RETIREMENT INCOME ADEQUACY AND
THE EMERGING SUPERANNUATION SYSTEM
New Estimates

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ABSTRACT

The RIMHYPO model has been used to study the retirement incomes of hypothetical individuals and couples with different incomes and subject to different workforce patterns. Using a definition of replacement rate based on comparison of **real expenditure** after and before retirement, an assessment is made of the adequacy of retirement incomes arising from the full development of the Government's Superannuation Guarantee (SG) arrangements.

The hypothetical analysis is complemented by an aggregate analysis based on the RIMGROUP model which covers the entire Australian population, and their range of experiences.

The paper concludes that the age pension and fully implemented SG systems **combine** to provide replacement rates above frequently used benchmarks, even for low income workers with broken work patterns. While higher income earners have lower replacement rates with SG only superannuation savings, the aggregate analysis shows that taking realistic full saving rates into account, the higher income groups generally also achieve replacement rates exceeding 60%.

Aggregate analysis by income level also shows that the evolution of the system has a major positive effect in relation to replacement rates over time for both lower and upper deciles. Women workers have similar replacement rates to men.

As background to the analysis, the paper reviews recent data on contributions to superannuation. It concludes that employer contributions are in line with, and even slightly exceed, reasonable expectations while member contributions have been very strong, exceeding expectations. New projections of superannuation assets to 2020 are included.

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INTRODUCTION

Most people's income in retirement is provided by means of both superannuation and other financial assets, together, in most cases, with a part or full rate age pension.   This paper aims to provide an assessment of the adequacy of retirement income outcomes for a range of different life experiences together with an aggregate assessment of overall adequacy of the retirement income system. As background to these studies the paper reviews trends in the emerging superannuation system.

The first part of the paper outlines the results of a study looking at retirement incomes of hypothetical individuals and couples receiving different lifetime levels of income and subject to different workforce patterns.   Some insights into the adequacy of retirement incomes arising from the full development of the Government's Superannuation Guarantee arrangements are obtained by hypothetical analysis of retirement income and expenditure for people retiring in 35 or 40 years time.

This is complemented by an aggregate analysis which covers the entire Australian population, encompassing the range of labour force experiences, the range of retirement ages, varying superannuation coverage across the population and other financial savings outside of superannuation. The aggregate analysis is important as it provides comprehensive coverage of the time dimension, whereby the experiences of those retiring now can be compared with those retiring in thirty or forty years time.

The RIMHYPO and RIMGROUP models of the Retirement and Income Modelling Unit of the Treasury were used to obtain the results presented in this paper.

Policy Context and the Emerging Superannuation System

The three pillars of the superannuation system are very well known.   In summary, they consist of the means tested age pension which, together with other social security arrangements, provides income support for those individuals who have had limited opportunity to save for retirement during their working lives;   compulsory superannuation savings known as the Superannuation Guarantee (SG) which is set to increase to 9 per cent of salary and wages income by 2002-03;   and encouragement of voluntary savings through substantial tax concessions for superannuation savings.

However, there have been some claims over recent years that the current superannuation system will not be sufficient to meet people's needs in retirement.   Much of this discussion ignores the existence of the age pension pillar which will continue to be appropriately targeted to those who have limited personal means in retirement.   For example FitzGerald (1993) and Doyle (1997) both conclude that superannuation contributions of over 15 per cent of working income are needed over a 40 year working life to achieve an adequate retirement income **with no contribution from the age pension**.

Is the Superannuation System Sound?

For the superannuation system to make a major contribution to adequate incomes in retirement it is important that the system be sound and command widespread confidence.   The Australian retirement

income system is seen by the World Bank and the OECD as a world class system which can provide a model for countries developing or reforming their retirement income systems.

In fact the system has shown strong growth, exceeding expectations. In 1994 when superannuation assets were around $200 billion, our Unit then known as the Retirement Income Modelling Task Force (RIMTF) projected that superannuation assets would be about $367 billion in June 2000, a high level of expected growth. In fact the superannuation system has already passed this level of assets and at June 2000 is projected at around $430 billion. A recent OECD publication (OECD, 1998) shows the rate of growth of Australian superannuation assets as a percentage of GDP to be much higher than in most OECD countries. Of 25 countries, only Switzerland exceeded Australia's rate of superannuation assets growth. In view of the interest in such projections we have included an updated set of RIMGROUP based projections to 2020 in Attachment A. These projections incorporate all the major decisions that the Government has taken designed to further strengthen the system into the future. These include the introduction of spouse contributions, the introduction of Retirement Savings Accounts (RSA's), improved preservation arrangements and making choice of fund available.

Despite this apparently robust setting there are some detractors of the current system. Recently ASFA have produced a document titled 'Superannuation Contributions - Recent Trends' (ASFA, 1999). It claims that the system is in a generally unhealthy state with a poor prognosis for the future, that there is a lack of confidence in the system and that contributions are too low to fund adequate retirement incomes, even in a fully developed system. These assertions are challenged below and in this paper overall.

Claim. Employer contributions are weak and there has been a falling off in voluntary employer contributions showing a lack of confidence by contributors in the Australian superannuation system.

While there was only slight growth in employer contributions in 1996-97, APRA (Australian Prudential Regulation Authority) figures for recent quarters have been strong - the June 98 flow level is 34 per cent higher than the June 1995 flow and the September 1998 flow level is 36 per cent higher than the corresponding figure for 1995.
Alternative data on employer contributions are available additional to the APRA survey data, though these are not quite so up to date. The data from the ABS Labour On Costs Survey and ATO Statistics from the Returns of Superannuation Funds, confirm the strong rate of growth of employer contributions. Employer contributions are shown as rising by 41 per cent over the period from 1993/94 to 1996/97, rising from $11.3 billion to $16 billion (while coverage of superannuation at 91 per cent overall did not change over the period).

The related key issue is what should be taken as constituting a deterioration in "voluntary contributions" which might reflect a loss of confidence in the system. If an employer who is already paying superannuation contributions at a rate above the SG requirement, say at a rate of 10 per cent of salary, does not change that contribution rate when the SG rises, this is interpreted by some as constituting a reduction in voluntary contributions and a loss of confidence in the system. In fact it is a quite reasonable and practical course for employers already funding superannuation above (both old and new) SG minimums to leave their percentage contribution levels where they are. Such action does not represent a loss of confidence in the system. Our analysis suggests that this approach is broadly the one being taken by these employers, with actual employer contributions slightly exceeding the level implied by this model of employer behaviour.

In summary employer contributions are in line with, and even slightly exceed, reasonable expectations. At the same time member contributions have been exceptionally strong, exceeding expectations.

Claim. The Superannuation Surcharge has led to large reductions in contributions to superannuation.

Analysis of the pattern of surcharge tax collections does not reveal any noticeable dropping off in contributions. Similarly available evidence indicates that only a very small proportion of persons with income in the surcharge range have re-organised their salary packages to avoid or minimize the surcharge.

Most financial planners (eg AMP, 1999) and the RIM Unit find that superannuation remains a tax preferred investment, even where the full surcharge rate is being paid[1]. Accordingly, even if some monies were moved from the superannuation environment to other forms of investment the Government would gain from the revenue associated with that alternative investment. Further, the alternative investments would in due course contribute to the adequacy of retirement incomes.

Labour Force Patterns

People's labour force experience also has a significant impact on their ability to save and hence their retirement income. This experience varies across the community. While some people experience periods of 40 years or even more in stable full time employment, others experience long periods of unemployment or of casual or part time work. Early retirement has also become increasingly common. Changes in the age at which superannuation can be accessed may have an impact on this in the future. For example, people born after 30 June 1964 will not be able to access preserved superannuation benefits until retirement on or after age 60 (unless a condition of release is met). Currently the preservation age is 55.

The hypothetical analysis in this paper does not attempt to assess the proportions of people who may be affected by these and other labour force changes, but rather gives some insight into the impact of a range of different experiences on retirement incomes. The aggregate analysis on the other hand does cover both the proportions and trends in labour force participation and retirement in a comprehensive way. It is limited however by the type and size of the model which necessitates some 'pooling' or aggregation of different experiences (see section below).

