal pensions such as NZS could be justified. There is no compelling reason, for example, as to why a universal payment to well-off over-65 year olds is necessary to enhance the position of the poorest, who are largely young families.

In light of the unsatisfactory resolution of many of these normative issues, much of the literature instead concentrates on a dynamic concept in which interpersonal comparisons are not needed. Individuals have a lifetime budget constraint and are assumed to choose outcomes that are preferred over time, and are hence optimal compared to other states. Unfortunately, achieving Pareto Optimality, even if real world decision-making allows this to occur,[8] does not answer the question of whether distribution between individuals and generations is in some sense 'fair'. Disney (1996, p.14) notes:

> *…by eschewing interpersonal and intergenerational welfare comparisons, economists cannot provide clear answers as to what policies are 'best' for society.*

[8] Disney (1996, p.285) also comments: "Although economists have tried to specify mechanisms (such as 'policy rules') that might sustain intertemporal optimising behaviour, no government has yet been prepared to relinquish the notional freedom associated with policy discretion and with the accommodation of interest groups".

The burden of dependency

One of the ways in which this debate is often framed is around the rising 'burden' of ageing on the working age population. There are numerous ways to conceptualise the dependency of older people but this 'burden' is often misunderstood and oversimplified. Crudely, using the model discussed above illustrated by Figure 1, access to resources by the old is acquired by pensions, gifts and income from investment. Pensions of value *p* for each pensioner are paid for by the working age population's taxes (at cost *pD* where *D* is the size of the dependent population). Direct gifts are of average value *g* and income earned on capital stock *K* is *rK* where *r* is the rate of return.

Following Disney (1996, p.22), with average wages *w*, working age population L, and assuming the capital stock *K* is held only by the dependent population and all income and transfers received by the old are spent on output, one measure of the burden *B* of retirees on current output is given by:

$$B = \frac{(p+g)D + rK}{rK + wL} \qquad \text{equation 1}$$

If equation 1 represents a socially optimal distribution as well as the actual burden, the implication is that income from capital and gifts alone would not have sufficed.

Disney hints that forced transfers, *pD*, may provoke intergenerational conflict. In practice, if workers are compelled to pay taxes to fund pensions, they will feel their utility is not maximised and may retaliate by cutting back on gifts. Not discussed by Disney is the possibility of bequests or transfers from the dependents to workers. If pensioners do not find their pensions and voluntary transfers from workers satisfactory, they are likely to draw down their past savings, at least to the extent that they have assets, and to the extent that mechanisms exist for them to realise those assets. The net result is one of lowered bequests and changes in asset prices, which effectively reduce the potential consumption of workers, regardless of whether they or not approve.

One of the conceptual problems therefore not incorporated into this simple model is the notion of expectations of rights to a certain level of consumption by the old. This expectation is likely to reflect each cohort's experience. It is likely that the excessive expectations of the baby-boom cohorts may be particularly problematic.

The 'burden' of dependents is expressed as a share of total output in equation 1. But as Disney (1996) notes there are other possible representations of the 'burden', each with its own set of measurement issues. One issue is the public burden of pensions. This is the share of pensions in total income given by:

$$B_2 = \frac{pD}{rK + wL} \qquad \text{equation 2}$$

The tax rate t on wages needed to finance the pension, is another issue, given by:

$$t = \frac{pD}{wL} \qquad \text{equation 3}$$

This shows that the replacement ratio, p/w, and the dependency ratio, D/L, are the critical variables with an ageing population.

However the dependency ratio is a crude measure, implying populations D and L are discrete and separable. Modifications can improve the realism of the so-called 'tax burden' by identifying and including factors such as participation rates, sickness and unemployment rates.

One of the most important factors driving costs is the replacement ratio p/w with many countries increasing this ratio over time and extending coverage. The combination of a rising replacement ratio and a rising dependency ratio is at the heart of concerns about the cost of the burden of ageing. Changing the dependency ratio with policies to encourage later retirement can modify the burden, as may indexation changes to lower the replacement ratio (Disney, 1996, p.27).

Disney develops this model further from the simple tax burden given in equation 3, but even so this approach oversimplifies the reality of a world where a number of other factors are likely to operate. In the case of New Zealand, these considerations include:

- NZS is paid for from general taxation not from a separate wage tax. New Zealand's income tax base is all income, not just wage income, and the Goods and Services Tax (GST) is levied on all expenditure, not just that paid out of wages and pensions.
- Income-earning assets are held by workers, as well as held by the retired.
- Tax rates are progressive, and the progression affects the tax paid by pensioners.
- The dependency ratio D/L is not immutable and is too crude. It is influenced amongst other things by retirement decisions, the availability of work for older workers and the scale and nature of unemployment among the working age population.
- To the extent that retired people are living on their assets, they will be contributing more expenditure tax (also noted in Disney 1996, p.28).

The static dependency model takes the dependency and replacement ratios as given. In practice, growth of the population and/or of productivity will alter the dependency ratio over time. The economic burden of dependency as opposed to the demographically defined measure outlined by equation 3 depends on what is happening to rates of growth in the population and labour force participation. Naturally, positive rates in either rate will lower economic dependency over time Disney (1996, p.30). The question is: can SAYG reduce the basic economic burden of pensions?

