RETIREMENT INCOME MODELLING UNIT

PROJECTIONS of KEY AGGREGATES

For AUSTRALIA'S AGED -

GOVERNMENT OUTLAYS, FINANCIAL ASSETS and INCOMES

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The RIM Unit is now a part of the Treasury. It is the successor to The RIM Task Force which was jointly sponsored by the Commonwealth Departments of the Treasury, Finance and Social Security.

I would like to thank my colleagues of the RIM Unit for advice and assistance. The views expressed in this paper are those of the Author and do not necessarily reflect the views of the RIM Unit, the Treasury or the Government.

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Abstract

RIMGROUP is a comprehensive cohort based lifetime model developed by the Retirement Income Modelling Unit. This paper uses the RIMGROUP model and its key outputs to project both medium term and long term aggregates for Australia's aged.

Overall, over the medium term the current fit with administrative data and forward estimates seems very adequate, with RIMGROUP slightly overestimating age and veterans pension costs by an average 0.5% and underestimating numbers by an average of 0.2%; the model therefore seems to be at a suitable stage for analysing medium term retirement policy differences. However it should be noted that the growth of pensioner numbers and the relative number of full and part pensioners is *very sensitive* to the exact values by gender and decile allocated to initial asset values, the levels of non superannuation assets upon retirement and drawdown patterns. A considerable amount of adjustment was needed to achieve the degree of fit shown in the paper.

Based on RIMGROUP analysis over the long term to 2050, the costs of aged and veterans pensions will rise as a proportion of GDP to about 4.5% of GDP. In isolation, the base case may well be affordable constituting an increase of about 1.5 percentage points of GDP in the very long term, say $8b in today's terms. A universal pension, however, would constitute a rise of about 3.5 percentage points of GDP above the current base case and this is likely to be prohibitively costly. A scenario where the full age pension rises from its current benchmark of 25% of average male wages to 30%, would generate a rise in outlays of about 2.3 percentage points of GDP in the long term above the current base case.

Sensitivity studies show that pension costs are quite responsive to the level of funds dissipated (not invested in income producing assets) and drawdown patterns in retirement. Aggregate pension costs may be about 10% higher than the base case if both dissipation levels and drawdown rates are high.

Projections of the aggregate long term cost of Health in Australia are provided which illustrate the potential of RIMGROUP to provide a useful analysis tool for a range of longer term studies, drawing inter alia on the strength of the population, labour force and GDP projections. If the long term rise in Health costs *per person in a given age group* can be held to 1% above inflation, the rise in Health costs in percentage points of GDP is comparable to the rise in Age and Veterans Pension costs. If recent trends prevail, the rise in aggregate Health costs for Australia may exceed 8 percentage points of GDP, which would clearly require a substantial change in fiscal and/or health funding arrangements.

The views expressed in this paper are those of the Author and do not necessarily reflect the views of the RIM Unit, the Treasury or the Government. The Author would be pleased to discuss aspects of this paper and can be contacted at the above address, email grothman @ treasury.gov.au or phone 02-62633947.

PROJECTIONS of KEY AGGREGATES

For AUSTRALIA'S AGED RETIREES-

GOVERNMENT OUTLAYS, FINANCIAL ASSETS AND INCOMES

INTRODUCTION

The basic picture that Australia's population is ageing and this will bring pressures on government outlays over the longer term is well known and documented. That said the debate remains quite an open one, with some groups believing the age pension will not survive, some believing the health care system will cope easily and others taking a fully contrary view that government funded health care will disappear under the pressure. This is despite some good contributions to the debate such as those provided by EPAC and the Commission of Audit (EPAC, 1994; Commission of Audit 1996).

This paper seeks to add value to the consideration of these issues by utilising the substantial investment in developing the code and parameters for the RIMGROUP model to project both medium term and long term aggregates for Australia's aged. These projections include dependency ratios, the costs of aged and veterans pensions, the aggregate assets of the aged compared with the aggregate assets of the superannuation system, and the projected costs of health care in Australia. Some sensitivity analysis is provided to indicate reasonable ranges of uncertainty about the base results.

Additionally, reflecting public interest in such matters, new RIMGROUP based summary projections of superannuation asset levels in Australia are provided which incorporate recent budget decisions and recent investment experience.

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. Developing RIMGROUP has been a major project of the Retirement Income Modelling Task Force and contributed to by all members of the Task Force.

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. The RIMGROUP model extends the task force's aggregate modelling capability which until 1996 relied upon its enhanced version of the RIP model. Such aggregate modelling has been of policy significance and the results have been reported earlier and at this Colloquium including in FitzGerald (1993), Gallagher et al (1993), Rothman and Bacon (1994), RIM Task Force (1994), Gallagher (1995), Rothman (1996,1997)

More details of the RIMGROUP model are given in Rothman (1997), and Gallagher (1995). Attachment A sets out briefly the current set of economic parameters used.

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, 1996a-b,; Brown 1994,1996; 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 including 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. This comprehensiveness means that RIMGROUP can serve as a framework for other medium longer term modelling such as projecting dependency ratios and the longer term costs of the health system (see below).