The Research Context

There have been several recent studies looking at adequacy and structure of retirement incomes in Australia and internationally. Johnson (1998) compared a number of OECD countries' retirement income systems. He notes that the Australian public pension system is unique in being entirely means tested. Further, spending is predicted to remain below 5 per cent of GDP; by comparison many other OECD countries examined have rates predicted to peak at 7-10 per cent of GDP (US, New Zealand and Canada) or even higher at 14-20 per cent of GDP by 2040, namely in Germany, France, Japan and Italy.

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[1] Of course, contributions in excess of those required to reach reasonable benefit limits may not be taxed concessionally, as additional ETP amounts are taxed at 48.5%.

Johnson also found that for Australia net pension as a proportion of national average net earnings was 33 per cent.   Johnson's measure is taken in the first year of retirement.   By comparison this paper using the approach outlined in Brown (1995) and discussed below has found that the ratio of full rate DSS payments over the whole of retirement to final working year net salary for a single person was 37 per cent.   The difference reflects increasing real pensions received over the period of retirement. (Australian aged pensions are indexed to the greater of the movements in the CPI or Male Total Average Weekly Earnings which means on average that they increase in real terms compared to inflation.)   Johnson's study also noted the significant improvements in 'private' coverage (especially among women working part time) achieved by the Superannuation Guarantee system in Australia, while noting also that this system does not develop its full impact until after 2030.

Whiteford (1999) notes the importance of a consumption based replacement rate concept, a version of which is used in the current study.   Whiteford also notes the potential to include the benefits of owner occupied housing and public health care in the assessment of adequacy.   If this were done, it would significantly improve current measures for Australia.

The Models

As indicated the results in this paper were obtained using two different models.   First, the Retirement and Income Modelling (RIM) Unit's RIMHYPO model was used.   This model takes an individual or couple from workforce entry to death, and determines the accumulation of superannuation benefits, social security payments and overall retirement incomes.   Brown and McDiarmid (1995) provided detail on the code structure of the RIMHYPO model.   While there have been changes to the code and model user interface since 1995, to take account of changes to Government policy, the broad structure of the model remains intact.

The RIMHYPO model has several advantages over other hypothetical models that are used to estimate retirement incomes.   It models the interactions between the taxation and social security systems and can be used to look at the position for hypothetical couples as well as individuals.   It can also be used to assess the sensitivity of results to changes in policy parameters and life cycle events using a user-friendly interface.   It is however by nature not an aggregate model and cannot be used for costing of overall policy changes.   Thus, while different types of experiences can be modelled, there is no mechanism for determining how many people would be in each group.

RIMGROUP is a comprehensive cohort projection model of the Australian population which starts with a population and labour force model, tracks the accumulation of superannuation in a specified set of account types, estimates non superannuation savings, and calculates tax liabilities, social security payments including pensions and the generation of other retirement incomes.

These projections are done for each year of the projection period *separately for each birthyear gender decile cohort*.   The model projections begin in July 1992.

RIMGROUP is a very large model incorporating some 113,000 records, with thousands of variables calculated for each record and with subgroups formed for those with different superannuation accounts, different ages of retirement and so on.   Nonetheless, it is not an individually based microsimulation and there is some necessary 'pooling' of work experiences, account balances, income levels and so on. For example, unemployment is viewed as a temporary phenomenon and superannuation accumulation

is shared by those working and (temporarily) not working[2]. Similarly migrants are pooled with others in the model and may dilute the assets of the group they join.

Aggregate modelling based on RIMGROUP has been of considerable policy significance, see for example Gallagher (1995), Rothman (1996,1997,1998). More details of the RIMGROUP model, the approach taken to modelling retirement and the current set of economic parameters used are in Attachment B.

PART 1: HYPOTHETICAL ANALYSIS

Definitions and Methodology

The Scenarios

The RIMHYPO model was used to estimate results for hypothetical individuals and couples under a number of different scenarios. Relevant combinations of life events, government policies and retirement income sources were set by the analyst. Parameters in the model were set taking into account current legislated superannuation and other policy settings.

The individual cases are three males who start work at age 25 in 1997, and live to age 82. The age at death is based on reasonable projected life expectancies for men who will be aged 65 in 2036. The individuals are assumed to receive incomes of half times, once or twice Average Weekly Ordinary Times Earnings (AWOTE) throughout their working lives. These individuals are assumed to retire at age 60 and at age 65, and take retirement benefits as an Eligible Termination Payment (ETP), or 50 per cent ETP and 50 per cent lifetime pension/ annuity (these are not means tested for social security purposes), or 50 per cent ETP and 50 per cent allocated pension (such pensions are means tested for social security purposes). The results provided in Tables 1-3 (Tables 1A-6A in Attachment C) give an indication of the effect of retiring earlier than age 65 and the impact of different investment strategies for taking superannuation benefits.

The individuals are then subject to periods of unemployment or part time work. In these cases individuals are assumed to retire at age 65 and take their benefits as 50 per cent ETP and 50 per cent lifetime pension or annuity. The results are presented in Tables 7A, 8A and 9A of Attachment C and show the impact of an early and mid career period of unemployment as well as the impact of working part time in later years of working life. Other possibilities could obviously be modelled. These were chosen as they are representative of a range of possibilities that people may face during their careers.

We have also looked at a number of hypothetical couples. A simplifying assumption is that couples are assumed to be born in the same year, to marry and both start work as employees in 1997 at age 25, and, in the case of the male, live to age 82 and the female to age 86. The ages at death are based on projected life expectancies for those who will be aged 65 in 2036.

Four types of couples are examined, namely: a lower income couple where both individuals receive incomes of 50 per cent of AWOTE throughout their time in the workforce, an upper middle income couple where both individuals receive incomes equal to AWOTE, a high income couple where both individuals receive incomes of twice AWOTE and a couple where the male receives income of twice AWOTE and the female income of 0.5 times AWOTE. These couples are assumed to retire at age 60

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[2] But those permanently unable to work through disability are distinguished and treated separately.

and at age 65, and take retirement benefits as an Eligible Termination Payment (ETP), or 50 per cent ETP and 50 per cent lifetime pension/ annuity (these are not means tested for social security purposes), or 50 per cent ETP and 50 per cent allocated pension (such pensions are means tested for social security purposes).   The results (provided in Tables 4 and 5 and Tables 10A-15A of Attachment C) give an indication of the effect on retirement incomes of retiring earlier than age 65 and the impact of applying different investment strategies to the accrued superannuation benefit.

We have then assumed different scenarios namely where the female member of the couple works full time throughout and the male member of the couple experiences a period of unemployment or part time work.   We also look at a possible child rearing scenario.   In all these cases individuals are assumed to retire at age 65 and take their benefits as 50 per cent ETP and 50 per cent lifetime pension or annuity.   The results are presented in Tables 16A-18A of Attachment C and show the impact of an early or mid career period of unemployment as well as the impact of working part time in later years of working life.   The results also show the impact of a period of withdrawal from the workforce early on for the purposes of child rearing, combined with part time work in mid career.   Again, many other possibilities could be envisaged, but these give an idea of the impact of different possible experiences.

Replacement Rate measures

The improvement in retirement income (from the SG) is calculated by comparing the average annual net potential expenditure (including capital draw downs) in retirement to the average DSS payments that would be received if full rates were payable throughout retirement.   The average of all DSS payments in retirement rather than just age pension payments was used.   This is because in some of the age 60 retirement scenarios people may have received mature age allowance from age 60 until they were eligible for the age pension at age 65.   This would occur where total superannuation assets are low at retirement or where superannuation is taken in the form of 50 per cent life time pension and 50 per cent ETP and the ETP amount is not so large as to breach the Social Security assets (and income) tests.   Life time pensions are exempt from Social Security assets tests, while allocated pensions are not exempt.

Two different replacement rate calculations are provided, namely:

- Real Average Annual Net Potential Expenditure in retirement compared to Final Working Year Net Salary;   and

- Ratio of real Average Annual Net Potential Expenditure in retirement to real Average Working Life Net Salary.