Overlapping generations models

Overlapping generations models are widely used in this debate about policies to reduce the 'burden', in particular asking whether changing the means of financing pensions can itself be helpful. These models are derived from Samuelson's seminal (1958) paper 'An exact consumption-loan model of interest with or without the social contrivance of money'. The basic assumptions of Samuelson's model of the optimal allocation of consumption within and between periods are that:

- no goods can be stored: ie. capital accumulation is equal to zero;
- claims on consumption are discounted at a parametric interest rate (i);
- plans don't change and;
- each generation has the same preferences.

Worryingly for women who look for their reality in these models there is no role for the work of caregiving and child rearing. As one protagonist of the Samuelson model puts it 'Reproduction is exogenous and occurs through parthenogenesis' (Buiter, 1997, p.607). One might add, that magically the sick child is cured, the family fed, the social activities of multiple generations catered for.

The critical insight provided by Samuelson is that a 'social contract' between generations, whereby present workers finance the pensions of retirees in the belief that the social security system will treat them similarly on retirement, may achieve the desired equilibrium as long as the interest rate equals the population growth rate.

The contract however is threatened if the rate of population growth is falling or stagnant. In such a case some generations will have to accept a lower, even negative rate of return on their contributions or may force unsustainable pension commitments. Public choice theory suggests that each generation will always try to pass excess commitments on to the next generation. Indeed the evidence suggests that this has happened in PAYG social security systems as populations have aged, giving rise to the view that such schemes are in essence 'Ponzi' schemes.

Much of the literature since Samuelson has attempted to address the limitations of the standard overlapping-generations model. For example, the legacy of assumptions inherited from Samuelson of consistent life time preferences (no myopia); no changes in output (constant productivity) and no storable output (zero capital stock) are discussed in Disney (1996, p.41-50).

Aaron builds on Samuelson's observations and concludes that

> *…social insurance can increase the welfare of each person if the sum of the rates of growth of population and real wages exceeds the rate of interest (Aaron 1966 cited in Disney, 1996, p.43).*

The social contract works for PAYG so long as each generation is larger than the preceding one. Thus workers are better off with unfunded PAYG schemes rather than a fully pre-funded scheme "...so long as the return on social security is at least equal to the sum of population growth and real productivity growth rates" (Disney, 1996, p.50).

The conclusion drawn from this relatively simple model is that only if the real rate of interest exceeds the sum of the population and wage growth, will a fully pre-funded pension system be preferable to a PAYG one. Critically even this caveat ignores the transitional costs of a change to a pre-funded scheme (Barr, 2001, p118-121). It also may conflate the real rate of interest with the return on productive investment: savers can earn high returns from speculative investment for example.

World Bank model

Based on the Samuelson model, it appears that PAYG financing is relatively more costly than pre-funded approaches under certain assumptions about interest rate and wage increases. Following this approach, the World Bank (1994) strongly suggested that countries review their generous PAYG public schemes and adopt a three pillar approach, with a second pillar of mandatory saving managed by the private sector. Developing countries, after establishing a minimum Pillar I to meet the poverty objective, were urged to also mandate a private saving scheme for Pillar II, with a possible link between the two provided by an income test.

In an economy that is dynamically efficient, r should be greater than or equal to growth of GDP (which in turn reflects the increase in wages and population growth). Thus the World Bank (1994) claims that full pre-funding will be at least as cost-efficient as PAYG and possibly more, also conceding however that :

> *If the interest rate is lower than wage growth plus population growth, the cost advantage lies with pay-as-you-go.* World Bank 1994, p 299)

Feldstein[9], another influential voice in the call to privatise pensions, stresses the efficiency or deadweight costs of the extra tax burden implied by ageing under the US PAYG social security scheme (Feldstein & Liebman, 2001). He reviewed the impact on national saving and concluded reforms are likely to have a positive impact. But the issue is controversial and the literature far from conclusive.

Critiques of the World Bank model

The framework and the conclusions the World Bank reached in the 1994 study are vulnerable on several grounds, especially if relevance is sought in the context of the New Zealand pensions system. Internationally, the World Bank prescription provoked a number of critical reviews (for example Orszag and Stiglitz 2001).

World Bank's analysis of PAYG versus fully pre-funded pensions has little analysis of macro impacts, nor of the inevitable transition costs in a shift from PAYG to a pre-funded pension scheme. PAYG and pre-funded schemes are doing two different things. One cannot replace the other, or be taken out of context, unless the argument is about what should have been the case a long time ago when pension systems were first introduced. A PAYG scheme improves the utility of existing retirees at the time of its introduction, while a pre-funded scheme does not. There may be social equity and justice reasons, as there were in the 1970s in New Zealand, for improving the incomes of the retired. Clearly, the issue of whether this was a good thing or not is highly normative.

Orszag and Stiglitz (2001) identified ten myths surrounding the common interpretations of the World Bank's preferred approach. The macroeconomic myths they identify surround the mandatory private saving second pillar are:

- individual accounts raise national saving;
- rates of return are higher under individual accounts;
- declining rates of return on PAYG schemes reflect fundamental problems and;
- investment of public trust funds in equities has no macroeconomic effects.

