

Redistribution and capital market impacts: principles and scope for actuarial involvement

Anthony Asher
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This paper forms part of a series of papers on the actuarial role in the balancing mechanisms of retirement systems that are intended for debate at the PBSS colloquium in June 2103. It follows, and in part responds to, Rob Brown's "The Essence of Social Security: Debunked Myths."

I attempt to make the argument that social security retirement systems (SSRS) need actuarial monitoring, and spell out the principles that should inform such involvement.

The first section identifies the problematic issues of income redistribution and the impact on capital markets as being fundamental to the management of SSRS. The next section suggests principles that may be applied to address these issues. Section three considers the redistribution implicit in DB schemes and how actuaries should play a role in making it transparent.

Redistribution in DC arrangements arises from the volatility of the underlying investments, where the main issues are investment and expense management and retirement planning. Section four suggests that even if they are not traditional roles, there is a place for more comprehensive reporting to ensure that the schemes meet their objectives.

The fifth section moves on to consider the impacts of all types of SSRS on investment markets and how these might be better evaluated and managed. There is an obvious actuarial role in the projection of the effect of demographic changes. More controversial would be the relationship of SSRS with financialisation and a potentially enhanced role for actuaries in the governance of the financial system and particularly in much more intensive data collection and analysis.

Section six then expands on the possible role of actuaries and section seven summarises and concludes.

I Actuaries and social security retirement systems

Rob argues that the essence of a SSRS is a transfer from the workers to the elderly, that many accepted opinions of the relative merits of funded systems are myths, and that the risks to which members of individual account systems are exposed make these the worst of all systems. But perhaps like Democracy, the system that seems to devolve power to relatively

incompetent individuals is the worst of all systems – except all the others that have been tried.

Before addressing this question, however, we have to consider the two main sets of issues that can interfere with the essential functions of a SSRS:

- The first is the question of how the redistribution from young to old will be effected – both within and between generations. In defined benefit funds, benefits are not necessarily distributed proportionately to contributions – whether or not allowance is made for the time value of money. As the distribution does not depend on personal consent, it requires the power of the state, and that power is always open to abuse and should be subject to appropriate oversight. In DC funds, the redistribution depends on investment choices and the random affects of market movements, creating considerable volatility that raises questions about the suitability of these schemes for providing incomes in retirement.
- The second set of issues relates to the effects of the cash flows on the economy generally and on capital markets particularly. There are potential unintended, and unrecognised, consequences.

These issues are of interest to actuaries as citizens, but members of the profession bear a personal responsibility because of their insights into the mechanics of the systems and an even greater responsibility if they are directly involved in management or oversight. Moreover, the IAA itself, and in many countries the actuarial professional bodies, recognise their responsibility for the public interest. Professional responsibility goes beyond the scope of our principals' instructions: from Hippocrates onward, it has required that we are sure that we "do no harm".

The issues at stake are not just technical. Vast amounts of money are at stake in SSRS. Franco et al (2012) record that they absorb over 20% of GDP in the European countries they investigate. They report different estimates of the present values of these liabilities as multiples of GDP. It is difficult to approach discussion of such large amounts dispassionately, even more so as everyone is personally affected financially in one way or another.

However complex and politically fraught, it can be argued that it just the standard actuarial problem writ large on a national scale. Balancing inflows with outflows, and allocating costs and the benefits equitably, is fundamental to all insurance and retirement schemes. Where the arrangements are subject to the discipline of a competitive market, questions of equity can be replaced by those of economic viability but in both cases the use of the actuarial toolkit is invaluable.

The role of actuaries is to develop and implement the techniques required to manage financial security systems. We identify and measure the key driving influences and project them as best we can.