The purpose of constructing replacement rate measures is to assess how well retirement income policies or products enable people to maintain their previous living standards into retirement.

The concept of Average Annual Net Potential Expenditure in retirement is a consumption expenditure concept designed to reflect the potential standard of living.   It includes income from investments, all pension payments including social security payments, and drawdowns from capital (that is dissaving in retirement) less any taxation payable.   The Final Working Year Net Salary is also a consumption expenditure concept, as it represents the amount of expenditure after superannuation payments and taxation have been allowed for.   Consumption expenditure concepts give a more accurate picture of replacement rates in retirement than assessable income concepts.

Replacement rates based on an income concept only, may overstate living standards prior to retirement as they include amounts that are actually saved prior to retirement, and for this reason understate the extent to which retirement savings maintain living standards.   Also there is dissaving (capital drawdown) in retirement and to exclude this from the retirees' standard of living compounds the error.   In effect, measures based purely on income ignore the aim of retirement saving, which is to defer consumption from a person's working life into retirement.[3]

In all cases, the Final Working Year Net Salary is assumed to be the after tax salary that would have been received if the person had been working full time in their final year of work.   This enables a fairer comparison of different retirement income outcomes.   Without this adjustment being made, the replacement rate for someone who happened to be working part time in their final year would look much higher than for someone who was a full time employee in their final year of work.

We have also provided the ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary.   The Average Working Life Net Salary is smaller than Final Working Year Net Salary, because it is an average taken over a period of up to 40 years with no adjustment for productivity improvements in the base.   Hence the replacement rate using this working life average base appears to be higher.   When looking at these ratios therefore, it is also important to remember that (in addition to the labour income productivity effects) for those who have experienced periods of unemployment or part time employment, the replacement rate with a working life average base may look higher than if they had worked full time throughout.

The potential replacement rate for social security payments is shown as the ratio of maximum DSS payments if full rates are payable over the whole of retirement compared to the Final Working Year Net Salary.   Finally the ratio of the actual DSS payments received in retirement is shown as a proportion of the average Full Rate DSS payment as if it were received throughout retirement.

Parameter Assumptions

The results in all hypothetical tables were calculated under current legislated policy parameters and assuming long run annual CPI increases of 2.5 per cent, annual increases in wages and salaries of 3.5 per cent, a long term bond rate of 6 per cent and a fund earning rate of 7 per cent.
As already indicated, three possible investment strategies are looked at.   First, one hundred per cent of superannuation benefit is paid out as a lump sum which is invested in fixed interest products with annuity drawdown.   Fixed interest earnings are assumed to be 4 per cent.   Second, 50 per cent of benefit is taken as a lump sum and 50 per cent as an allocated pension (not exempt under social security means test) and third 50 per cent is taken as a lump sum and 50 per cent as a lifetime pension (exempt under social security means test).   The Age Pension is indexed to AWE.   The existing tax scales are indexed to AWE annually.   Indexing the tax scales to AWE means that long term projected results will not be confounded by differently indexed parameters.

Results

A complete set of the results obtained is at Attachment C.   Selected Tables are included below.

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[3]   More details on this concept are available in Brown, C. (1995)

SINGLE INDIVIDUALS

Table 1 Single Person Retiring at Age 65 and Receiving 100 Per Cent ETP with annuity drawdown

SALARY - as multiple of AWOTE	ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS - (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	(a)	(b)	(c)	(d)	(e)
0.5	166%	107%	128%	64%	96%
1.0	206%	76%	91%	37%	71%
2.0	274%	57%	69%	21%	34%

Table 1 shows that, as expected, the adequacy of retirement income measured by the ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments increases with working life salary.   With standard SG contributions, replacement rates decrease with working life salaries but even at quite high salary levels (twice the average) are close to the replacement rate of around 60 per cent generally used by actuaries (Doyle, 1997)[4].   Some age pension is still received (largely later in retirement) by people with incomes of twice the average.   The 9 per cent SG is thus having a significant impact on people's incomes in retirement even at very low levels of working life income, with real incomes in retirement being actually slightly higher than received during working life at salary of 0.5 AWOTE.   Without superannuation, someone on 0.5 AWOTE would have a replacement rate from the Age Pension of 64 per cent, while with superannuation and receiving 96 per cent of the full rate Age Pension, the replacement rate is 107 per cent (reflecting in part the end growth of the age pension over 17 years of retirement).

Table 2 Single Person Retiring at Age 65 and Receiving 50 Per Cent ETP and 50 Per Cent Life Pension

SALARY - as multiple of AWOTE	ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS - (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	(a)	(b)	(c)	(d)	(e)
0.5	163%	105%	126%	64%	98%
1.0	214%	79%	94%	37%	84%
2.0	289%	61%	73%	21%	60%

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[4] The International Labour Organisation (ILO) Social Security (Minimum Standards) Convention, 1952 (no.102) stipulates that after 30 years of coverage, a retirement pension should not represent less than 40 per cent of a couple's previous earnings.   Reduction for shorter insured careers (less than 30 years) could be between 1 1/3 and 2 per cent per year missing. Using these factors, after 40 years an equivalent replacement rate could be proposed to be between 50 and 60 per cent (ILO-OECD, 1997).

Comparing Table 2 with Table 1 reveals the impact of taking superannuation partly in the form of a life pension.   At the lowest level of income this reduces adequacy slightly probably because the full impact of the ETP tax free threshold is not received, and fees are payable for the life pension.   While there is an increase in the age pension payable, (life pensions are not assets tested for social security purposes), this only partly compensates for these effects at low levels of income.   At higher levels of income, the proportion of DSS payments received decreases.   Also at higher levels of income the impact of fees etc. is proportionately less, and overall adequacy and replacement rates increase compared to the ETP only case.   Now approximately half the asset is no longer subject to social security assets tests.   This is a better investment strategy (of those modelled) for people who had received working life incomes of AWOTE or above.

The results are higher than obtained using an allocated pension (Tables 5A and 6A of Attachment C) since the allocated pension is assets tested for social security purposes.   Nevertheless, for higher levels of income, allocated pensions give higher returns that taking 100 per cent ETP (returns on allocated pensions are better than the fixed interest options used here for ETPs) while at lower levels of income, taking and investing an ETP provides a slightly better outcome than either of the pension options as already noted.

Table 3 Single Person Retiring at Age 60 and Receiving 50 Per Cent ETP and 50 Per Cent Life Pension

SALARY - as multiple of AWOTE	ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS - (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	(a)	(b)	(c)	(d)	(e)
0.5	144%	95%	111%	66%	97%
1.0	178%	67%	78%	38%	86%
2.0	224%	48%	56%	21%	59%

Comparing Tables 2 and 3 shows that retiring at age 60 rather than age 65 significantly reduces retirement income adequacy and replacement rates at all income levels.   This effect is greater at higher levels of income.   For the 0.5 case, retiring early lowers the proportion of full rate retirement DSS payments received because the full rate payments now include an amount for Mature Age Allowance. A retired person who had received 0.5 AWOTE during their working life does not receive the full Mature Age Allowance because of social security asset and income tests.   At higher levels of income, a significant increase in the Age Pension payable from age 65 (because of the reduced income from superannuation) overcomes the impact of not receiving the Mature Age Allowance from age 60-65.

Unsurprisingly, periods of unemployment and working part time also impact negatively on retirement incomes as would be expected, reducing adequacy and replacement rates (Tables 7A-9A of Attachment C).   For example, a period of unemployment (and taking of hardship provisions) from age 30-34 reduces adequacy from 166 per cent to 146 per cent at salary of 0.5 times AWOTE.   At this salary level only small amounts superannuation have been accumulated prior to the period of unemployment so the hardship provisions have relatively little impact compared to a period of

unemployment from age 40-44.   This later period of unemployment reduces adequacy from 166 per cent to 122 per cent, largely for this reason.   At the twice AWOTE case, the later period of unemployment has less impact than the earlier period.   This is because the amount of superannuation that can be taken under the hardship provisions is relatively less compared to the size of the asset.   The effect of the reduction in compound interest on the earnings is now relatively more important.