- 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 113000 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[1]. 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 (AMP, 1996); and
- in some data which continue to be unavailable in the detail needed. Even though extensive research and some commissioning of new data has been undertaken, the extensive and demanding data base requires further development, maintenance and fine tuning.

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

OUR APPROACH TO MODELLING AGGREGATES FOR THE AGED

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, 1996a, 1997) which provides annual projections of full retirement by gender, age and income decile.

Retirement Incomes

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). Retirees are grouped by:

- whether a person was a member of a public sector defined benefit superannuation scheme, whether the person's benefit originated from one of the other account types or whether the person belongs to a group with no superannuation throughout their working life; and

- by the age at which the person retires. There are 4 subgroups of retirees:

  - those retiring before 55;
  - those retiring from age 55 to age 59;
  - those retiring from age 60 to age 64; and
  - those retiring at age 65 or later

Additional to the basic grouping by gender age and income, subgroups are created for the above categories, as there are usually significant differences in retirement income and taxation for the 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 rollover complying annuity.

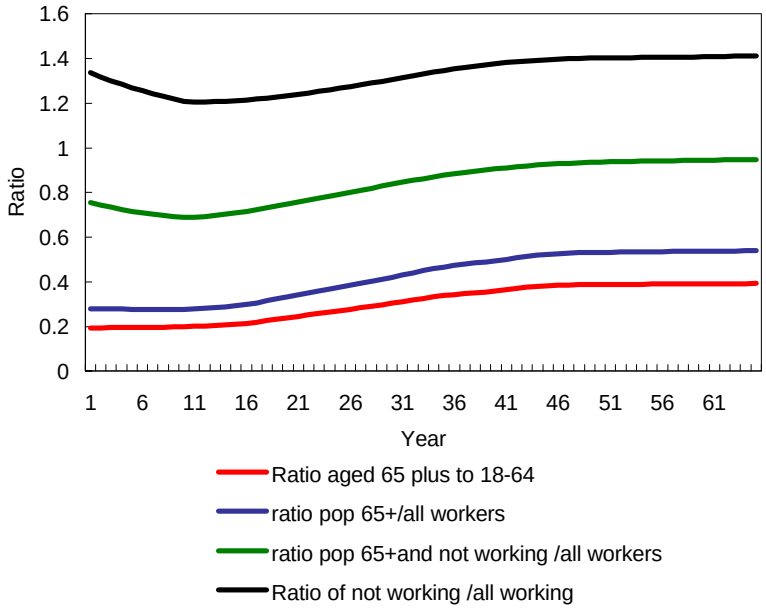
The allocation can be specified by the user.

Social Security Payments

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.

SETTING THE SCENE: DEPENDENCY RATIOS

Many papers have alluded to Australia's Ageing Society and the possible ramifications – the EPAC analysis (EPAC, 1994) remains a good summary starting point. The RIMGROUP model can be used to set the context of these issues through the projection of a number of dependency ratios –some of them representing a useful extension of the simple ratios normally used.



The first projection (ratio 1 in Graph 1) is the standard age dependency ratio, which is defined as the ratio of the population aged over 65 to the population aged 18-64 ie to the population of 'working age'. This series increases steadily from a ratio of 0.19 in 1994-95 to 0.2 in 2005-06, 0.3 in 2024-25 and rises to 0.39 in 2059-60. These increases are very substantial given the high cost to government of services to the aged.

The second projection extends the concepts of the first projection by considering the ratio of those aged over 65 to the number of actual workers, not just those persons in the working age range. The denominator includes all workers whether aged below or above 65[2]. The value in 1994-95 of this ratio is about 0.28 and drops slightly remaining around this figure up to the year 2006 before rising to 0.42 in 2024-25 and 0.54 in 2059-60. The reason for the difference in the pattern of this ratio compared with the first ratio is the very substantial rise in labour force participation underlying the RIM projections which is incorporated in this ratio, but not in the first ratio considered. A possible policy implication of this is that this expected rise in labour force participation may provide a window of up to ten years before increasing dependency issues start to bite.

The third ratio considers a broader concept of dependency and we add into the numerator of ratio 2 those not working in the age range 18-64 (to those aged over 65). Considering this ratio again as a

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[2] A suggestion was made that the denominator of the number of workers could be corrected for the fact that not all workers are the same - specifically for the increasing proportion of part time workers and the changing age structure of the workers. This was examined but the two trends counteract each other and there is no significant difference in the derived dependency ratios.

proportion of all workers, the ratio actually drops from about 0.77 now to 0.69 in 2005 before rising again to about 0.84 in 2024-25 and eventually rising to about 0.95 at the end of the projection. The forces driving this projection are essentially the same as those driving the second ratio but the increasing proportion of workers has an even greater effect as it both decreases the numerator and increases the denominator. The possible policy implications are similar to those of ratio two.

A fourth possible projection of dependency ratios considers in the numerator all those not working of whatever age over a denominator of all those working. Similarly to ratios two and three this shows a drop over the period to 2005 dropping from a current value of about 1.36 to 1.2 before rising again to 1.3 in the year 2024-25 and 1.4 at the end of the projection period. Again this ratio has responded to the assumed substantial increase in labour force participation over the next ten years but also responds to the changing numbers of young people under working age which in turn reflects assumptions about trends in fertility.