II Redistribution and justice

Redistribution is a zero sum game and different parties are likely to defend, or seek to extend, their shares whether or not they are justified. In arguing their position, they may appeal to the need for greater equality, more efficiency, a focus on the poorest or for a closer relationship between the value of contributions and benefits (which the economists often call “actuarial equity” – a term that I shall use here). I suggest that reconciling these legitimate but conflicting objectives, is a function of the principle of justice (or equity). I make a more detailed defence of its application to social security systems in Asher (2010). In essence, it seems to me that justice requires a balancing of different criteria, which in the context of SSRS are:

- *Equality* of treatment, horizontally in that people with the same characteristics should be treated the same, and vertically in the treatment of people with different characteristics should be proportional to their differences. Equality of outcomes is desirable because all people are equal.
- Peoples *needs* for poverty relief or insurance against longevity risks should be considered
- Schemes should be *actuarially equitable*. People who have contributed more have a real claim to higher benefits based on realistic assumptions and fair interest rates.
- Governments should *not interfere* without good cause in any aspect of their citizens’ lives, and so compulsory membership of retirement systems needs good justification. Not only should individuals be given as much liberty as possible, the accompanying principle of subsidiarity is that power should be devolved to the lowest local level consistent with meeting the system’s objectives.
- Considerations of *efficiency* are also valid.

Actuaries are not experts in questions of justice or redistribution, and it seems to me that there is a good argument for arguing that these are democratic choices. The professional experts in this field (philosophers and lawyers for instance) are less concerned about precise outcomes but more about the justice of the process and the need to consider the full range of stakeholders and criteria. Actuaries can however use their understanding of the mechanics of the industry to inform public debate, and as members of the public are entitled to participate (as long as their personal interests are identified and disclosed).

Williams (1997) provides a warning:

“There is a regrettable tendency for equity arguments to be conducted within a rhetorical framework in which it appears possible to ‘do good’ at no opportunity cost whatever. It generates a great deal of righteous self-satisfaction for the romantic escapists and it puts economists back in the role of the dismal scientists always stressing the sacrifices, but it does not help the hard-pressed decision-makers who grapple with the issues in real-life every day. ... (we need) ... to bring home the fact that giving priority to one group inevitably disadvantages others, a consequence which many advocates of particular equity principles fail to make clear (and they rarely state who will be called upon to make what sort of sacrifice even when they do acknowledge this implication)”. (128)

Actuaries may have to play the role of dismal scientists; we do need to identify winners and losers.

III DB benefit ratios are opaque and can be manipulated

If actuarial equity is a principle then it is of some concern that the internal rates of return obtained by individuals in DB schemes are arbitrarily determined. The original rules were often based on simple, and therefore tractable, formulae that were easy to administer in a pre-computerised environment. It can, however, be suspected that they were adopted for their being that much more attractive to wealthier and more influential groups of members.

Longevity

In the first place, these groups live longer and obtain benefits for longer. While Rob is correct that some annuity markets can be criticised in that they do not allow for socio-economic mortality differentials, this is invariably the case in private and public DB schemes. Some DC arrangements allow those with lower life expectancies to opt out of the cross subsidies, but at least in the UK, insurers now offer enhanced annuity rates to those with lower life expectancy. The cross-subsidy to the wealthy has long been recognised as in one of Rob's papers (Brown, 1998), but as he shows, is often more than compensated by greater social benefits to lower income individuals. I would suggest, however, that the extent of the cross subsidies needs to be continually monitored to ensure that there is not a "benefit creep" at the expense of less vocal members of the SSRS.

Different rates of salary increase

Less often recognised is the fact that greater weight is invariably given to later years of income in the determination of benefits. This is not only true for final average schemes, but even for career average arrangements revalued by an inflation rate lower than the average rate of salary growth. Workers from lower socio-economic groups have a flatter wage profile than those with higher incomes, and therefore their contributions to the SSRS at earlier ages have more time to earn a return. The same flatter salary scales apply to those who suffer from ill health later in their working lives. Both groups are not likely to be well represented amongst decision makers and may be not be adequately compensated by other means. Kaye (1985) reports some calculations by David Wilkie, which suggest that just 2% a year increase in salary relative to the average will yield a pension worth 50% more than the average. Coronado et al (2011) find that under certain assumptions that the US system can be seen as regressive – even with apparently significant non-earnings related benefits.

This particular cross subsidy would appear to need greater monitoring.