COUPLES

Full results for couples are at Tables 11A to 19A of Attachment C.   Table 4 below provides combined results for a couple in employment from age 25, retiring at age 65 and receiving superannuation benefit in the form of 100 per cent ETP.   Comparing Tables 1 and 4 shows that the pattern of results obtained for couples is similar to that for individuals.   The main difference is that couple replacement rates tend to be lower at higher levels of income.   This is because DSS payments for couples are not twice the amounts for single people, while Final Working Year Net Salary is double for couples both earning the same amount.   This is accentuated by the effects of DSS means tests.

Table 4 Combined Results for Couple Retiring at Age 65 and Receiving 100 Per Cent ETP with annuity drawdown

SALARY - as multiple of AWOTE		ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS – (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	Female	(a)	(b)	(c)	(d)	(e)
0.5	0.5	168%	93%	112%	55%	90%
1.0	1.0	201%	64%	76%	32%	49%
2.0	2.0	280%	51%	61%	18%	18%
2.0	0.5	215%	71%	86%	39%	39%

Table 5 Couple Retiring at Age 65 and Receiving 50 Per Cent ETP and 50 Per Cent Life Pension

SALARY - as multiple of AWOTE		ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS – (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	Female	(a)	(b)	(c)	(d)	(e)
0.5	0.5	167%	93%	111%	55%	95%
1.0	1.0	219%	69%	83%	32%	78%
2.0	2.0	295%	53%	64%	18%	41%
2.0	0.5	234%	79%	94%	39%	72%

As for single people, Table 5 shows that taking 50 per cent of the superannuation benefit as a life pension significantly improves retirement outcomes at higher levels of income, but has little impact for the 0.5 AWOTE case.

Tables 14A and 15A of Attachment C show that taking 50 per cent of superannuation as an allocated pension tends to reduce retirement incomes compared to the 50 per cent life pension option, but is still better than taking the whole benefit as an ETP, for the higher income groups.

Table 6 Couple Retiring at Age 60 and Receiving 50 Per Cent ETP and 50 Per Cent Life Pension

SALARY - as multiple of AWOTE		ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS – (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	Female	(a)	(b)	(c)	(d)	(e)
0.5	0.5	148%	83%	98%	56%	96%
1.0	1.0	175%	56%	66%	32%	71%
2.0	2.0	235%	43%	51%	18%	54%
2.0	0.5	186%	64%	75%	40%	68%

Again retiring at age 60 significantly reduces adequacy and replacement rates for all income groups. The increased level of DSS payments do not fully compensate for the reductions in superannuation income.   This is compounded by the full rate DSS payments increasing because of the inclusion of mature age allowance payments from age 60-64.   These payments are not fully available to people with substantial ETPs.   Life pensions are exempt from DSS assets tests (but not income tests).

In the case of couples where one partner experiences a period of unemployment, or works part time, (see Tables 16A-19A of Attachment C) the results are not influenced by the hardship provisions. Because their partner remains in employment, the other generally cannot receive Social Security payments (except in the 0.5 AWOTE case).   Hence superannuation cannot be accessed.   In these cases a later period of unemployment has less impact than an earlier period.   This is due to the greater loss of compound interest on earnings resulting from the earlier period of unemployment.   A period of part time work later in the career has less impact than earlier periods of unemployment for the same reason.

PART 2: AGGREGATE ANALYSIS

Adequacy

As with the hypothetical analysis, the main adequacy concept used is a replacement rate based on post retirement consumption expenditure compared with pre retirement expenditure.   As before this includes income from all investments, all pension payments including social security payments, and drawdowns from capital less any taxation payable.   Current legislated policy parameters are used.   However in this aggregate analysis the comparison drawn is between the expenditure of retirees for the 5 years after pension eligibility age with income for the 5 years before age pension eligibility age.   Given the structure of RIMGROUP in which new retirees are pooled with existing retirees, this definition makes it easier to do aggregate analysis, while distinguishing between cohorts which may have retired a decade or more earlier.   The distinction is relevant because, in general, retirees do not maintain a living standard in retirement that is fully linked to average wages– while the age pension is linked to total male average wages, the mix of investments of retirees means that their non pension income, which is mainly sourced from interest bearing investments and may have capital drawdowns, will generally not grow in real terms.

What differentiates the aggregate from the hypothetical analysis?

The prime difference between aggregate and hypothetical analysis is the coverage in the aggregate analysis of the entire Australian population.   Aggregate analysis covers the range of labour force experiences including unemployment and other breaks from the labour force, the range of retirement ages, and the varying superannuation coverage across the population including some schemes with better than SG rates of contribution, salary sacrifice arrangements, and member contributions. Additionally RIMGROUP estimates other financial savings at retirement and adds these to the pool of monies to be allocated and invested at retirement.   RIMGROUP also allocates retirement investments patterns in a realistic way and   allows for dissipation at retirement and drawdowns during retirement. These patterns are a function of gender and decile, although the data base is not comprehensive in all of these respects.

Also important in the aggregate analysis is the time dimension, whereby the experiences of those retiring now can be compared with those retiring in thirty or forty years - time is an important and automatic dimension of the analysis.   The hypothetical analysis presented in this paper only looks at those retiring in 35 or 40 years time.

The aggregate modelled results for the present time with its low nominal investment returns are higher than Johnson's (1998) finding of 33% replacement rate from the age pension alone, reflecting modest income from additional investments (Johnson says that for the middle quintile currently 88% of total income comes from a government pension).   The value added in the analysis presented below is the capacity to project changing replacement ratios up to 50 years into the future with realistic superannuation and other savings and assuming high drawdown of assets in retirement.   As the SG system matures the modelled replacement rates rise sharply.

Potential Aggregate Replacement Rates

For an analysis of potential replacement rates it seems appropriate to assume that assets are largely drawn down in an annuity pattern over the person's or couple's retirement.   This reflects the approach taken in the hypothetical analysis and gives a measure of the potential afforded by the retirement income framework.   In practice, given uncertainty as to their longevity, most prudent people won't quite achieve this and as an operational compromise we have assumed annuity drawdown of all fixed interest deposits but only modest drawdown of shares and allocated pensions.   This assumed pattern together with a broad continuation of labour force and retirement trends and tendencies and continuation of recent investment patterns in retirement is the basis of all the aggregate results which follow.

Ratios of retirement expenditure over recent pre retirement expenditure are calculated for two groups: those who have had long term superannuation coverage, and the full population, adding in those who have had little or no superannuation coverage, including the self employed who have chosen not to contribute.   For convenience we will call these 'workers' and 'all'.   The time analysis of aggregate replacement ratios for these two groups is shown in Chart 1 below.

CHART 1:   Potential Aggregate Replacement Ratios – All Workers and Full Population