They caution against thinking that there is one single answer for all countries and conclude, after examining these and the other myths that:

> *…the debate over pension reform would benefit substantially from a more expansive view of the optimal second pillar, which should incorporate well-designed, funded, public defined benefit plans. Such a more expansive perspective would allow policy-makers to weigh appropriately all the trade-offs they face, including private versus public systems; prefunding versus not prefunding; diversifying versus not diversifying*

[9] Feldstein has become somewhat discredited as the initiator of the financial deregulation that led to the housing bubble and securitization of the mortgage industry in the US. Feldstein failed to see the dangers of unregulated financial derivatives or financial-industry compensation which may call into question his understanding of the terms 'risk' and 'return'

and defined contribution versus defined benefit pension plans. (P. Orszag & Stiglitz, 2001, abstract)

Barr (2000) explodes similar 'myths' in the pension debate. In particular he writes of the primacy of the need for good governance and that "…from an economic perspective the difference between PAYG and funding is second order, and the range of potential choice over pension design is wide" (Barr, 2000, p1).

Impact on saving

Many arguments for preferring pre-funded second pillar schemes come from presumptions about the impact on various savings measures (Orszag and Stiglitz 2001). While the theoretical case can be made for funding increasing national saving, the empirical evidence is far less obvious. Hemming (1998) provides a useful overview of the vast literature on this issue. He claims that the case for a switch to funded schemes is far from convincing, and refutes the claim that funded schemes are superior in handling demographic and economic risk. Eddy and Gower (2000, p22) provided some evidence for Australia, where the introduction of the Superannuation Guarantee (SG) scheme might have been expected to increase private and national saving. They note that the expansion of compulsory superannuation in the last fifteen years of the 20th century did not result in a discernible lift in aggregate private saving, due at least in part to displacement of other kinds of saving.

More recently, research shows suggests that the SG scheme has encouraged older Australians to incur more debt. Overall, these enforced savings, locked up until a person retires have been largely offset by similar if not larger private borrowings. The government subsidises private saving with expensive tax concessions without achieving saving on the age pension:

> *After two decades of saving, Australians now have $1.5 trillion in superannuation savings. However, the growth in superannuation has been matched by households taking on an equivalent amount of personal debt. Households have effectively offset the superannuation savings with increased levels of personal debt. (KELLYresearch 2012)*

It is often claimed that the introduction of PAYG schemes reduced national saving. Despite the logic of the argument, the empirical evidence is far from convincing (World Bank 2004 p 307-310). The reasons why the facts don't fit the theory include the desire of the older generation to leave larger bequests (maybe in recognition of the higher taxes that the young are paying or will have to pay in the future); offsetting changes in transfers from children to their parents; and that higher earners may not have faith they will get pensions and thus save anyway.

The World Bank did argue, however, that the introduction of full pre-funding was likely to have a beneficial effect on saving. Among the explanations is the 'recognition effect' whereby the compulsory scheme raises the awareness of the importance of saving. The theory in this case is somewhat supported by empirical evidence (World Bank, 1994, p.209), Nevertheless, the World Bank wisely concluded:

> *...if the policy goal is to increase saving, pension policy needs to be accompanied by other measures - for example, keeping inflation under control, increasing the availability of safe instruments for saving, discouraging consumer borrowing, and*

possibly providing tax incentives to long-term savings such as taxing real rather than nominal returns. (World Bank 1994, p.309)

The transition from PAYG to full pre-funding, a painful one for the current working generation, was largely ignored in the 1994 World Bank report. As Orszag and Stiglitz (2001) and Barr (2001) claim, ignoring the administrative and transition costs makes simple rate of return comparisons misleading. Transfers will still need to be made to the existing retired population (for example for social equity and justice reasons), and this could be interpreted to mean that the current generation of workers must 'pay twice', as they are forced to fund their own pensions as well.

In the case of the compulsory Retirement Saving Scheme (RSS) proposed for New Zealand in 1997 (St John 1999; St John 2001), offsetting tax changes were required so that workers could afford to pay their contributions. These tax reductions would have meant higher taxes elsewhere, lower government spending or lower total public saving. In this New Zealand experience, the conclusion that introducing a pre-funded scheme averts an increase in required contribution rates arises only in the absence of macroeconomic considerations in the analysis.[10]

Once the baby-boom generation draw down their funds in retirement, the saving deficit will still need to be filled either by increased taxes or more saving. This could mean either higher contributions paid by workers to reduce consumption or higher public surpluses. Either way the burden on the current workers is not alleviated.

Rate of return arguments

Inescapably, the ultimate selection of a theoretical approach involves value judgements about equity objectives as previously discussed. Pensions have a range of possible objectives, one is fairness based on actuarial purity, another is redistribution to allow for participation and belonging or poverty prevention, another is income smoothing over time, yet another is to increase national savings and improve growth.

A critical preoccupation of the literature has been with how PAYG schemes redistribute across generations. The traditional way to determine net redistribution is to look at the expected present value of benefits less the present value of contributions for each generation and from that work out a rate of return. Negative redistribution is implied by a rate of return less than the market rate of interest. This is often accompanied by the implication that alternative investments would make the investor better off. Usually net rates of return are calculated for groups of people, cohorts, males, females, etc., and show the first generations under a PAYG scheme are advantaged compared to subsequent ones, with little redistribution from rich to poor within generations.