Demographic change

One could design PAYGO schemes so that the ratios between contributions and benefits are based on a more or less constant real return. Notional defined contribution (NDC) fall into this category. More frequent are schemes where the contributions or the benefits are adjusted with demographic change so that the return to each generation is dependent on the rate of

growth of the population and changes to longevity. The adjustments to the benefits and contributions – whether based on rules or on ad hoc changes – require some justification. Such justifications require very careful analysis as the changes may otherwise impose unfair burdens on different groups – and give unjustifiable windfalls to others.

One might respond by saying, as Robert Myers did in a response to Brown (1998) that the rates of return or money's worth ratios are not relevant to the purpose of SSRS, which are to meet economic and social needs in retirement and are based on solidarity. This however is to run the risks of pandering to the interests of powerful groups, and exposing the system to structural strains that may require traumatic adjustments.

Whatever the design, regular actuarial monitoring seems to be important to ensure balance and equity.

IV DC schemes are volatile

While DC arrangements objectively allocate benefits, those invested in equity markets produce very volatile results. Rob makes the case that the range of replacement ratios provided by DC schemes (which he shows would have varied by a factor of almost 6 over the past century in the US. Canon and Tonks (2013) confirm this for 16 countries in the OECD over the same period. Both sets of calculations, however, show that investment in equity markets would almost always have outperformed investment in bond markets – sometimes significantly. It could be argued that an economically neutral DB or NDC scheme should give a return on contributions equal to that of government bonds. The benefits of a DC arrangement invested in equities are volatile, but the volatility for the members appears, at first sight, to be almost all on the upside.

A number of economists and others have used these facts to argue for a switch to DC arrangements. Feldstein and Liebman (2002) provide a good summary of the issues and arguments. One underlying assumption is that private markets will allocate capital more effectively and that state control over projects should be avoided if possible. Engelen (2003) suggests that this may be based on a biased and overoptimistic view of the size of the equity risk premium. (See Damodaran (2011) for evidence of considerable overoptimism amongst academic economists in the nineties particularly).

The upside of DC schemes is also overstated because the return on government bonds is often artificially depressed. Reinhart *et al* (2011) provide evidence that the interest rate on government borrowing has been artificially depressed for a large part of the past century as part of a strategy of “financial repression” to reduce the size of the debt. Even in normal times, the shorter term government debt held by banks is largely held for liquidity purposes and is not a good measure of the returns on capital in society. Insurers and retirement funds may also hold longer term government debt for regulatory related reasons rather than as pure investments, which may also lead to artificially lower returns. Artificially lower returns on government debt helps explain the puzzle that equity risk premiums are too large to be explained by risk aversion alone.

Even allowing for overstatement, the arguments for investment freedom and the existence of a smaller but still significant equity risk premium do suggest that there is some role for DC arrangements with investment freedom. Rob, however, makes the widely accepted point that too much freedom – if members are encouraged to have individual accounts particularly – leads to higher expense charges and poor investment decisions. This provides an argument for group schemes with sensible investment default options, which actuaries are well placed to design.

The issues of balance and equity that are important in DB schemes are replaced in DC arrangements by issues of expense management and investment strategy – and issues of financial planning such as how much to save, the retirement date and annuitisation. These are not peculiarly actuarial skills, but actuaries are already providing advice to the managers of these funds and are able to make important contributions in this area. The area does appear to be underserved currently – and perhaps an area for the development of international actuarial standards.

V Mandatory contributions distort investment markets

This is an even more controversial area, but no less important for that.

A purist free market view would hold that both PAYGO and compulsory funded schemes distort what would be a natural capital market. In the absence of any government SSRS, people would “naturally” save something for retirement and one would expect the development of a capital market to allocate these savings to the most productive investments. Those holding this free market view would argue that free capital markets will allocate investments more efficiently than if they are “crowded out” by large PAYGO schemes or distorted by artificially stimulated funded schemes (either by compulsion or tax concessions). One could go further and argue that may also distort efficient markets by driving asset prices up and investment returns down.

Few take this purist view; most appear to be act more as lobbyists for a larger financial sector. McGrattan and Prescott (2013), for instance, argue that all taxes on investment income distort and should be removed, that a mandated retirement system with investment freedom would “dramatically increase welfare” and that:

“Mandatory savings and insurance, which are not binding for most people, do not distort the labor-leisure and intertemporal consumption choices. They do overcome some of the problem of some people not saving for retirement and relying on others for financing their retirement consumption.”