Annuity Drawdown Ratios
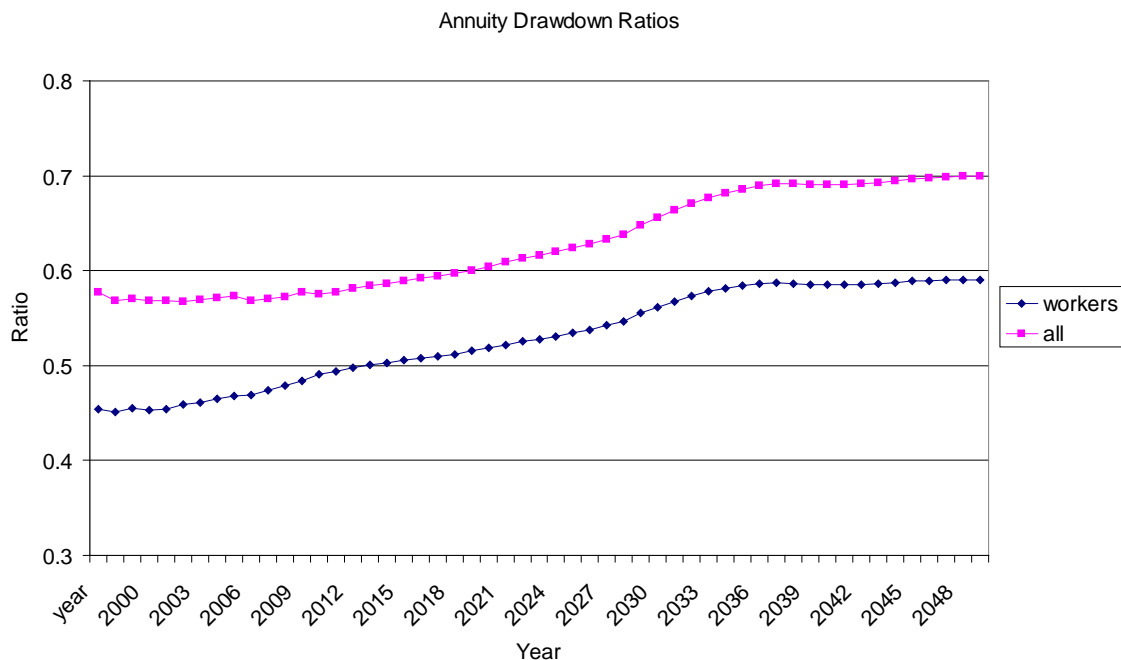
Replacement ratios rise significantly over time: in the case of workers from 45 per cent currently to 59 per cent by 2038.   For the 'all' group the replacement ratios are just under 60 per cent now and rising to about 70 per cent from 2030 on.

Gender

It is well established that women have markedly different labour force participation compared to men, with much longer periods out of the workforce, more part time work, and lower wages on average than

men. All these patterns are built into the aggregate model together with projections which show a continuing increase in the work force participation of women. Also included are superannuation coverage and contribution rates for women. For women working as full time employees, coverage rates are slightly higher than those of men. However, given that a greater proportion of women are working part time, coverage for women employees overall at 90 per cent is a little lower than the corresponding 92.5 per cent rate for men (APRA, 1999). Chart 2 below shows only marginal difference in the replacement ratios and similar pattern over time for women workers compared to the total of men and women workers in Chart 1.

CHART 2:   Potential Aggregate Replacement Ratios For Women

Ratios for Women

However the pattern for all women is distinctly different to the pattern for men and women combined as shown in Chart 1. This reflects the increasing workforce participation of women changing non workers to workers and thereby reducing the group ratio, with this effect eventually overcome by the effect from increasing superannuation wealth.

Of course all these ratios are relative. In absolute terms the income of women workers pre retirement is around 85 per cent of the group as a whole, and similarly women have around this level of post retirement income.

By Income Level

Also within the annuity drawdown framework it is interesting to analyze replacement ratios by income level which is done conveniently within RIMGROUP using the decile structure.   This is done in Chart 3 below.

A number of interesting comparisons can be made.   Firstly, the decile 5 ratios behave much the same way as the averages in Chart 2 but are marginally lower.

CHART 3:   Potential Aggregate Replacement Ratios for Selected Deciles
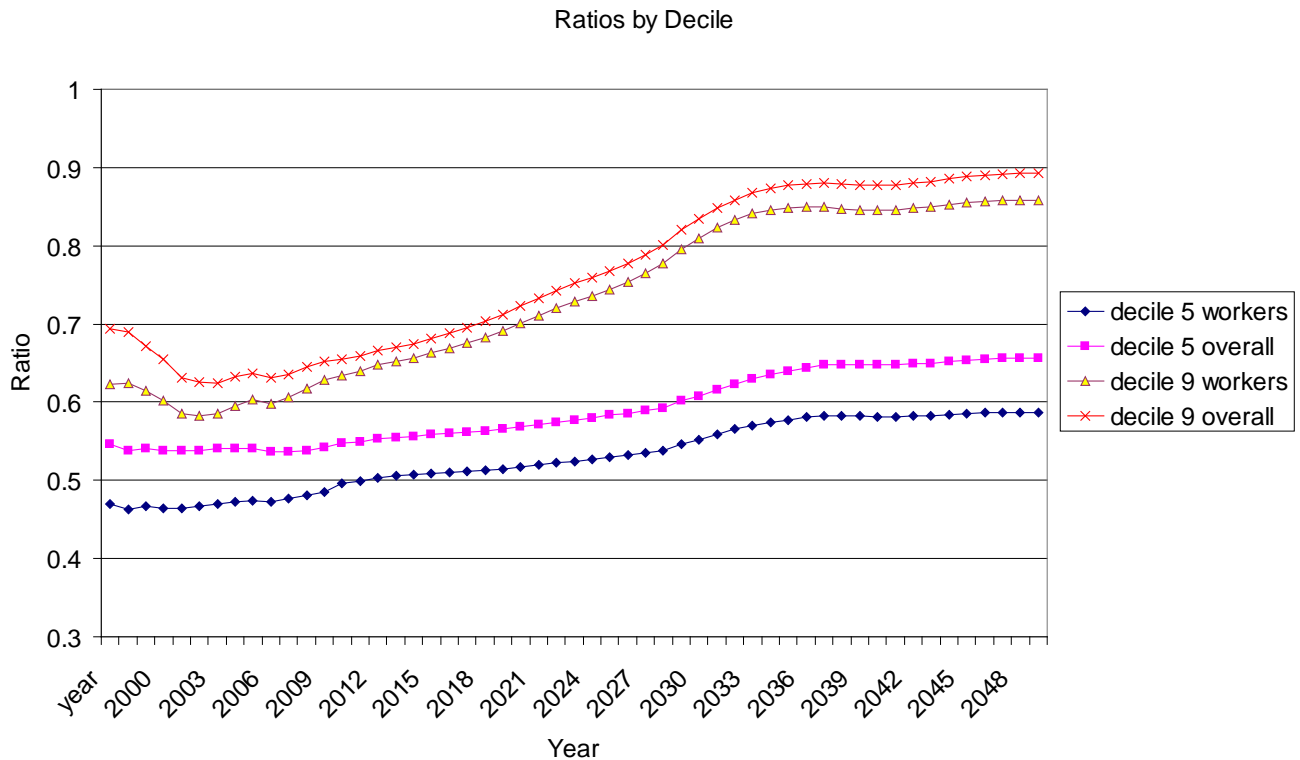
The next comparison is more startling at first – the replacement ratios for decile 9 are generally higher than for decile 5 and this appears markedly different to the hypothetical picture where replacement ratios drop as income rises.   There is no conflict, however, as this aggregate picture includes all forms of saving for the 9th decile, not just superannuation, and importantly also reflects the established pattern that actual superannuation contribution rates as a percentage of income rise with rising income (Rothman, 1995).   Accordingly while SG only savings would give the replacement rate dropping as income rises, actual savings patterns do not.

Conclusions

Firstly, and importantly given recent contributions to the debate, we conclude that no discussion of adequacy can be considered complete or even particularly useful without incorporating the role of the age pension.   The age pension is an integral part of the Australian retirement income system.   The age pension and SG systems combined provide Australians, particularly low income earners, with high replacement rates of pre-retirement net expenditure by world standards.

We consider that replacement rate based on comparison of net expenditure after and before retirement to be the right basic concept. Replacement rates based on income concepts only, overstate living standards prior to retirement, as they include amounts that are actually saved prior to retirement; they also exclude capital drawdowns in retirement, and therefore understate the extent to which retirement savings maintain living standards.   Measures based on expenditure concepts incorporate the aim of retirement saving which is to defer some consumption from a person's working life into retirement.   Within an expenditure based framework there are a number of different replacement rate measures than can be used, each with advantages and disadvantages.   Generally it is best to use a measure that is minimally distorted by assumed ongoing productivity improvements reflected in wages growth (column (b) in the hypothetical results tables).

The significant general conclusion that can be drawn from the hypothetical cases is that replacement rates of retirement expenditure from a fully implemented SG system significantly exceed those from a full rate age pension and meet the frequently used 60 per cent replacement rate (Doyle, 1997), for all except the very high income earning groups.   The aggregate analysis shows that when one takes realistic full saving rates into account, the higher income groups generally also achieve replacement rates that exceed 60 per cent.