The better-off enter the workforce later, and pay contributions later. They may gain from the ceiling on contributions and they live longer in retirement and enjoy earnings-related pensions longer. Also there is very often a significant redistribution to women at home in the social security formula for pensions. In the US there is a 50 per cent bonus on pension for a spouse with a wife who was not in the paid labour force. Most often, the spouse of a poor person must work outside the home so that it is the wealthy who can afford stay-at-home wives are rewarded in the public pension system.

[10] Similarly the push to introduce individual accounts in the social security trust fund in the US is based on a misunderstanding of the overall macroeconomic impact as opposed to how the accounting looks. The key point is that there is no free lunch (P. Orszag, 2001).

Rates of return discussions are frequently obscure with few writers spelling out clearly exactly what they mean. Following Settergren and Mikula,(2001) Table 1 sets up a simple overlapping-generations model in which the average wage, w, is assumed to grow at ω per annum, in a steady state population. There are assumed to be three identical individuals in each period alive who each live three periods of equal length, working in two of these and retired in the third, when they each get 0.5w as a pension. The PAYG scheme is funded by a 0.25 payroll tax. Table 1 illustrates this situation. If the PAYG scheme is introduced in period 1, the oldest, individual 12, reaps where he[11] has not sown with a full pension from the younger individuals, 10 and 11. Individual 11 also does well and enjoys a high rate of return, as he has contributed only 0.25w but receives a full 0.5w pension for the second year.

Table 1: Rates of return with improved longevity

Period	Payment to the PAYG scheme	Payment to the PAYG scheme	Pension received	Pension received
1	Individual 10 $0.25w_1$	Individual 11 $0.25w_1$	Individual 12 $0.5w_1$	
2	Individual 9 $0.25w_2$	Individual 10 $0.25w_2$	Individual 11 $0.5w_2$	
3	Individual 8 $0.25w_3$	Individual 9 $0.25w_3$	Individual 10 $0.5w_3$	
4	Individual 7 $0.5w_4$	Individual 8 $0.5w_4$	Individual 9 $0.5w_4$	Individual 10 $0.5w_4$
5	Individual 6 $0.5w_5$	Individual 7 $0.5w_5$	Individual 8 $0.5w_5$	Individual 9 $0.5w_5$
6	Individual 5 $0.5w_6$	Individual 6 $0.5w_6$	Individual 7 $0.5w_6$	Individual 8 $0.5w_6$
7	Individual 4 $0.5w_7$	Individual 5 $0.5w_7$	Individual 6 $0.5w_7$	Individual 7 $0.5w_7$

Source: based on ideas of Settergren and Mikula (2001)

If there is a one-off improvement in longevity in period four, while the pension stays at 0.5, the rate of return of individual 10 improves dramatically. Not until we reach period 7 do the rates of return stabilise, so that individual 7 has fully contributed during his working life. His effective rate of return is ω.

But what is the reality of individual 10's apparent high rate of return? He has had to live an extra period and his average discounted living standard in retirement does not improve. He may have money in the second period of retirement, but he is no better off than he was in the first period of retirement, he has just lived longer. The unrecognised issue in the traditional rates of return literature is that *it is relative living standards that are important, not rates of return.*

In period 4, individuals 7 and 8 pay an extra 0.25 per cent payroll tax. They have gained from wage growth compared to individuals 9 and 10, but that gain is offset by the impost of the extra 0.25 wage tax.

Living standards of workers in period three were based on 0.75 w1 $(1+\omega)^2$. In period four, workers' living standards fall to 0.5 w1 $(1+\omega)^3$. If there is no growth at all, $\omega=0$

[11] The male pronoun is used advisedly.

then this is a fall in living standards of 33 per cent. To compensate, the rate of increase in wage ω needs to be 50 per cent.

This extreme example is instructive in showing that a one-off increase in the period spent in retirement of 100 per cent requires a 50 per cent annual rise in wages to maintain living standards in the model. If longevity is improving more slowly than wage increases or productivity, then living standards may be maintained for workers as well as the retired and may even rise.

It might be concluded faced with the prospect of living longer individuals should save more for themselves. If in period 4 the new payroll tax of 0.25w is put aside in private accounts of individuals 7 and 8 to fund their extra period in retirement, somehow additional taxes will still have to be raised to pay for individual 10 in his second period of retirement, if he is to be supported at all. The transitional generation have to pay twice. The problem is worse if there is a complete shift to SAYG, so that the full 0.5w is required to be set aside to achieve a funded pension.

Abstracting from the transition period, if say, in period 8, individual 5 and 6 have fully saved for themselves, then clearly to be as well off as under PAYG, their saving must grow at least as fast wages. It is tempting therefore to then claim that if the real interest rate is equal or more than the rate of growth of the economy, SAYG is better than PAYG.

Discussion

While these models are helpful in understanding where some of the statements in the literature come from we do not live in a world where *any* of the assumptions hold. Notably:

- Individuals are not identical. Workers have a spread of earnings around the average wage, and hours of work and years employed vary significantly within and between generations.
- The use of the masculine pronoun is appropriate as these models are somewhat irrelevant for women. They take no account of the work of reproduction or caregiving or the separate needs of women in retirement including their greater average longevity.
- Individuals do not all live the same period of time in retirement but have a distribution of probability of death around the average.
- Relative living standards matter, not rates of return.