Underlying their model, and all the arguments for more funding, are highly speculative counterfactual assumptions about the productivity of investment – assuming that investment returns in private markets will greatly outperform those in the public sector and that members of SSRS will be able to enjoy such benefits. These assumptions are obviously debatable and would appear to be coloured by an interest in a large financial sector. As participants in the sector, actuaries should be aware of the possibilities that our views can be similarly coloured.

Financialisation

Financialisation has been used to describe this colouring of the thinking of those in the financial sector particularly. A number of observers see the increased funding of SSRS as contributing artificially to the growth of the finance industry – both ideologically and in its share of GNP. Outside the finance industry, this growth can be seen with some alarm as contributing to both inequality of incomes and greater speculation. Engelen (2003) refers to “increasingly speculative behaviour and a frantic search for financial innovations.”

Adair Turner (2009), then head of the UK Financial Services Authority and with a much closer link to the sector, takes a similar view:

“And, indeed, there are good reasons for believing that the financial industry, more than any other sector of the economy, has an ability to generate unnecessary demand for its own services – that more trading and more financial innovation can under some circumstances create harmful volatility against which customers have to hedge, creating more demand for trading liquidity and innovative products; that parts of the financial services industry have a unique ability to attract to themselves unnecessarily high returns and create instability which harms the rest of society.”

There are other reasons for the growth of the financial sector, and evidence that it contributes to economic development. Philippon (2007), for instance, finds the growth arises rather from technological change in that growing firms in the last 30 years have required more outside capital than previously. Rajan and Zingales (2003) document the contribution to economic development, but note the role of private interest groups in obstructing development in various countries of the world during the twentieth century. They suggest that one way of limiting the power of such interest groups is “public awareness of the hidden costs of policies that ostensibly promote economic stability.”

More concerning is the relatively invisible interconnectedness of the system. Vitali *et al* (2011) were able to investigate the ownership and control of 43,000 trans-national companies and found that “nearly 4/10 of the control over the economic value of TNCs in the world is held, via a complicated web of ownership relations, by a group of 147 TNCs in the core, which has almost full control over itself.” They point out the systemic risks that such interconnectivity creates.

Results like theirs also suggest the possibility of using the greater data processing power now available to better understand and monitor these risks. Farmer *et al* (2012) “outline a vision for an ambitious program to understand the economy and financial markets as a complex evolving system of coupled networks of interacting agents.” They envisage the use of existing micro-data on households, firms and particularly financial transactions (that is currently not collected and analysed) to produce forecasting tools.

It seems to me that the implementation of such models is a function for which actuaries are well suited. While expensive to create and run, the costs would be a minute proportion of the amounts being managed, and would justify the creation of significant actuarial functions within government.

This is a long term goal. In the shorter run, further thought can be given to ensuring greater diligence in the selection of investments and involvement in the corporate governance of the companies in which shares are held. Clark and Hebb (2005) suggested that there was a trend towards more active retirement fund management, and there may be evidence that this continues with social and environmental investment management principles being more widely accepted. Actuaries involved in the governance of retirement schemes will inevitably be involved. The Institute of Actuaries of Australia has identified “investment advice and governance” as a core capability of actuaries (Actuaries Institute, 2012), and so there would seem to be support for further development of actuarial skills and standards in this area.

Demographic distortions

Another distortion that can arise is that as a population begins to age, more assets are acquired by pension funds so pushing asset prices higher and once they have aged, dissaving reduces asset prices - as recognised most clearly in Japan (Nishimura, 2011). It seems that with an abundance of savings, interest rates can be pushed very low and even negative, so requiring more savings (certainly with matched DB schemes) and further pressure on interest rates.

This distortion can arise whether the SSRS is funded or not. If contributions exceed benefits temporarily, then the surplus needs to be disposed of or invested. This applies obviously to privately managed DC accounts. If a PAYGO scheme has no explicit assets, then the surplus is effectively lent to the state. Governments may use the money in a variety of ways. In both cases, there is a risk that the additional money is being taken from consumption and used to bid up the price of existing assets.

