ADEQUACY OF THE AUSTRALIAN SUPERANNUATION GUARANTEE LEVY:

A post-retirement analysis

JOHN EVANS, Director of the Centre for Analysis of Complex Financial Systems
ABDUL RAZEED, Lecturer at the University of Sydney Business School

To date, most of the analysis of the adequacy of the superannuation guarantee levy (SGL) system has focused on the pre-retirement phase and ignored the volatility of the variables that affect SGL accumulations. Introducing volatility into the analysis, Ganegoda et al. (2017) conclude that the SGL system will provide highly variable retirement benefits. This paper extends their analysis by considering the combined effect of both longevity and the volatility of the equity capital market during the retirement phase. We find that the SGL system delivers highly variable standards of living in retirement across various cohorts of retirees, but in most situations provides the ASFA (2017) modest standard of living in retirement. We note that the age pension appears to provide retirees with the option to enjoy the ASFA (2017) comfortable standard of living knowing that if their assets run out they can access the age pension, which provides a standard of living only slightly lower than the ASFA modest level.

Academics have for some time used stochastic analysis to research the broad area of how people determine lifetime consumption and the effect of investment strategies on retirement benefits. Ando et al. (1963) determine a theoretical model of lifetime consumption in which consumption is a function of both income and wealth, with implications for consumption in retirement. Blake et al. (2001) undertake stochastic analysis of the impact of varying asset strategies on UK retirement accumulation benefits and conclude that a long-term high allocation to equities provides the best outcome. Blake et al. (2003) extend their 2001 study by considering the effects of alternative asset strategies in the post-retirement phase and again conclude that the most important decision for retirees is the allocation to equities.

Several studies analyse specific aspects of the SGL system. Basu et al. (2009) use stochastic analysis to illustrate that the gender inequality in Australian retirement funds, arising from periods of being out of the workforce, can be reduced by modest changes to contribution rates and asset strategies. Bianchi et al. (2016) use stochastic analysis to consider the retirement benefits of Indigenous Australians relative to non-Indigenous Australians. While several authors examine the overall adequacy of the SGL system (Gallagher 2011; Rothman 2011; Treasury 2009), as noted by Ganegoda et al. (2017), these papers ignore the effect of capital market volatility, which could have a serious impact on the adequacy of the SGL system.

Ganegoda et al. (2017) show that as a result of variables affecting the accumulation of SGL assets in the pre-retirement phase, the replacement ratio[1] for different cohorts of retirees can vary from 40 per cent to 400 per cent. Ganegoda et al. (2017) assume retirees buy an annuity to fund their retirement and, therefore, their study considers neither the continued impact of capital market volatility into the retirement phase nor post-retirement longevity issues.

In this paper, we analyse the impact of longevity and capital market volatility on the assets available from the SGL system in the retirement phase. We also estimate superannuants' subsequent eligibility for the age pension.

Methodology

We examine the case of a couple, a single male, and a single female retired with a retirement benefit (the retirement SGL amount) derived from the benefits estimated by Ganegoda et al. (2017). For each post-retirement year, we then add the investment return to the remaining capital, deducting drawdowns at either the comfortable or the modest standard of living, as determined by the Association of Superannuation Funds of Australia (ASFA 2017), and adding any age pension entitlement. We terminate our projections at age 100. We test for sensitivity to alternative investment strategies. The major assumptions and variables in our projections are as follows.

The retirement SGL amount

We assume a retirement SGL amount equal to the mean derived by Ganegoda et al. (2017) with five capital market shocks but we adjust for their assumption that employers would make contributions of 12 per cent of salaries, as this level of contribution has now been deferred until 2025.[2] We adjust the Ganegoda et al. (2017) retirement SGL amount to reflect an employer contribution of 9.5 per cent of salary. While they assume retirees commence employment in 2010, and work for 42 years, the assumed commencement date for the accumulation of contributions has little effect, and it is the duration of employment that has the material affect, and hence the adjusted Ganegoda et al. (2017) retirement SGL amounts are reasonable for our purposes. The assumed retirement SGL amounts are shown in Table 1.