Clearly we need to take into account a greater spectrum of experience than may be possible while keeping the model tractable. For example, a more accurate picture can be drawn by distinguishing four distinct classes, i.e. those with:

- Low average earnings while in periods one and two, low longevity (many lower socio economic men and women).
- Low average earnings while in periods one and two, high longevity (many women).
- High average earnings while in periods one and two, low longevity (bad luck).
- High average earnings while in periods one and two, high longevity (many men).

In contrast rates of return studies generalise for all 'workers' and mask what is really going on. The World Bank study, for example, reports rates of return were higher than 15 per cent for workers retiring in the 1950s and 1960s, 8 per cent for those retiring in the 1970s

but only about 2 per cent for workers retiring after 2000. Significantly, the inference is that these rates were less than these workers could have got from other investments (World Bank, 1994, p.134).

There is a strong sense of a lack of actuarial fairness:

> *In the Netherlands, Sweden and the United States, workers retiring in the first thirty years of the public pension scheme received large positive lifetime transfers, whereas many workers retiring in the future will get less than they would from other investments and will suffer negative lifetime transfers. (World Bank, 1994, p.2)*

The observed fall in rates of return largely arise from three sources:

- The high rates to the first generations reflect their less-than-full contributions.
- The change in demographics.
- Policy changes which diminish generosity, such as raising the age of eligibility and changes to the indexation formulae.

The particular formula used to determine the final pension under different PAYG social security schemes determines the rates of return for each of the different groups identified above. Those with high average earnings while in periods one and two, and high longevity will generally do much better than those with low earnings and low longevity. The favoured group will be largely high-earner, long-lived men and their spouses. Ironically it is this group with the most to gain from privatisation of the PAYG system, while the losers will be those who live a long time and have a low lifetime earnings history (a group in which women are disproportionately represented).

In the case of New Zealand, the rates of return analysis is not readily applicable. The source of revenue for financing NZS is not only tax on wages, but includes taxes on investment earnings and taxes on expenditure including those paid by the retired themselves. The basis for entitlement to the universal flat-rate pension in New Zealand is not contributions, as in social insurance PAYG schemes, but the simple one of residency. Therefore relating tax contributions to pensions paid is not just difficult, but conceptually meaningless especially for those who have never been in the paid workforce or even paid income tax.

The first generation of retirees who received 'National Superannuation', as the state pension was then called, certainly received a boost in their living standards. Looking back, the portion of taxes paid by many recipients for social security would have been relatively miniscule. Yet, they can be viewed as being compensated for the sacrifices and taxes that they paid to build New Zealand's infrastructure and bring the country successfully through the depression and war years.

The costs of pre-funded pensions

The World Bank and other similar models, in concluding that the shift to full pre-funded arrangements is optimal, specifically assume that actuarial equivalent pensions will be paid once private funds have been accumulated, thus they fail to account for real world market failure problems in private annuity markets (St John 2009). The pensions paid from pre-funded private schemes compared to pensions from a New Zealand style public PAYG scheme will always be at a disadvantage:

- They will incur much higher administration costs and overheads including the need to generate a profit.
- If there is unanticipated wage growth, or inflation, or risky investments that collapse[12], pre-funded schemes will find it difficult or impossible to meet expectations (for example of wage-related, real pensions).
- Uncertainties around investment and longevity risk make it expensive for annuity providers.
- The macro implications of the transitional period may require offsetting policy changes, such as offsetting tax cuts to pay for increased contributions as in the 1997 Retirement Saving Scheme, (RSS).[13]
- There is likely to be pressure for all or part of the private pension to be inherited on death, reducing the ability of the scheme to spread the risks from those who live a short time in retirement to those who live the longest, (see, for example, the debate over the RSS in New Zealand (St John, 1999, 2001)).
- The distributional implications are in the direction of more, not less inequality, as there is a close link between contributions and benefits. This link may or may not lead to less tax evasion than under a PAYG scheme.
- The recognition of unpaid work is impossible without a government contribution (unpaid work recognition is implicit and fundamental to the existing New Zealand public pension system).

The assumption therefore of a costless annuitisation process that could approximate the pensions from a PAYG scheme is not justified. If the aim is to save costs by reducing total pensioner claims, then privatisation may be a way to do it, but the same ends might be more simply and less expensively achieved by parametric changes to the PAYG system itself (see for example St John 2012).

Protection from demographic risk

The argument that a PAYG pension backed by a social contract is less secure than a pension scheme with asset-backing is a seductive one and underpins much popular anxiety about the need for pre-funded pensions. Thus it is thought that while a future generation might refuse to pay social security contributions under the social contract, pensioners' assets in a funded scheme would be inviolate. But the reality is that the cost of pensions and the burden on workers is determined by the pensions that have to be paid out and not by the way in which they are financed. Under the ageing scenario, a smaller working age population must reduce its consumption if a larger retired population is to consume more.

Under PAYG, the per capita demands of the retired can be reduced if workers refuse to pay higher taxes or contributions. But under a pre-funded scheme a similar effect is possible. Workers may force employers to pay them higher wages, reducing profits and dividends. If the proportionately fewer workers are only persuaded to purchase assets from the 'Fund' at depreciated prices, pensioners' expectations from the pre-funded scheme will not be met. The perception of what is happening might, in this latter case, be less clear:

[12] As notably occurred in the Global Financial Crisis of 2008.