In considering the policy implications of ratios 3 and 4, it should be noted that in these ratios the dependent aged have been added together with the dependent young without weighting. Yet it is well established that the cost to government of an aged person considerably exceeds the cost to government of a young person, the relevant cost ratios being that an aged person costs all governments 2.3 times the cost of a young person and for the Commonwealth Government the ratio is 4.1 (see Gallagher 95).

Ratio 2 is considered to be the best starting guide to the issues in this paper with ratio 3 of some relevance.

REVIEW and BENCHMARKING OF MEDIUM TERM PROJECTIONS

A large study was undertaken as part of determining the initial distribution of assets and income of the aged, and their asset allocations at retirement required for setting up the start of the RIMGROUP model; results of this work are set out in Brown, 1996. A review and further benchmarking since then has resulted in further changes to the code and parameter sets as follows:

1. Assets

The current allocation has had regard to new data based on the Income Distribution Survey and a new 1995-96 tax file (see Tinnion, 1998), adjusted to give an approximately correct distribution of part and full rate pensioners. The resulting distribution gives a better fit to aggregates than before, but is still approximate in the sense that these assets are in part being used as a proxy for the generation of certain incomes which are not included in the model: in particular, RIMGROUP does not currently cover the income of the working spouses of retirees nor income from overseas pensions.

RIMGROUP assigns somewhat higher assets to lower and middle deciles as this seems necessary to get even approximately the right balance of part and full pensioners (in the absence of these other sources of income).

2. Younger Women

The previous RIMGROUP version gave an age pension to too many women between the current age pension eligibility age and age 65, lining up poorly with the administrative data. Presumably this was because the model failed to reflect other assessable income for these women- their own part time work income or importantly because of their husband continuing to work. This has been adjusted by a relatively crude factor to reduce numbers eligible to allow for these other sources of income.

3. Choice of Retirement Investments

An earlier version of the model had an identical investment pattern for all deciles, ages, both genders and for the private and public sectors, with the available decile age and gender variation provided through the parameter integration (based on DSS data) not being used. Currently a mix of the parameter integration data and imposed values is being used (as the DSS based parameter integration data does not cover all the aged and does not reflect the rapid growth of allocated pensions nor accurately specify the extent of (unfunded) superannuation pensions in the public sector).

4. Drawdown of Investments in Retirement

Similarly an earlier version of the model had an identical drawdown pattern in retirement for all deciles, ages , both genders and for the private and public sectors. This meant that the drawdowns were too high for the lower deciles, leading to too high pensions over time as these deciles used up their assets, and too low drawdowns for high deciles, apparently leading to artificially low retirement expenditures for these deciles compared with the lower ones. This has been corrected in part but some uncertainty remains in this respect as good data (of a longitudinal kind) is very hard to acquire.

Benchmarking

Detailed Tables setting out the current extent of alignment of RIMGROUP with the administrative data, including forward estimates, are in Attachment B. The Tables compare the aggregate payments to aged and veterans pensioners and pensioner numbers estimated in RIMGROUP with the administrative data, comprising both actual outcomes and forward estimates. The proportions of full and part time pensioners separately for men and women in RIMGROUP are also compared with the administrative data.

Overall Attachment B shows that the current fit with administrative data and forward estimates appears to be very adequate, with RIMGROUP slightly overestimating pension costs by only an average 0.5% and underestimating numbers by an average of 0.2%. The model therefore seems to be at a suitable stage for analysing retirement policy differences. If it were to be used as a shorter term forecasting method, it would be important to make adjustments (probably in a spreadsheet) for the inability of RIMGROUP to reproduce the exact timing of the increases in age pension age for women, as in the current version of the model we can only change age pension eligibility in whole years.

While degree of fit may appear satisfactory, it should be noted that the growth of pensioner numbers is *very sensitive* to the exact values allocated to initial asset values, the levels of non superannuation assets upon retirement and drawdown patterns by gender and decile. A considerable amount of adjustment was needed to achieve the degree of fit shown above. Similarly the relative number of full and part pensioners is very sensitive to the exact values allocated for these parameters. However the amount of pension paid is less sensitive, as much of the sensitivity arises from the numbers of marginal part pensioners (compared with no pension at all) or from persons on the margin of getting a full pension.

Another factor in the current benchmarking is the *substantial reduction* in the bond rate over the period with returns and deeming rates both *responding immediately* to the change in bond rate. This creates the situation where the number of pensioners tends to grow because of factors outside of the demographic and retirement decision processes and makes it harder to achieve very good alignment with the forward estimates which seem to be based on trend projections rather than specifically adjusted for changing rates of return.

LONG TERM BASE RESULTS

A major issue associated with the well documented demographic pressures the ageing population may place on the public purse is the long term costs of age and veterans pensions, given different policy settings. Related issues are the sustainability of paying age pensions to most of the aged, the impact of compulsory superannuation, the proportion of aged that is expected to receive some pension and the related politics of the size of the age pension, as the number of voters receiving the pension either becomes very large or, in some people's expectations, quite small.