The investment mix in retirement is also shown to be important in the hypothetical cases.   This reflects the taxation treatment of ETPs, as well as social security income and assets tests.   Low income earners do marginally better taking all their accumulation as an ETP.   For this group, the social security assets test does not apply as they have insufficient assets, the tax free ETP threshold makes up a significant component of their ETP, and fees and charges incurred from obtaining a life pension also have an impact.   For average and higher income earners, the best results are obtained incorporating a life pension as part of the investment mix.   This is because life pension products are not tested under the social security assets test, while if taken as an ETP or allocated pension the assets test would apply.

The aggregate analysis incorporates the experiences of the whole population, accounts for savings above the base SG level, and adds a valuable time dimension whereby the experiences of those retiring now can be compared with those retiring in thirty or forty years.   For an analysis of potential replacement rates it seems appropriate to assume that assets are largely drawn down in an annuity pattern over the period of the person's or couple's retirement.   The aggregate analysis on this basis shows replacement ratios for workers rising significantly from 45 per cent currently to 59 per cent by 2038.   For the 'all' group the replacement ratios rise from just under 60 per cent now to about 70 per cent from 2030 on.

The aggregate analysis shows that in absolute terms the income of women workers pre retirement is around 85 per cent of the group as a whole and women also have around this level of post retirement income.   Accordingly women workers show only marginal difference in their replacement ratios compared with the total of men and women workers and a similar pattern over time.

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PROJECTIONS OF   SUPERANNUATION ASSETS TO 2020

The Table below shows RIMGROUP projections for selected financial years out to 2019-2020. Numbers do not add across as some funds within the superannuation system, such as rollover funds, annuities and allocated pensions held on behalf of the retired, have not been explicitly listed.

Clearly no one knows the future in detail for even a short time, and the projections have bands of uncertainty around them which increase as we go further out.   The projected levels are particularly sensitive to economic assumptions such as the level of return achieved by various fund;   as an example, an annual difference of one half of a percent in return over the period to June 2005 changes the grand asset total by plus or minus $17b.

Broad agreement with other longer term projections will largely reflect common parameter settings for rates of return and other economic factors. There are also some other major views about the future which significantly impact on the longer term dynamics and which are either difficult to estimate or to some extent unknowable, including:

• the extent to which the established funds which offer higher levels of contribution than the SG will retain these higher levels;

• the rate of closure of the more generous private sector funds;   and

• the rate at which rollover funds will become relatively less important as a result of essentially the same services being available through ordinary superannuation funds.

The main uses of RIMGROUP are to distinguish between the implications of various policies, including the analysis of distributional consequences and assessing the robustness of the differences between policies to reasonable differences in key parameter settings, rather than make such asset projections. The projections are presented here in the light of the clear interest shown in such output when previously published by the Task Force (Rothman & Bacon, 1994, Rothman 1996, 1997, 1998). The RIM figure published in July 1996 was $373b, compared with the figure of $397b in July 1998, and our revised figure of about $426b in the Table below reflecting recent exceptional investment performance.   As stated in the paper, employer contributions have been in line with reasonable expectations and member contributions have exceeded expectations.

	Public DB funds	Private DB funds	Private DC funds	Total SG funds	Personal & rollover funds	Self employed	Grand Total all funds	Grand Total all funds
	$M - Current prices	$M - Current prices	$M - Current prices	$M - Current prices	$M - Current prices	$M - Current prices	$M - Current prices	Per cent of GDP
at June								
2000	$90,336	$79,193	$50,053	$56,416	$63,482	$32,855	$426,002	68.7%
2005	$123,279	$110,847	$77,384	$109,092	$91,672	$40,076	$643,232	82.2%
2010	$162,821	$153,159	$115,356	$181,177	$119,643	$46,845	$931,211	95.6%
2015	$206,158	$203,471	$163,122	$271,518	$149,790	$53,123	$1,280,090	107.0%
2020	$254,234	$262,283	$221,565	$380,689	$181,449	$59,967	$1,699,344	116.5%

Over the medium term these figures are similar to that published by the AMP that suggests an aggregate figure of over $400b by the turn of the century.   They remain much lower than recent projections by Rice Kachor and the National Bank.

The outstanding distributional pattern of the trends in the above table is the growth of SG accounts from their current level of about 13 per cent of total superannuation assets to about 22.5 per cent in 2020.

The RIMGROUP MODEL

RIMGROUP is a comprehensive cohort   projection model of the Australian population which starts with a population and labour force model, tracks the accumulation of superannuation in a specified set of account types, estimates non superannuation savings, and calculates tax payments and expenditures, social security payments including pensions and the generation of other retirement incomes.

These projections are done for each year of the projection period *separately for each birthyear gender decile cohort*.   The model projections begin in July 1992. Aggregate modelling based on RIMGROUP has been of policy significance eg in Gallagher (1995) and Rothman (1996, 1997, 1998).

More details of the RIMGROUP model are given in Rothman (1997) and Gallagher (1995).

Strengths and Limitations

The strengths of RIMGROUP lie in:

- The major new parameter research underlying the model in relation to many distributional aspects of superannuation, non superannuation savings, labour force dynamics and retirement documented in earlier papers (including Bacon (1994, 1995, 1996); Brown (1994, 1996); and Rothman (1995 a-d)).   Research has been carried out on superannuation sectors not previously extensively researched, such as the public sector, self employed and rollover funds.   An extensive set of decrements have also been researched to account for losses on job change, disability, hardship and death as well as retirement.   A number of significant new data sets have been created as part of this research.

- The comprehensiveness of the model.   This includes the integration into RIMGROUP of a full population model, labour force projection model, the endogenous calculation of GDP, an extensive study of retirement, coverage of saving other than superannuation and wide coverage of government payments to beneficiaries and pensioners, together with modelling of taxation, tax expenditures, and national savings.

- The detail incorporated into the model, particularly the strong distributional framework which distinguishes by superannuation account, age, income and gender. Taxation and government payments are also coded in considerable detail.   A wide range of distributional results are available as well as key aggregates.

- The very long time frame, to 2060 if required and appropriate.

- The facility to make changes in all underlying parameters and assumptions including the ability to make direct changes through a user friendly interface to the most frequently changed policy and economic parameter settings.

The principal limitations of RIMGROUP lie:

- in the essential nature of a group model.   The model is a very large one incorporating some 113,000 records, with thousands of variables calculated for each record and with subgroups formed for those with different superannuation accounts, different ages of retirement and so on. Nonetheless, it is not an individually based microsimulation and there is some necessary 'pooling' of work experiences, account balances, income levels and so on.   For example,

unemployment is viewed as a temporary phenomenon and superannuation accumulation is shared by those working and (temporarily) not working[5].   Similarly migrants are pooled with others in the model and may dilute the assets of the group they join;

- in macroeconomic linkages being externally imposed rather than endogenous to the model.   For example unemployment is exogenously supplied and does not respond automatically to the build up of superannuation or changing retirement rates or other aspects of the economy.   In this way it differs from the AMP model (Armstrong, 1996); and

- in some data which continue to be unavailable in the detail needed. The extensive and demanding data base continues to require further development, maintenance and fine tuning.

DEMOGRAPHY AND LABOUR FORCE

The base demographic scenario is essentially identical with Series II as published by the ABS (1998). The labour force scenarios have been generated specifically by the Task Force (see Bacon, 1995).

RETIREMENT

Retirement can be a complicated process whereby full time workers may pass through a period of part time work or become a discouraged job seeker before leaving the work force permanently. Operationally RIMGROUP is based on the concept of full retirement, defined as a person leaving the workforce and not re–entering it.   Despite some considerable data difficulties, retirement has been researched in detail by the RIM Unit, and a sub model called RETMOD constructed (see Bacon, (1996, 1997)) which provides annual projections of full retirement by gender, age and income decile.

Based on these retirement rates, RIMGROUP calculates the number of people retiring each year from each account type and the aggregate value and components of their retirement benefits categorised by the type of retirement (disability or age).

Additional to the basic grouping by gender age and income, 12 retirement subgroups are created depending on type of superannuation coverage and age range at retirement, as there are usually significant differences in retirement income and taxation for such subgroups.