[13] A shift to personal accounts does not diminish the burden on workers as they will have to honour the unfunded commitments to existing and future retirees. The argument that the issuance of special recognition bonds etc overcomes this problem as outlined by Feldstein (2001) is fallacious (Mitchell, 2001, p.4).

…both PAYG and funding are exposed to demographic risk, and in both cases this risk will ultimately be born by pensioners. However the extent that this burden is more explicit with PAYG - and there is an obvious sense in which this is so - then the potential for intergenerational conflict may be greater than with funding. (Hemming, 1998, p.12)

What is to be learned from the theoretical approaches?

In summary, the overlapping generations models reviewed here are highly simplistic and based on restrictive assumptions. They are also inconclusive and while based on simplifying assumptions they quickly become too complex to be of much use for informing real world policy decisions. Furthermore, if they are to be calibrated to a real world economy there are daunting data requirements. The degree of implicit, but controversial, normative judgements in these models and their failure to incorporate gender analysis also render them less useful to real world policy-making. As Disney (1996, p.49) notes:

Whether such equilibria are attainable when, for example, capital investment is driven by other autonomous factors is open to doubt … and the analysis of disequilibria and stability properties can get extremely complex.

One of the major problems of changing to a funded scheme from PAYG is the double burden on the current generation. The simplistic recommendation to adopt full pre-funding of social security ignores this transitional cost. The size of the transitional cost, however, is real and must be offset against any discounted gains from such a shift (Barr and Diamond 2008 p107). Once this is done, it is far from clear that recommendations to privatise social security can be justified. As discussed below advocates of SAYG in New Zealand rationalise the double impost by appeal to equity arguments.

Moreover, as discussed, the case for funding over PAYG on the grounds of improved national saving is far from clear on empirical evidence despite its theoretical appeal and advocacy by the World Bank.

If funding is a lower cost financing option than PAYG, if it results in more intergenerational fairness, if it can better handle demographic and economic risk, if it can more clearly signal future pension costs and if it is associated with high saving (or at least most of these things are true), then a case could be made for funding. However it is argued that funding does not have a clear advantage on these grounds, and the case for a shift from PAYG to funding is an uneasy one. (Hemming, 1998, p.5)

In the New Zealand context it is clear that it is difficult to fit a social insurance scheme such as NZS into the context of the overlapping generations model and the related discourse about rates of return. This does not, however, prevent analysts from attempting to do so. At a one day symposium on Retirement Income Policy (Wellington July 13, 2001), Professor John Rust was invited to present the opening paper in which he stated:

Economic theory suggests PAYG social security systems result in a) lower savings, b) higher costs and distortions relative to fully funded systems since the implicit return of PAYG (the sum of real wage growth plus population growth, approximately 2 per cent for New Zealand) is less than the real interest rate (5-7 per cent).

The high real rate of interest in New Zealand likely to be related to the risk premium needed to attract international capital to pay for an imbalance in the external accounts and a monetary policy focused on keeping inflation low. It does not necessarily reflect

genuine growth opportunities, suggesting caution is needed when drawing such conclusions.

Rust (2001) reported that the internal rate of return for average wage earners in the US from social security was only 2 per cent. He claimed it was even negative for high earners.[14] The clear inference was that people could do better investing on their own. Moreover in drawing conclusions for New Zealand he stated:

> *To the extent prefunding comes from increased tax contributions (as opposed to borrowing to prefund the pension liabilities) New Zealand will benefit from the higher compound returns on the trust fund portfolio as opposed to the less than 2 per cent rate of return on a PAYG system.*

But, as observed above, it makes no sense to talk about a rate of return in New Zealand's PAYG scheme.[15] Naturally, pre-funding the state pension has an opportunity cost of other uses of the funds, such as repaying public debt or reducing taxes. Rust (2001) argued that individual accounts would be legally the individual's own property making it difficult for government to renege on its promises. But government can affect the outcome in many ways, such as in tax provisions. While in a supplementary scheme that tops up the basic pension individual accounts are critical, one of the advantages of the New Zealand approach, apart from its simplicity, is that there is no residual value to be appropriated to an estate in the case of death, and there are no messy issues around spousal pensions and divorce. It is a highly cost-effective scheme if judged, not against the goal of actuarial purity, but of securing a reasonable standard of living for all older people.

While the extent of the international economics literature is impressive, the results from a policy perspective must be judged largely inconclusive. Debates over pre-funding versus PAYG, defined benefit versus defined contribution, private versus public delivery, have not delivered clear answers. As Banks and Emmerson (2000, p.55) suggest, further academic research and model refinements are now showing 'diminishing returns to scale' and now the hard work of normative analysis is needed:

> *Ultimately, however, conditional on policy-makers' knowledge of pensions issues being at the frontier, many developed countries are at the point where value judgements need to be made in order to set the direction for policy on future public and private pensions.*

Furthermore, an enquiry into welfare enhancing pension reform cannot avoid distributional value judgements. If our interest is improving retirement policies, what concepts of equity should be used? This paper has suggested that the models that stress actuarial fairness for all generations, or those that are based on concepts of 'generational equity', are not useful as a guide to New Zealand policy development. The concepts of generational interdependence and intergenerational and intragenerational equity are more appropriate.

[14] This is not true for single-earner couples in the US, due to the 50 per cent pensions bonus for the spouse. The widow also continues with her husband's pension.