Central RIMGROUP projections relevant to these issues are set out in Table 4 below. The base RIMGROUP scenario is the continuation of voluntary superannuation saving and the Superannuation Guarantee (SG), with pensions indexed to AWOTE, but with threshold levels for income and assets tests indexed to CPI. Also essential to Table 4 is the endogenous calculation of GDP within RIMGROUP. Because it is based on very detailed population and labour force projections which are fully consistent with the shorter ABS projections, RIMGROUP can be used to project GDP on the basis of assumptions that GDP growth is equal to productivity growth (per hour worked) plus labour force growth and that, at constant unemployment, the wages share of GDP remains constant over the projection period (Okun's Law).

Table 4 Projected Cost of Age and Veterans Pensions as percentage of GDP

		Various scenarios									
year				base		without SG		Universal pension		30 pc pension	
1998	-	1999		2.99		2.99		3.68		2.99	
1999	-	2000		2.94		2.94		3.61		3.45	
2000	-	2001		2.94		2.94		3.62		3.45	
2010	-	2011		3.06		3.08		3.81		3.61	
2020	-	2021		3.55		3.67		4.72		4.22	
2030	-	2031		4.07		4.33		5.79		4.86	
2040	-	2041		4.49		4.76		6.38		5.33	
2049	-	2050		4.48		4.76		6.44		5.32	

It is clear from this Table that, based on RIMGROUP analysis, the costs of aged and veterans pensions will rise as a proportion of GDP. In isolation, the base case may well be affordable constituting a 1.5% of GDP increase in the very long term , say $8b in today's terms. A universal pension however constitutes a rise of almost 3.5% of GDP above the current base case and this is

likely to be prohibitive. A scenario where, say, voting pressure causes a rise in the full age pension from its current benchmark of 25% of average male wages to 30% causes a rise of about 2.3% of GDP in the long term above the current base case, which might well constitute an affordability problem. Further consideration of such issues is best deferred until after considering the fiscal pressures of Health costs later in this paper.

SENSITIVITY ISSUES

The above Table makes the point that the basic policy settings of the government pension are of major significance. It is perhaps not quite so obvious that other parameters of the system can also be very important to the aggregate result such as:

- the level of dissipation of lifetime savings (ie after tax monies used for purposes other than financial investment);

- the rate of drawdown of the capital component of investments and the consequent level of bequests. It is well known by many persons involved with aged persons that many retirees wish to live on the nominal interest flowing from their assets and not draw down the capital in an annuity pattern, while in fact the annuity pattern is desirable if the system is to achieve the best increase in retirement expenditure and standard of living.

- Changing patterns of retirement over time, whether in response to government policies such as the new pensioner bonus which encourages longer attachment to the full time workforce, or legislation that prohibits compulsory retirement or the changing nature of the workforce as the population ages.

- The deeming rate policy whereby, for many investments, the income flows that count towards Social Security income tests are deemed flows at standard rates (currently 3 and 5 percent of the capital) rather than the actual income flows received.

- Investment patterns and investment mix. How much of the after tax capital available for investment by a typical retiree goes into annuities, allocated pensions, fixed interest or capital gains type investments such as shares and investment housing and how does this investment mix vary by income. Brown, 1996 and Tinnion, 1998 show that a key feature of the current situation is the very high proportion of financial assets invested in fixed interest, although it is well known that shares and allocated pensions are clearly gaining in popularity. Changes in policy, such as the assets tests rules in relation to complying income streams products, can clearly influence this and change aggregate pension costs.

Questions on the relative significance of such factors can be addressed by sensitivity studies using the RIMGROUP model and some results are set out in Table 5 below.

Table 5 Projected Base Cost of Age and Veterans Pensions in $M of that year and sensitivity variations as percentage of base

year			base pension payment $m	high dissipation	annuity drawdown	higher retirement rate
1998	-	1999	$17,140	0.00%	0.11%	0.00%
1999	-	2000	$17,720	0.05%	0.20%	0.02%
2000	-	2001	$18,584	0.11%	0.29%	0.06%
2001	-	2002	$19,528	0.21%	0.36%	0.13%
2002	-	2003	$20,537	0.32%	0.45%	0.22%
2003	-	2004	$21,167	0.43%	0.56%	0.26%
2004	-	2005	$22,283	0.57%	0.71%	0.38%
	-					
2009	-	2010	$28,309	1.55%	1.59%	0.76%
	-					
2014	-	2015	$36,986	2.81%	3.10%	0.99%
	-					
2019	-	2020	$49,174	3.84%	5.10%	0.96%

Clearly the sensitivity analysis shown should be seen only as indicative as the extent of variation from the base case is a matter of judgement. For example the dissipation case shown assumes dissipation of between $20000 each (indexed) for the bottom decile to $60000 for the top decile whereas the base case assumes maximum average dissipation for the top decile is $25000. RIMGROUP also permits specification of dissipation at retirement as a percentage of accumulated funds.