TABLE 1: Retirement SGL amount

Retiree	Retirement SGL amount ($'000)
Couple	$1,302
Single male	$712
Single female	$590

Post-retirement investment strategy and returns

We assume retirees choose either a 'balanced' or 'conservative' investment strategy and do not change their strategy during the retirement phase. Investment returns for each year are simulated using @Risk[3] with a normal distribution of returns based on the data in Table 2, plus additional shocks to the equity capital markets.

TABLE 2: Assumed return distributions, five years to August 2016[4]

Strategy	Annualised return (% p.a.)	Annualised standard deviation (% p.a.)
Balanced	7.9	4.7
Conservative	5.4	2.1

Three scenarios for the shocks to the equity capital market are simulated, viz. no shocks, one shock in each seven-year period and one shock in each five-year period. The shocks are estimated by considering the equity market shocks that are reported in Ganegoda et al. (2017) and these are summarised in Table 3.

TABLE 3: Average annual equity market returns from significant historical shocks[5]

Year	Australian equities (%)	International equities (%)
1973	−50.9	−40.8
1981	−16.8	−10.0
1982	−2.5	−21.4
1987	−40.7	−16.3
1990	−14.6	−17.5
2002	−27.2	−11.3
2008	−24.5	−38.4
Average	**−25.3**	**−22.2**

To determine the return to be used to estimate the equity capital market shocks, the average annual returns in Table 3 are applied to the asset allocations shown in Table 4.[6] The resulting average impact of a capital market shock is also shown in Table 4.

TABLE 4: Assumed asset allocations

Allocations	Australian equities (%)	International equities (%)	Average impact (%)
Balanced	25	35	–14
Conservative	25	10	–9

The equity market shocks are introduced on a random basis at the average impact rate shown in Table 4 as additional investment returns for each year.

Post-retirement drawdowns

We assume retirees draw down an annual amount in addition to any age pension entitlement to achieve a total income necessary to maintain either a comfortable lifestyle ($60,000 p.a. for couples and $45,000 p.a. for single retirees) or a modest lifestyle ($35,000 p.a. for couples and $25,000 p.a. for single retirees) as defined by ASFA (2017).

Age pension eligibility

We determine the eligibility for the age pension by assuming that the only assets held by the retirees are their superannuation assets and their own home, and that the asset and income tests shown in Appendix A are applied throughout the retirement phase with the lower age pension from the application of the two tests (Australian Government Asset Test and Income Test) being paid (Department of Human Services 2017a).

To determine the application of the income test to the retirees' account balances each year we assume that the interest rates included in the age pension deeming provision shown in Appendix A will apply (Department of Human Services 2017b).

Real return adjustments

As we are using current age pension amounts and current ASFA (2017) drawdowns, for consistency we adjust the investment returns and the equity market historical shocks for inflation of 1.9 per cent p.a., being the average change in the Consumer Price Index (CPI)[7] for the five years to 1 September 2016.

SGL post-retirement adequacy

Table 5 indicates the age at which the retiree runs out of assets for each of the scenarios considered, with the age of 100 indicating that the retiree still has assets remaining at that age.

TABLE 5: Age at which retiree has nil retirement account balance

Investment strategy	Frequency of capital market shocks	Lifestyle drawdown	Couple	Single male	Single female
Balanced	nil	Modest	100	100	100
Balanced	nil	Comfortable	100	100	100
Balanced	1 in 7 years	Modest	100	100	100
Balanced	1 in 7 years	Comfortable	100	99	87
Balanced	1 in 5 years	Modest	100	100	100
Balanced	1 in 5 years	Comfortable	95	84	79
Conservative	nil	Modest	100	100	100
Conservative	nil	Comfortable	100	98	87
Conservative	1 in 7 years	Modest	100	100	100
Conservative	1 in 7 years	Comfortable	100	88	82
Conservative	1 in 5 years	Modest	100	100	100
Conservative	1 in 5 years	Comfortable	91	83	79

Allowing for reasonable and random equity market crashes, the results indicate that regardless of the investment strategy adopted retirees who are prepared to accept the ASFA modest standard of living could fund their retirement through to age 100. If retirees chose the higher, comfortable standard of living, they could run out of assets in their mid-to-late-80s depending upon the frequency of equity market crashes.