[15] To reiterate, New Zealand Superannuation is highly redistributive, making the average rate of return an unhelpful concept. Those who pay no tax during their pre-retirement years can gain the equivalent in pension of several hundreds of thousands of dollars. The New Zealand system is not analogous to the US system.

The recent SAYG and PAYG debate in New Zealand.

It is fair to say that academic debate and the influence of economic models of the type described here has been muted in New Zealand, that is, until the Coleman papers emerged (Coleman 2011; Coleman 2012; Coleman 2013).

Largely the Coleman papers reflect an uncritical acceptance of the implications of using theoretical models for policy purposes. The various papers offer policies that range from an enthusiastic advocacy for individual accounts, to a more limited shift from PAYG to SAYG in the NZSF just to pay for the expansion of NZS projected with the ageing of the population.

The argument, common to all papers, is that we are living longer and therefore we will get NZS for longer. However, we haven't paid as much as we expect the next generation to pay and therefore this is unfair. The view of intergenerational equity is thus quite specifically that each generation should pay for themselves. This view allows the rationalisation of the double burden of the shift to SAYG while it disguises the huge variability of experiences within generations with respect to longevity and work experience. It also ignores the importance of inter-dependence of the generations.

The alternative normative intergenerational equity judgement argued in this paper is to require, at each point in time, a fair sharing between all New Zealanders who are alive, regardless of how little or how long they have lived. Thus what could be deemed 'unfair' in the face of multiple economic problems such as child poverty and growing inequality is successful and rich people getting a full NZS while still working.

An earlier paper by Coleman informed a major report in 2012 from the Financial Services Council. This report claims it has a "New plan to keep NZ Super, continue retirement at 65 and double retirement incomes" (Financial Services Council 2012). The idea is for increased SAYG contributions to KiwiSaver used to fund the first eight years of retirement. If there is insufficient saving in a person's account then the government would top up the funds to give a pension equal to NZS. The age of eligibility would shift out gradually as longevity increases.

Underpinning these SAYG reforms is the belief that a shift to more SAYG would mean we can have bigger pensions and lower taxes in the future. Table 2 summarises the proposal called KiwiSaver Plus.

TABLE 2

Source:(Financial Services Council 2012 p 32)

SECTION 10 *What could KiwiSaver Plus look like?*

KiwiSaver Plus is designed to do several things:

- Ensure every New Zealander can have a secure income in retirement without means or asset testing.
- Maintain the option for New Zealanders to retire at 65.
- Enable a majority of New Zealand's future retirees to achieve a comfortable income in retirement around two times the level of NZS.
- Help to reduce the pensions gap with Australia.
- Assist New Zealanders with their long-term savings to fund retirement, or investment in a first home, business, farm or tertiary education.
- Enable members to take their self-funded pension anywhere they wish in the world.
- Give members the option to defer their retirement and receive a bigger income by doing so.
- Preserve all the current NZS entitlements of those New Zealanders in or close to retirement.
- Give members the option to manage their own retirement investments.
- Ensure that no scheme member or their family is vulnerable if death, sickness or disability suddenly prevents them from earning an income.
- Ensure no person's retirement account balance will fall in value below what has been originally invested.

Our analysis indicates that the first nine of these objectives could be achieved by having contributions equal to 10% of incomes, whereas adding the last two features would require a further two per cent of income in contributions bringing the total to 12%.

The KiwiSaver Plus scheme outlined below builds on the best features of NZS and KiwiSaver while ensuring they work together to create a more secure retirement income for all participants.

The Coleman thesis is based on the assumption that the rate of return to SAYG is greater than the growth of economy. This confuses the return to capital with return to saving and commits the fallacy of composition. Thus if everyone saves more but the size of GDP is no bigger there will be more claims on fixed output. This will be shared out through either inflation, the collapse of saving schemes and finance companies, or wage rises, or some combination of these. And, why would GDP be bigger? The 'Bigger Pie' argument is:

- SAYG gives more aggregate saving (but offsets are very important).
- SAYG saving is all is *invested* in the *economic* sense. (The purchase of Mighty River Power shares through privatisation of the state asset is not an investment that makes the economy grow).
- The investment is *productive:* (but societies are littered with investments that become white elephants; non-productive and have excess capacity. For instance, post Rugby World Cup, many retail shops folded and small businesses collapsed).

If the SAYG hypothesis is right, that this system will deliver a bigger, more useful pie to share around, then *why are we not investing already? Why does the case for more productive investment today require that we tie it to retirement pensions?*

Expanding private SAYGO KiwiSaver schemes may have some real drawbacks (and be not fit for purpose):

- The type of 'investment' managed funds do has *very little* to do with expanding the productive base of the economy.
- They will expand the role of the financial sector in the economy. This is already a large contributor to the GDP. Is that the right kind of growth? Do we have a regulatory regime that is robust enough?

- They may be a distraction from asking the important questions such as what kind of *real investment* do we need for an ageing population? (for example, transport infrastructure, water, healthcare, housing, more nurses, more investment in our young children).