Retirement benefits are then allocated for each sub group of retirees to six destinations.   These are:

- Eligible Termination payments (ETPs) dissipated with no impact on retirement income;

- ETPs invested in interest bearing accounts;

- ETPs invested in rollover accounts for those under 65;

- ETPs invested in shares or other assets with likely long term capital gains;

- Monies rolled over into allocated pension accounts; and

- Benefits taken as superannuation pensions or monies rolled over to a complying lifetime annuity. Since September 1998 the funds in this last destination have not been counted under the Social Security pension assets test.

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[5] But those permanently unable to work through disability are distinguished and treated separately.

The allocation can be specified by the user.

Numbers of Social security recipients and payments to them are projected by the model both in relation to unemployment and sickness benefits during working life and age and disability pensions upon retirement. Thresholds and withdrawal levels associated with Social Security income and asset tests are modelled in detail, with the user being able to specify the type of indexation to be applied to the tests and to base levels of payment.

PARAMETER STRUCTURE

Parameters which vary by many of the attributes of gender, age, decile and account type are generated as files in a standard format and input through a parameter integration program (which also sets up the basic 112880 records referred to above). It is expected that these parameters will be varied only infrequently by 'expert' users. Many other parameters of an economic or policy significant nature can be varied readily through a user friendly interface which handles variables which vary by time and/or account type. Examples of variables that can be input through the interface include the returns of various superannuation accounts and retirement investment, rates of compulsory SG contributions, inflation, rates of increase in average weekly earnings, various social security and taxation rates and the mode of indexation to apply to them.

BASE PARAMETER SETTINGS

These are adjusted to historical rates, with a gradual transition to the following long term settings:

- 2.5% per annum for inflation;

- 3.75% pa for growth of average wages for a person of given age and gender [6];

- 6% pa for the long term bond rate;

- 7% pa for the average pre-tax return of superannuation funds (after expenses of managing funds but before tax- administrative expenses are deducted separately on a per capita basis); and

- effective tax rates on the earnings of superannuation funds of 3% for defined benefit funds, 4% for established defined contribution funds, 5% for SG funds and 10% for rollover funds.

In RIMGROUP we differentiate between the annual returns for defined benefit funds, defined contribution funds, industry funds and rollover funds. Currently these differences are set at 0.5-1.5 percentage points, with the defined benefit schemes having the highest rates and rollovers the lowest.

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[6] The actual wage outcome is impacted by demographic and structural change such as the increasing proportion of work which is part time.

METHODOLOGY AND RESULTS OF HYPOTHETICAL ANALYSIS

THE SCENARIOS

The underlined individual cases are three males who start work at age 25 in 1997, and live to age 82. The age at death is based on projected life expectancies for men who will be aged 65 in 2036. The individuals are assumed to receive incomes of half times, once or twice Average Weekly Ordinary Times Earnings (AWOTE) throughout their working lives. These individuals are assumed to retire at age 60 and at age 65, and take retirement benefits as an Eligible Termination Payment (ETP), or 50 per cent ETP and 50 per cent lifetime pension/ annuity (these are not means tested for social security purposes), or 50 per cent ETP and 50 per cent allocated pension (such pensions are means tested for social security purposes). The results provided in Tables 1A-6A below give an indication of the effect of retiring earlier than age 65 and the impact of different investment strategies for taking superannuation benefits.

The individuals are then subject to periods of unemployment from age 30-34 or from age 40-44, or to a period of part time work (20 hours per week) from age 55-64. Unemployed individuals are assumed to access their superannuation under the hardship provisions[7] where sufficient superannuation has accrued to allow them to do so. People working part time cannot access their superannuation under the hardship provisions. In these cases individuals are assumed to retire at age 65 and take their benefits as 50 per cent ETP and 50 per cent lifetime pension or annuity. The results are presented in Tables 7A, 8A and 9A below and show the impact of an early and mid career period of unemployment as well as the impact of working part time in later years of working life.

We have also looked at a number of underlined hypothetical couples. A simplifying assumption is that couples are assumed to be born in the same year, to marry and both start work as employees in 1997 at age 25, and, in the case of the male, live to age 82 and the female to age 86. The ages at death are based on projected life expectancies for those who will be aged 65 in 2036.

Four types of couple are looked at, namely: a battler couple where both individuals receive incomes of 50 per cent of AWOTE throughout their time in the workforce, an upper middle income couple where both individuals receive incomes equal to AWOTE, a high income couple where both individuals receive incomes of twice AWOTE and a couple where the male receives income of twice AWOTE and the female income of 0.5 times AWOTE. These couples are assumed to retire at age 60 and at age 65, and take retirement benefits as an Eligible Termination Payment (ETP), or 50 per cent ETP and 50 per cent lifetime pension/ annuity (these are not means tested for social security purposes), or 50 per cent ETP and 50 per cent allocated pension (such pensions are means tested for social security purposes). The results in Tables 10A-15A below indicate the effect on retirement incomes of

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[7] Preservation in the superannuation system effectively requires that certain benefits must remain in the superannuation system until retirement of a member on or after preservation age (currently age 55 but being gradually raised to 60 for those born after 1 July 1964) or satisfaction of several other (limited) conditions of release. The rules in cases of financial hardship for those less than preservation age are that, in each 12 month period a single lump sum of between $1,000 and $10,000 may be paid, provided the person is receiving Commonwealth income support and has done so for a continuous period of 26 weeks and the person is unable to meet reasonable and immediate family living expenses. Where the amount of the person's preserved benefits and restricted non-preserved benefits is less than $1,000 a lesser sum may be taken.

While this may make a significant difference to individual's retirement income outcomes, in aggregate the amounts leaving the superannuation system under these arrangements are small compared with the overall size of the system.

retiring earlier than age 65 and applying different investment strategies to the accrued superannuation benefit.

We have then assumed different scenarios namely where the female member of the couple works full time throughout and the male member of the couple experiences a period of unemployment from age 30-34 or from age 40-44 or to a period of part time work (20 hours per week) from age 55-retirement at age 65. (In these cases the unemployed individuals are assumed not to access their superannuation under the hardship provisions. This is because their partner is still in employment and in the higher income cases at least they would not be eligible for social security payments.)

In the last scenario we assume that the female member of the couple leaves the workforce for child rearing purposes from age 28 to age 32, works part time from age 33 to 37 and resumes full time work at age 38. In all these cases individuals are assumed to retire at age 65 and take their benefits as 50 per cent ETP and 50 per cent lifetime pension or annuity. The results are presented in Tables 16A-18A of Attachment C and show the impact of an early or mid career period of unemployment as well as the impact of working part time in later years of working life. The results also show the impact of a period of withdrawal from the workforce early on for the purposes of child rearing, combined with part time work in mid career.

THE RESULTS

Singles

Table 1A Single Person Retiring at Age 65 and Receiving 100 Per Cent ETP with annuity drawdown

SALARY - as multiple of AWOTE	ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS - (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	(a)	(b)	(c)	(d)	(e)
0.5	166%	107%	128%	64%	96%
1.0	206%	76%	91%	37%	71%
2.0	274%	57%	69%	21%	34%

Table 2A Single Person Retiring at Age 60 and Receiving 100 Per Cent ETP with annuity drawdown

SALARY - as multiple of AWOTE	ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS - (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	(a)	(b)	(c)	(d)	(e)

0.5	144%	95%	111%	66%	95%
1.0	165%	62%	73%	38%	73%
2.0	214%	46%	54%	21%	50%

Table 3A Single Person Retiring at Age 65 and Receiving 50 Per Cent ETP and 50 Per Cent Life Pension

SALARY - as multiple of AWOTE	ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS - (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	(a)	(b)	(c)	(d)	(e)
0.5	163%	105%	126%	64%	98%
1.0	214%	79%	94%	37%	84%
2.0	289%	61%	73%	21%	60%

Table 4A Single Person Retiring at Age 60 and Receiving 50 Per Cent ETP and 50 Per Cent Life Pension