The current average life expectancy of retirees is around 20 years (Australian Government Actuary 2010), i.e. on average, retirees can expect to live until age 85, which suggests that for those whose lives are shorter than average, and have around the average expected retirement SGL amount, the SGL system will likely support a comfortable standard of living. But for those living longer than average, the SGL system is only likely to support a modest standard of living in retirement. The age pension eligibility does, however, provide an interesting option for retirees in that they could withdraw funds at the comfortable standard of living level knowing that if they run out of funds they would be eligible for the age pension, which would provide a standard of living not much lower than the ASFA modest standard of living.

Allowing for reasonable and random equity market crashes, the results indicate that regardless of the investment strategy adopted retirees who are prepared to accept the ASFA modest standard of living could fund their retirement through to age 100. If retirees chose the higher, comfortable standard of living, they could run out of assets in their mid-to-late-80s depending upon the frequency of equity market crashes.

Age pension entitlement

We include any age pension entitlement in the total amount drawn down each year. To illustrate the significance of the age pension to retirees once the SGL system becomes mature, Table 6 shows, for the scenarios considered, the earliest age at which retirees would become eligible for a part age pension.

TABLE 6: Age at which retiree is eligible for part age pension[8]

Investment strategy	Frequency of capital market shocks	Lifestyle drawdown	Couple	Single male	Single female
Balanced	nil	Modest	0	0	0
Balanced	nil	Comfortable	0	0	0
Balanced	1 in 7 years	Modest	0	0	0
Balanced	1 in 7 years	Comfortable	0	83	71
Balanced	1 in 5 years	Modest	0	88	73
Balanced	1 in 5 years	Comfortable	75	73	68
Conservative	nil	Modest	0	0	0
Conservative	nil	Comfortable	0	82	71
Conservative	1 in 7 years	Modest	0	0	0
Conservative	1 in 7 years	Comfortable	91	75	70
Conservative	1 in 5 years	Modest	0	0	0
Conservative	1 in 5 years	Comfortable	78	73	68

Table 6 indicates that retirees who choose to live at the ASFA modest standard of living will not draw any age pension. It needs to be recognised, however, that the modest standard of living is only marginally higher than that provided by the full age pension and retirees may not be happy with effectively having to fund their own age pension when the Australian Government is currently viewed as providing the age pension for nil direct cost to retirees. If retirees choose to live at the ASFA comfortable standard of living they would need age pension support as their assets fall below the level to support this standard of living from their 70s, particularly if equity market crashes occur reasonably frequently. In this situation, their total income would be below that of the comfortable standard of living.

Conclusion

Our analysis indicates that those in the SGL system for around 40 years with an average retirement SGL amount could attain the ASFA (2017) modest standard of living in retirement, and those with a shorter life expectancy than average could attain a comfortable standard of living. But those who expect to live longer than the average can only expect to achieve a modest standard of living in retirement.

This raises the issue of the suitability of the SGL system for the typical retiree when it appears that attaining a standard of living in retirement that is significantly higher than the age pension is largely dependent on the vagaries of equity markets and the longevity of retirees. It also appears that there is an unintended option for retirees to withdraw amounts at the comfortable standard of living, since the age pension is available if they run out of assets, and it would provide only a slightly lower living standard in retirement than the alternative ASFA modest standard of living.