We do not have good data on drawdown patterns and the table above suggests it is an important practical variable as well as of possible policy significance. The drawdown pattern is very influential in the proportion of pensioners who are full or part rate and to get even reasonable accord with benchmarking data I had to allocate very low drawdown rates in the base case. The example shown is where drawdown of fixed interest (the major investment for most people) follows an annuity pattern. ie if we can persuade, or require, retirees to use their accumulated funds for a better standard of living in retirement rather than for leaving a substantial bequest.

The base run assumes that the introduction of the pensioner bonus will reduce retirement rates by twenty percent for those retiring within three years of pensionable age; the sensitivity run returns the retirement rates to previous levels. While the impact on the pension will eventually be of significance as in a number of these sensitivity analyses, the pension cost is only a part of the picture: tax revenue for both working and retired groups will change, together with some labour force offset effects and consequential unemployment changes, as well as the direct cost of the pensioner bonus.

Comments

The variations, if they all happened together, represent an upwards risk of about 10% of the pension cost in 2019-20 (0.35% of GDP)[3], and somewhat more in the out years because most of the

[3] Long term costs as a proportion of GDP clearly also depend on the denominator – the endogenous projection of GDP. RIMGROUP allows the user to construct alternatives, for example by varying the long term labour productivity

percentage variations are growing; the variations apply to new retirees and the stock is only gradually turned over.

A key issue is the very moderate sensitivity of age pension costs to major policy changes such as the SG policy or changed preservation arrangements. A number of possible imperfections in the model were found earlier and modified, such as unreasonably high non superannuation assets allocated to some of those retiring, as this would make pensions paid independent of the superannuation assets of those retiring. However after addressing all such issues that we know about, the sensitivity remains relatively low.

To some extent this is not surprising:

- it takes a long time for (say, the SG) policy to make a substantial difference to the assets of those newly retiring;
- there are a lot of existing pensioners at any one time and it takes a long time to turn over the stock;
- any new additional assets change the pensions paid over the lifetime of the new retirees rather than immediately;
- the pension income test withdrawal rate is 50% (and not 100%);
- depending on the extent to which the policy is means tested, some of the impact of the policy may be on the top deciles who don't get a pension anyway, but their tax payments are affected.

This lack of policy sensitivity in pensions paid was a clear feature of earlier RIP analyses and it is interesting that it has continued into RIMGROUP despite the much greater income detail and benchmarking attention.

Comparison Of Assets Of The Aged With Assets In The Australian Superannuation System

The total assets of the Australian Superannuation system are currently about $317 billion and comprise the largest single financial asset class held by the household sector, easily exceeding, for example, deposits held with banks. The total financial assets held by the aged are currently about 40% of this level. The superannuation system is projected to continue to grow strongly, reaching $595 billion in June 2005 and $1580 billion in June 2020. (Because of continuing interest in such projections, updated figures are given in Attachment C.)

Initially the ratio of total assets held by the aged to total assets in the superannuation system is expected to drop to about 32% in 2008, before growing again to reach well over 70% by 2050.

Impact on Cohorts

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assumption from 1.25%, the current base value. The Health projections in a later Section of this paper illustrate how different views on long term productivity significantly affect the cost ratio projections.

To distinguish more clearly between the large existing stock of retirees and the new flow, we consider the group (or cohort) currently aged between 50 and 64 years old and what average superannuation pay out they will receive when retiring at a certain time. We also compare this with the average financial assets of the already retired and estimate the additional income that their payout can generate, both before and after any reduction because of the pension income test. The results of these projections, in constant 1997-98 dollars, are set out in Table 6 below:

Table 6 Outcomes for those retiring at different Times

YEAR			AV SUPER PAYOUT	RATIO PAYOUT TO AVERAGE FINANCIAL ASSETS OF RETIRED	ESTIMATED ANNUAL EXTRA INCOME	EXTRA INCOME AFTER REDUCTION OF PENSION	EXTRA INCOME AFTER PENSION and TAX REDUCTIONS
1997	-	1998	$52,241	0.9	$2,012	$2,012	$2,012
2000	-	2001	$69,484	1.2	$2,874	$2,737	$2,737
2005	-	2006	$93,083	1.3	$4,054	$3,327	$3,191
2010	-	2011	$115,051	1.3	$5,153	$3,876	$3,662
2015	-	2016	$216,281	1.9	$10,214	$6,407	$5,504

We see from the table that the amount paid out from the superannuation system rises sharply over the period, reflecting both the growth of the superannuation system and also the longer work experience (and accumulation) of those retiring later. Initially the pay out received is slightly less than the total average financial assets of the whole retired group, but later becomes about double this level. The additional income received is conservatively estimated by assuming that the pay out is invested at the deeming rates; in 1997-98 all this additional income is received without reduction on account of the pension test, because the amount is below the free area. Later in the projection period, the additional income becomes a very substantial supplement to the age pension, even after reductions because of the pension means test and income tax[4].

LONG TERM COSTS OF HEALTH

We have produced projections of health outlays consistent with our GDP projections, originally for a Government IDC and also for the Government's Commission of Audit, which published some of the results (Commission of Audit, 1996).