Is such an increase in asset prices unavoidable? Birkeland and Prescott (2007) calculated that the assets required to fund a SSRS in the USA (with its particular demographic and investment conditions) would amount to some 5 times GNP. This would exceed the available assets and so would require government to create additional government borrowing – or create asset price inflation. McGrattan and Prescott (2013), however, argue that if one includes the value of all land, and intangible business assets the asset markets are big enough to provide the base for a funded SSRS.

Whatever the theoretical possibilities, it does seem that funded schemes are vulnerable to capital market enthusiasms that can throw unseemly amounts of money at poor investments. This has been illustrated recently by the technology bubble at the turn of the century and the US housing bubble and its associated derivative instruments that led to the financial crisis.

Would the excesses be mitigated if there was greater awareness of the size and direction of demographically governed cash flows? It does seem to me that, in a scientific age when we have a huge capacity to measure and manage, our national economic statistics could be considerably more detailed and should include projections of cash flows into and out of the financial sector – so allowing governments and investors to adjust their capital spending accordingly.

VI Practical actuarial involvement in managing a Social Security System?

Rob is not alone in recommending a multi-pillared SSRS that includes a provision for basic needs and then some, and perhaps an element of investment smoothing for wealthier pensioners who participate in an earnings related component.

Such a system must include a centrally managed component if it is to have a redistributive function. The argument of this section III is that the redistribution needs to be subject to intense and ongoing scrutiny or it will be exploited by powerful groups. I doubt whether it is possible to develop rules for redistribution that will be robust enough not to require adaptation over time. It seems necessary to regularly determine the extent of the redistribution both within and between generations, and the relative needs of beneficiaries and contributors. I believe governmental treasury or finance departments should have the actuarial resources to collect the necessary data and perform and publish these analyses. Franco *et al* (2012) make some suggestions as to how this could be done although they do not seem to appreciate that most of the work is of a largely actuarial nature. International standards could perhaps be developed to set out appropriate assumptions and methodologies.

The standards could perhaps include the following. Measurement must be regular: triennially before computers but now at least annually. The reports should cover:

- The total liabilities of SSRS and the accrual over the past year – in total and by distinguishable groups of beneficiaries
- The assets available to pay the liabilities – including future contributions, government taxes – and the “returns” over the period
- The “emerging costs” showing the extent to which cash flows from the assets (including envisaged sales) will meet cash flows from the liabilities
- Changes to the assumptions and models – and the financial implications for future estimates
- Cross subsidies from one group to another with a particular focus on the labour market distortions created (such as restrictions on changing jobs and countries and early or late retirement.)

Actuaries make recommendations as to levels of premiums, contributions or benefits that must necessarily be determined to the last cent – in the full knowledge that another approach might lead to significant differences in the recommendation. Such recommendations require actuarial judgment: there is no single right answer, but there are possibly a number of wrong or bad answers. Failure to address how scheme deficits should be corrected, by setting out appropriate balancing mechanisms, is almost always wrong

The system should also include a funded DC element. The principle of subsidiarity would suggest that such funds should not be centralised, but should be large enough to obtain benefits of scale. Actuaries would play a different role. It seems to me that they could provide a regular report to the management of the fund that would cover:

- Financial soundness and the management of risks

- An analysis of investment performance and expenses
- Whether discretionary allocations of expenses and benefits were appropriate
- Whether member products and services and particularly financial advice are appropriate

VII Summary and conclusion

It seems to me that the myths to which Rob refers are based on mistaken assumptions and ideological pre-conceptions compounded by private interests, from which we need, as actuaries, to identify and distance ourselves.

As professionals with a deep understanding of the mechanics of SSRS operation and committed to the public interest, we can and should provide all stakeholders with clear information that allows them to make informed decisions about questions of redistribution – whether intra or inter-generationally. For DC funds particularly, we should be advising on the management of personal risk and on financial performance.

The impact of SSRS on investment markets is in some ways an unintended by-product of their operation rather than their design. Actuaries could play a greater role by more detailed projections of cash flows and in their governance in investment markets.

In all these cases, modern technological developments do allow for the collection of more micro-data that can be fruitfully used to create better actuarial models. Governments should develop actuarial capabilities to perform these analyses.

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