There is little disagreement on the point that the baby boomer generation has been and will be favorably treated (like individuals 10, 9, and 8 in Table 1). However this leads to an argument for expecting a *higher contribution* from them, not the hard-pressed generation that follows, (ie individuals 8, 7 and 6), to fund necessary investment around climate control and rebuild of Christchurch as well as all other pressing social expenditures. These decisions do not need to be *tied to saving for retirement.*

Using KiwiSaver to fund the first eight years has major drawbacks: people need a secure additional income stream from savings for their life, especially in the last years (St John, Dale et al. 2012). If all KiwiSaver is used up for the first eight years, there is no supplementary income to support the next 10-20 years.

The classic assumptions are that each person is identical, works for 45 years at the average wage to age 65 and lives an average of 19 years after that (Coleman 2012). Women carry the bulk of child-bearing and rearing responsibilities and do not fit this standard picture. As women live longer on average they are worst affected but typically the Coleman papers contain no gender analysis. Most will require a top-up of KiwiSaver to provide the pension for the first eight years so that KiwiSaver saving for many women will be rendered essentially meaningless. Even if the offset is 50% rather than 100% there is an effective additional tax on what should be a tax-paid lump-sum under the TTE[16] arrangements in New Zealand. Those who accumulate wealth in other ways, however remain unaffected.

The latest solution Coleman has discussed is simply to expand the NSZ fund. Thus the April 2013 paper outlines:

> *..the case for expanding New Zealand Superannuation on a PAYG or a SAYG funding basis, assuming that a SAYG-funded expansion uses the New Zealand Superannuation Fund to accumulate assets. The paper argues that a SAYG funded expansion of New Zealand Superannuation would result in smaller intergenerational transfers to current generations from future generations, lower long run taxes, and a greater accumulation of wealth than a PAYG-funded expansion. The size of the effects is considerable. It is plausible that the tax increases needed to fund an expansion of New Zealand Superannuation on a PAYG basis are twice as large as those required to fund it on a SAYG basis. (Coleman, 2013, p3).*

The idea is that this is used to support early retirement at ages 65-73. However, while this may appear to overcome the problems for those who may earn less (eg women) this raises the same issues of unfairness. While Coleman argues this is not unfair to women because everyone gets the same NZS the fact remains that those who otherwise would expect their saving to supplement NZS have less because they pay higher taxes to fund the contributions to the NZSF, while others can still retain all their other forms of wealth and saving.

[16] Contributions taxed, earnings taxed and capital lumpsum tax free akin to the tax treatment of a bank deposit.

Conclusion

The case for New Zealand to fundamentally alter its retirement policies, by shifting to full pre-funding away from PAYG arrangements as proposed by the World Bank, cannot be sustained by rate of return arguments or by generational equity arguments. There are also concerns if the shift is limited to paying for future increase costs of NZS, or used to fund the first 8 years of retirement.

The aim of policy for the retired should be to facilitate a fair sharing of resources both between young and old and amongst the old themselves. This suggests parametric changes to the state pension and reforms to private voluntary savings arrangements are required. Reforms must meet agreed criteria, for example those of equity, efficiency and administrative simplicity. To be sustainable, they should also be flexible in the light of uncertainties surrounding migration flows and economic conditions. The achievements should be empirically evaluated, suggesting the need for comprehensive data on distribution and living standards.

The case for more SAYG itself appears to flounder on two grounds: First the economic one that it is going to make the economy grow faster. This is based on the assumption that r> ω ie that returns to investment exceed the real rate of growth of the economy. In fact people's saving will be invested in all kinds of ways, not all productive, but often speculative and volatile.

Second the normative aspect: Coleman believes that each generation/cohort can and should pay for themselves. The alternative normative stance requires that currently produced annual output of useful things is shared equitably between all New Zealanders who are alive *regardless* of how little or long they have lived or might live. Pension policy should ensure older people get a fair share of output and PAYG is an efficient way to do this (for the basic amount at least). Under this stance, the focus should instead be on enabling people to translate their KiwiSaver and other savings into supplementary income streams.

While there is an argument for the wealthier baby boomers making a higher contribution today to pay for necessary infrastructure, there is no necessity to ring-fence this contribution in the NZSF. Higher taxes may be more appropriate than an expansion of any form of SAYG which tends to be regressive.

Using the context of the New Zealand economy it is not obvious that a shift now to SAYG would allow bigger pensions and lower tax in the future. For example, it is NOT at all obvious that there are lots of productive investments, just waiting for us to put more into KiwiSaver or the NZSF. Moreover, increasing saving in a recession is dangerous in a macro sense. Finally, investment does not lead automatically to growth: as Barr (2001) notes, during the last days of communism, investment rates in the centrally planned economies were high but growth was stagnant or negative. Even in well-run economies, it would be dangerous to assume that pension fund managers make more efficient choices than other agents in channelling resources into their most productive uses.

We might heed this warning:

> *Funded pensions make significant political demands on government and require significant institutional capacity in both the public and private sectors. The litany of*

> *funded schemes that have failed completely or that have not lived up to the promises that were made for them attests to the importance of these operational issues, as well as to the dangers of basing policy on untested and perhaps excessively optimistic predictions.*(Barr and Diamond 2010)

If the government wishes to increase saving it can generate surpluses and repay debt. It can also invest in productive assets on the balance sheet but with no need to put a ring around these assets and pretend they can only be used for retirement income. New Zealand might more sustainably provide for an ageing population by focusing on parametric changes to NZS today, not through forcing SAYG on those aged 20-40 and those not yet born.

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