The RIM projections are of total public plus private health costs for the years 2031 and 2041. The methodology used is similar to that used by EPAC in its 1994 report on Australia's Ageing Society' (EPAC,1994). The basic methodology is to apply recent costs for a given age group to the projected numbers in that age group in the year in question, together with the assumed rate of increase in health costs above general inflation, **per person in each age group**.

[4] The exact additional income after pension reduction and tax will vary according to the investment choices at retirement, returns on the investments and the deeming rates.

The RIM projections differ from the EPAC projections in detail through:

- being based on a more up to date (ABS) population projection;
- being based on the RIM GDP projections which incorporate these population projections and new detailed labour force projections;
- splitting health costs, particularly for those over 75, into finer five year age groups[5]. The EPAC and Goss (Goss et al, 1994) projections lump together those aged over 75, but health costs are sensitive to exact age and it is in the group aged over 80 that the population growth over the projection period is greatest.
- in using recent trend data as the basis of the assumed annual growth in Health costs per person in a given age range **above inflation**:

  - a figure of 2% pa is used as the basis for the *high* projection, which aligns with the trend rate over the 10 years to 1994[6] (AIHW, 1994), (compared with 1 % pa assumed by EPAC which aligns with their assumption that health costs per person in a given age group will rise in line with the rising general wealth of the community as reflected in labour productivity[7]);
- calculating projected health costs as a proportion of GDP using a range of reasonable assumptions about labour productivity growth between 1 and 1.5% pa, with 1.25% considered the most reasonable figure.

The results are set out in Table 7 below:

[5] RIM use as the basis for this finer distribution the Commonwealth's health costs which are available on this more disaggregated basis.

[6] After allowing for the ageing of the population.

[7] For **the same assumptions** as EPAC the updated RIM figuring produces a result as a proportion of GDP materially the same as that derived by EPAC- both Health costs and GDP differ in detail but the ratio of one to the other is relatively robust.

Table 7 Projection of Total Health Costs in 2031 And 2041								
(Under Various Assumptions)								
				total cost 2031			**total cost 2041**	
				1 % pa increase	2 % pa increase		1 % pa increase	2 % pa increase
RIM est of Total Health costs				218367	323465		343400	559440
(in $ m, current prices)								
RIM est of Total Health costs				79530	117806		98229	160027
(in $ m, constant 89/90 prices)								
RIM est of GDP assuming			1% prod	2040491			2929804	
(in $ m, current prices)			1.25% prod	2235940			3290793	
			1.5% prod	2449556			3695201	
Health Costs as proportion of GDP			1% prod	10.7%	15.9%		11.7%	19.1%
			1.25% prod	9.8%	14.5%		10.4%	17.0%
			1.5% prod	8.9%	13.2%		9.3%	15.1%

The RIM projections which assume a 2% annual growth in Health costs above inflation provide a consistent and not unreasonable set which can be taken as the *high* scenario- they are high in the sense that they assume that neither policy actions nor technological change are effective in reducing recent trends in health costs per person of given age. The key results from this scenario are a range for **total** Health costs, both public and private, as a percentage of GDP in 2031 of 13 to 16% [8]; in constant dollar terms total Health costs in 2031 are projected to be $79.5 billion.

Within this same scenario there is further substantial growth by 2041, with total Health costs projected to lie in the range of 15 to 19 percent of GDP. If forced to use a single figure we would choose 17%, a full doubling in this ratio from the current position where Health costs are about 8.5% of GDP (AIHW,1998). The increase of 8.5 percentage points of GDP compares dramatically with the projected base case increase in pension costs of 1.5 percentage points. However it is important to note that while this represents the scale of the extra pressure on society as a whole, the Commonwealth's share of this is currently 45% [9](AIHW,1998), whereas of course the Commonwealth pays the full cost of age and veterans pensions.

If the rise in health costs per person in a given age group can be held to 1% above inflation, the rise in percentage points of GDP is much more comparable to the rise in Age and Veterans Pension costs.

[8] The range in the projections arise from the range of possible labour productivity growth rates.

[9] This proportion, while apparently stable over a 15 year span, has been rising in the 1990's.

CONCLUSIONS

RIMGROUP is a comprehensive cohort based lifetime model developed by the Retirement Income Modelling Unit. It has required a considerable time to set up and maintain. While the principal purpose of RIMGROUP is to facilitate advice on the impact of alternative policies, this paper has found the RIMGROUP model a useful framework to project both medium term and long term aggregates for Australia's aged.

A number of dependency ratios can help to give the potential scale of the longer term changes. The most relevant of these is the ratio of those aged over 65 to the number of all actual workers whether aged below or above 65. The value in 1994-95 of this ratio is about 0.28 and drops slightly remaining around this figure up to the year 2006 before rising to 0.42 in 2024-25 and 0.54 in 2059-60. The reason for the difference in the pattern of this ratio compared with a simple dependency ratio based solely on age is the very substantial rise in labour force participation underlying the RIM projections which is incorporated in this ratio, but not in a simple age based ratio. A possible policy implication of this is that the expected rise in labour force participation may provide a window of some seven to ten years before issues of increasing dependency start to bite.