SALARY - as multiple of AWOTE	ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS - (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	(a)	(b)	(c)	(d)	(e)
0.5	144%	95%	111%	66%	97%
1.0	178%	67%	78%	38%	86%
2.0	224%	48%	56%	21%	59%

Table 5A Single Person Retiring at Age 65 and Receiving 50 Per Cent ETP and 50 Per Cent Alloc. Pension

SALARY - as multiple of AWOTE	ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS - (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	(a)	(b)	(c)	(d)	(e)
0.5	164%	105%	126%	64%	96%
1.0	207%	76%	91%	37%	65%

2.0	278%	58%	70%	21%	30%

Table 6A Single Person Retiring at Age 60 and Receiving 50 Per Cent ETP and 50 Per Cent Alloc. Pension

SALARY - as multiple of AWOTE	ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS - (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	(a)	(b)	(c)	(d)	(e)
0.5	143%	94%	110%	66%	96%
1.0	166%	63%	73%	38%	72%
2.0	217%	47%	55%	21%	46%

Table 7A Single Person Retiring at Age 65 and Receiving 50 Per Cent ETP and 50 Per Cent Life Pension Period of Unemployment from Age 30-34   (Superannuation Taken under Hardship Provisions for up to 5 years)

SALARY - as multiple of AWOTE	ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS - (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	(a)	(b)	(c)	(d)	(e)
0.5	146%	94%	118%	64%	100%
1.0	181%	67%	86%	37%	93%
2.0	235%	49%	64%	21%	79%

Table 8A Single Person Retiring at Age 65 and Receiving 50 Per Cent ETP and 50 Per Cent Life Pension Period of Unemployment from Age 40-44   (Superannuation Taken under Hardship Provisions for up to 5 years)

SALARY - as multiple of AWOTE	ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS - (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	(a)	(b)	(c)	(d)	(e)
0.5	125%	80%	100%	64%	100%
1.0	173%	63%	83%	37%	95%

2.0	241%	51%	68%	21%	77%

Table 9A Single Person Retiring at Age 65 and Receiving 50 Per Cent ETP and 50 Per Cent Life Pension Period of Part Time Employment from Age 55-64 (No Superannuation taken under Hardship provisions)

SALARY - as multiple of AWOTE	ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS - (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	(a)	(b)	(c)	(d)	(e)
0.5	160%	103%	138%	105%	98%
1.0	208%	76%	102%	58%	86%
2.0	279%	58%	78%	33%	64%

Couples

Table 10A Combined Results for Couple Retiring at Age 65 and Receiving 100 Per Cent ETP with annuity drawdown

SALARY - as multiple of AWOTE		ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS – (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	Female	(a)	(b)	(c)	(d)	(e)
0.5	0.5	168%	93%	112%	55%	90%
1.0	1.0	201%	64%	76%	32%	49%
2.0	2.0	280%	51%	61%	18%	18%
2.0	0.5	215%	71%	86%	39%	39%

Table 11A Couple Retiring at Age 60 and Receiving 100 Per Cent ETP with annuity drawdown

SALARY - as multiple of AWOTE		ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS – (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	Female	(a)	(b)	(c)	(d)	(e)
0.5	0.5	136%	77%	90%	56%	80%
1.0	1.0	171%	55%	64%	32%	65%
2.0	2.0	220%	40%	47%	18%	34%
2.0	0.5	180%	61%	72%	40%	58%

Table 12A Couple Retiring at Age 65 and Receiving 50 Per Cent ETP and 50 Per Cent Life Pension

SALARY - as multiple of AWOTE		ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS – (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	Female	(a)	(b)	(c)	(d)	(e)
0.5	0.5	167%	93%	111%	55%	95%
1.0	1.0	219%	69%	83%	32%	78%
2.0	2.0	295%	53%	64%	18%	41%
2.0	0.5	234%	79%	94%	39%	72%

Table 13A Couple Retiring at Age 60 and Receiving 50 Per Cent ETP and 50 Per Cent Life Pension

SALARY - as multiple of AWOTE		ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS – (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	Female	(a)	(b)	(c)	(d)	(e)
0.5	0.5	148%	83%	98%	56%	96%
1.0	1.0	175%	56%	66%	32%	71%
2.0	2.0	235%	43%	51%	18%	54%
2.0	0.5	186%	64%	75%	40%	68%

Table 14A Couple Retiring at Age 65 and Receiving 50 Per Cent ETP and 50 Per Cent Allocated Pension

SALARY - as multiple of AWOTE		ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS – (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	Female	(a)	(b)	(c)	(d)	(e)
0.5	0.5	166%	92%	110%	55%	89%
1.0	1.0	206%	65%	78%	32%	50%
2.0	2.0	296%	53%	64%	18%	25%
2.0	0.5	219%	70%	84%	39%	43%

Table 15A Couple Retiring at Age 60 and Receiving 50 Per Cent ETP and 50 Per Cent Allocated Pension

SALARY - as multiple of AWOTE		ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS – (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	Female	(a)	(b)	(c)	(d)	(e)
0.5	0.5	134%	75%	88%	56%	80%
1.0	1.0	173%	56%	65%	32%	64%
2.0	2.0	227%	42%	49%	18%	36%
2.0	0.5	181%	60%	70%	40%	59%

Table 16A Couple Retiring at Age 65 and Receiving 50 Per Cent ETP and 50 Per Cent Life Pension

Male Unemployed from Age 30-34, No Superannuation Taken under Hardship Provisions as Female Partner Works Full Time Throughout

SALARY - as multiple of AWOTE		ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS – (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	Female	(a)	(b)	(c)	(d)	(e)
0.5	0.5	163%	90%	111%	55%	97%
1.0	1.0	211%	67%	83%	32%	81%
2.0	2.0	280%	51%	63%	18%	48%
2.0	0.5	219%	76%	94%	39%	79%

Table 17A Couple Retiring at Age 65 and Receiving 50 Per Cent ETP and 50 Per Cent Life Pension

Male Unemployed from Age 40-44, No Superannuation Taken Under Hardship Provisions as Female Partner Works Full Time Throughout

SALARY - as multiple of AWOTE		ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS – (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	Female	(a)	(b)	(c)	(d)	(e)
0.5	0.5	164%	91%	114%	55%	96%
1.0	1.0	213%	67%	85%	32%	80%
2.0	2.0	284%	51%	65%	18%	46%
2.0	0.5	222%	77%	95%	39%	77%

Table 18A Couple Retiring at Age 65 and Receiving 50 Per Cent ETP and 50 Per Cent Life Pension

Male Works Part Time From Age 55-64, Cannot take Superannuation under Hardship Provisions, Female Works Full Time Throughout

SALARY - as multiple of AWOTE		ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS – (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	Female	(a)	(b)	(c)	(d)	(e)
0.5	0.5	166%	92%	116%	71%	96%
1.0	1.0	216%	68%	86%	40%	79%
2.0	2.0	290%	52%	66%	23%	43%
2.0	0.5	229%	78%	96%	44%	74%

Table 19A Couple Retiring at Age 65 and Receiving 50 Per Cent ETP and 50 Per Cent Life Pension

Female Leaves Work Force from Age 28-32, Works Part Time from Age 33-37, No Superannuation Hardship Provisions are Accessed, Male Works Full Time Throughout

SALARY - as multiple of AWOTE		ADEQUACY – (a) Ratio of Average Annual Net Expenditure in Retirement to Average Full Rate DSS Retirement Payments	REPLACEMENT RATES – (b) Ratio of Average Annual Net Expenditure in Retirement to Final Working Year Net Salary (c) Ratio of Average Annual Net Expenditure in Retirement to Average Working Life Net Salary		DSS RETIREMENT PAYMENTS – (d) Ratio of Full Rate DSS retirement payments to Final Working Year Net Salary (e) Proportion of Full Rate DSS Payments Received in Retirement	
Male	Female	(a)	(b)	(c)	(d)	(e)
0.5	0.5	161%	89%	116%	55%	97%
1.0	1.0	207%	65%	86%	32%	83%
2.0	2.0	275%	50%	65%	18%	51%
2.0	0.5	228%	75%	100%	39%	75%