Our analysis indicates that those in the SGL system for around 40 years with an average retirement SGL amount could attain the ASFA (2016) modest standard of living in retirement, and those with a shorter life expectancy than average could attain a comfortable standard of living. But those who expect to live longer than the average can only expect to achieve a modest standard of living in retirement.

Acknowledgement

The authors would like to acknowledge the contribution of Amandha Ganegoda to an earlier unpublished version of this paper, and also to some valuable comments from an anonymous referee on an earlier version of this paper.

Notes

1. Replacement ratio = disposable income post-retirement/disposable income pre-retirement.
2. Adapted from explanatory memorandum for *Mineral Resource Rent Tax Repeal and Other Measures Act 2014*.
3. @Risk Add-In for Microsoft Excel published by Palisade Corporation.
4. Data was sourced from Morningstar Australasia Pty Ltd.
5. Ganegoda et al. (2017).
6. Derived from the website for a large superannuation fund.
7. Australian Bureau of Statistics, Consumer Price Index, catalogue no. 6401.0.
8. Age 0 indicates the retiree does not become eligible for the age pension at any time during the projections.

References

Ando, A and Modigliani M, 1963, 'The "life cycle" hypothesis of saving: Aggregate implications and tests', *The American Economic Review*, vol. 53, no. 1, pp. 55–84.

Association of Superannuation Funds of Australia (ASFA) 2017, *Retirement Standard*.

Australian Government Actuary, 2010, *Australian Life Tables 2010–2012*.

Department of Human Services 2017a, *Australian Government Asset Test & Income Test*.

Department of Human Services 2017b, *Deeming*.

Basu, A and Drew, M 2009, 'The case for gender-sensitive superannuation plan design', *The Australian Economic Review*, vol. 42, no. 2, pp. 177–89.

Bianchi, R, Drew, M, Walk, A and Wiafe, O, 2016, 'Retirement adequacy of Indigenous Australians: A baseline study', *Economic Papers*, vol. 35, no. 4, pp. 359–74.

Blake D, Cairns, A and Dowd, K 2003, 'Pensionmetrics 2: Stochastic pension plan design during the distribution phase', *Insurance: Mathematics and Economics*, vol. 33, pp. 29–47.

Blake, D, Cairns, A and Dowd, K 2001, 'Pensionmetrics: Stochastic pension plan design and value-at-risk during the accumulation phase', *Insurance: Mathematics and Economics*, vol. 29, pp. 187–215.

Gallagher, P 2011, *Treasury measurement of retirement income adequacy*.

Ganegoda A and Evans, J 2017, 'The Australian retirement lottery: A system failure', *Australian Journal of Management*, vol. 42, no. 1, pp 3–31.

Rothman, G 2011, 'Projecting the adequacy of Australian retirement incomes', paper presented at the 19th Colloquium of Superannuation Researchers, University of New South Wales, Sydney.

Treasury 2009, *Australia's Future Tax System, Final Report*.

APPENDIX A: Age pension tests

Summary of age pension eligibility tests

Retiree	Income test	Asset test
Couple	<$292 income per fortnight = full pension; >$292 income per fortnight = full pension −$0.5 per $1 over $292; nil pension at $2,936 income per fortnight	Assets <$375,000 = full pension; Assets >$375,000, pension reduces by $3 per fortnight for each $1000 of assets; nil pension at $816,000.
Single male or female	<$164 income per fortnight = full pension; >$164 income per fortnight = full pension −$0.5 per $1 over $164; nil pension at $1,918.20 income per fortnight.	Assets <$25,000 = full pension; Assets >$250,000, pension reduces by $3 per fortnight for each $1,000 of assets; nil pension at $542,000.

Age pension deeming provisions

Retiree	Lower deeming asset level	Deeming rate for lower asset level	Deeming rate for balance of Assets
Couple	$81,600	1.75%	3.25%
Single male or female	$49,200	1.75%	3.25%