Overall, over the medium term the current fit with administrative data and forward estimates on pension costs and numbers seems very adequate, with RIMGROUP slightly overestimating age and veterans pension costs by only an average 0.5% and underestimating numbers by an average of 0.2%. However it should be noted that the growth of pensioner numbers and the relative number of full and part pensioners is *very sensitive* to the exact values allocated to initial asset values, the levels of non superannuation assets upon retirement and drawdown patterns by gender and decile. A considerable amount of adjustment was needed to achieve the degree of fit shown in the paper.

Based on RIMGROUP analysis over the long term to 2050, the costs of aged and veterans pensions will clearly rise as a proportion of GDP to about 4.5% of GDP. In isolation, the base case may well be affordable, constituting an increase of 1.5% of GDP in the very long term, say $8b in today's terms. A universal pension however constitutes a rise of about 3.5% of GDP above the current base case and this is likely to be prohibitive. A scenario where, say, voting pressure causes a rise in the full age pension from its current benchmark of 25% of average male wages to 30% causes a rise of about 2.3% of GDP in the long term above the current base case, which may constitute an affordability problem.

Sensitivity studies show that aggregate pension costs are quite sensitive to the level of funds dissipated (not invested in income producing assets) and drawdown patterns in retirement and somewhat less so to retirement rates Aggregate pension costs may be about 10% higher if dissipation levels are high and drawdowns of assets in retirement are high. While encouraging sufficient asset drawdowns to maximise retirement expenditure is desirable from a policy viewpoint, it can be costly from the government's perspective.

Such aggregate studies do not clearly focus on the improving lot of new retirees as the new retirees are pooled with existing ones. Some cohort results presented show that amounts paid out from the superannuation system rise sharply over time, reflecting both the growth of the superannuation system and also the longer work experience (and accumulation) of those retiring later. Even after

reductions because of the pension means test and income tax, the additional income generated becomes a very substantial supplement to the age pension[10].

Besides being significant in their own right, the projections of the long term cost of Health in Australia illustrate the potential of RIMGROUP to provide a useful general analysis tool for a range of longer term studies, drawing inter alia on the strength of the population and labour force projections incorporated, the endogenous calculation of GDP, the extensive study of retirement, the inclusion of superannuation and other savings and the wide coverage of government payments to beneficiaries and pensioners, all within a strong distributional framework distinguishing by age, income and gender.

If the rise in health costs per person in a given age group can be held to 1% pa above inflation, the projected aggregate rise in the long term cost of Health in Australia in percentage points of GDP is comparable to the rise in Age and Veterans Pension costs. However, if recent trends prevail, the rise may exceed 8 percentage points of GDP which would clearly present a potential problem, even given that the Commonwealth's share of total national health costs is about 45%.

The difference in scale of the rise in health costs vis a vis pension costs is reasonably easy to understand in broad terms. The first point is that a pension costs much the same for an 85 year old as for a 65 year old[11]. On the other hand, health costs rise rapidly with age, and the group with the largest growth rate is expected to be those aged over 80. Secondly we have taken a view that pension costs for an individual will rise along with the standard of living of the country ie in line with wages. Wages incorporate an implied productivity growth which we take as 1.25% pa for our central case. The higher health scenario uses a historical rate of rise in health costs above inflation for a given type of person as 2% pa, which considerably exceeds our assumed long term rise in productivity.

Additionally in Attachment C this paper has provided updated summary projections of Australian superannuation assets which incorporate the policy decisions of recent budgets and recent good investment experience. Superannuation asset levels are projected to reach $397b in June 2000, $860b in 2010 and $1580b in 2020. As a proportion of GDP, the projections rise significantly and steadily from about 60% now to about 112% of GDP in 2020. The principal distributional feature by account type is the rise of Superannuation Guarantee accounts which are projected to increase from around 12% of total superannuation assets now to 23% in 2020.

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[10] The exact additional income after pension reduction and tax will vary according to the investment choices at retirement, returns on the investments and the deeming rates.

[11] Except for differences because of asset drawdowns.

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ATTACHMENT A

RIMGROUP PARAMETERS

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 [12];
- 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.

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

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

ATTACHMENT B

BENCHMARKING AGE AND VETERANS PENSION OUTLAYS AND NUMBERS OVER THE MEDIUM TERM

The current extent of alignment of RIMGROUP with the administrative data including forward estimates is shown in the following three tables.

Table 1: Payments to age and vets pensioners

year	$m budget	$m rimgroup	% difference
1992-93	$12,978	$13,180	1.6%
1993-94	$14,129	$13,693	-3.1%
1994-95	$14,311	$14,534	1.6%
1995-96	$15,051	$15,275	1.5%
1996-97	$15,819	$15,842	0.1%
1997-98	$16,248	$16,338	0.6%
1998-99	$16,971	$17,140	1.0%
1999-00	$17,531	$17,720	1.1%

Table 1 above compares the aggregate payments to aged and veterans pensioners estimated in RIMGROUP with the administrative data, comprising both actual outcomes and forward estimates. The fit seems very good with RIMGROUP on average very slightly overestimating pension costs. This is not surprising given the lack of some income sources as noted in the previous section. A key point to note is that the two sets of estimates remain broadly parallel and there is no apparent divergence.

Table 2 below shows a similar comparison for pensioner numbers. The quality of fit is very good for aggregate numbers (averaging only 0.2 percent difference) and also showing a sensible tendency for the estimates to be a stable proportion of the RIMGROUP estimates for the total number of retired. The fit is particularly good considering that RIMGROUP, because it models age in whole years, cannot reproduce the exact timing of the increases in age pension age for women.

The proportion of part rate pensioners is very sensitive to the exact asset distribution and the levels of return on assets. The fit appears adequate in 1992-93 but the proportion of part raters drops sharply in RIMGROUP from 1996 onwards as interest rates start to drop and when the extended deeming code is brought into effect.

Table 2: total of aged & vets pensioner numbers

year	rimgroup full rate	rimgroup part rate	rimgroup total	admin total	diff	rimgroup total retired	% rim pens/ total retired
1992-93	1278535	583347	1861882	1877376	-0.8%	2344585	79.4%
1993-94	1202923	680380	1883303			2388833	78.8%
1994-95	1285635	672773	1958408			2431855	80.5%
1995-96	1314734	665521	1980255	1981200	0.0%	2474003	80.0%
1996-97	1489284	527172	2016456	2024400	-0.4%	2516933	80.1%
1997-98	1599931	452212	2052143	2051821	0.0%	2560161	80.2%
1998-99	1621585	466184	2087769	2080794	0.3%	2603103	80.2%
1999-00	1585413	499599	2085012			2647695	78.7%

Table 3 below compares the detailed distribution of pensioners by gender and payment rate for 1992-93.

Table 3: Pensioners by gender and payment rate,1992-93

	males actual	rimgroup	difference
full rate	442323	463857	4.9%
part rate	219717	206245	-6.1%
	662040	670102	1.2%
	females		
full rate	807490	814678	0.9%
part rate	407664	377102	-7.5%
	1215154	1191780	-1.9%
	total		
full rate	1249813	1278535	2.3%
part rate	627381	583347	-7.0%
	1877194	1861882	-0.8%

RIMGROUP has slightly too many males and slightly too few females and consistently too many full raters and too few part raters. Again the full /part rate difference may be attributed to sources of income not in the model as noted above.

Sensitivity Issues

While the above fit may appear quite satisfactory, it should be noted that the growth of pensioner numbers is *very sensitive* to the exact values allocated to initial asset values, the levels of non superannuation assets upon retirement and drawdown patterns by gender and decile. A considerable amount of adjustment was needed to achieve the degree of fit shown above. Similarly the relative number of full and part pensioners is very sensitive to the exact values allocated for these parameters. However the amount of pension paid is less sensitive, as much of the sensitivity arises from the numbers of marginal part pensioners (compared with no pension at all) or from persons on the margin of getting a full pension.

Another factor in the current benchmarking is the *substantial reduction* in the bond rate over the period with returns and deeming rates both *responding immediately* to the change in bond rate. This creates the situation where the number of pensioners tends to grow because of factors outside of the demographic and retirement decision processes and makes it harder to achieve very good alignment with the forward estimates which seem to be based on trend projections rather than specifically adjusted for changing rates of return.

Overall, the current fit with administrative data and forward estimates seems very adequate, with RIMGROUP very slightly overestimating pension costs by only an average 0.5% and underestimating numbers by an average of 0.2%. The model therefore seems to be at a suitable stage for analysing retirement policy differences. If it were to be used as a shorter term forecasting method, it would be important to make adjustments (probably in a spreadsheet) for the inability of RIMGROUP to reproduce the exact timing of the increases in age pension age for women, as in the current version of the model we can only change age pension eligibility in whole years.

ATTACHMENT C

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 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 SGC will retain these higher levels;
- the rate of closure of the more generous private sector funds;
- 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 and 1997) The RIM figure published in July 1996 was $373b, compared with the figure of $363b in July 1997, and our revised figure of about $397b in the Table below reflecting recent exceptional investment performance.

	Public DB funds	Private DB funds	Private DC funds	Total SGC funds	Personal rollover funds	Self employed	Grand Total al funds	Grand Total all funds
	$M - Curren prices	$M - Current prices	$M - Current prices	$M - Curre prices	$M - Curre prices	$M - Current prices	$M - Current prices	Percent of GDP
At JUNE								
2000	$82,992	$72,351	$46,359	$54,571	$58,582	$31,355	$396,807	65.8
2005	$112,752	$100,874	$72,261	$104,859	$81,076	$37,955	$594,425	78.3
2010	$150,336	$140,913	$109,061	$173,267	$103,608	$44,096	$860,136	91.3
2015	$192,837	$189,607	$155,581	$258,557	$129,414	$49,824	$1,184,453	102.6
2020	$241,030	$247,524	$212,665	$361,560	$158,592	$56,413	$1,581,065	112.3

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 are much lower than recent projections by Rice Kachor and the National Bank; the author does not know the reasons for the very substantial differences in the Rice Kachor projections.

The outstanding distributional pattern of the trends in the above table is the growth of SG accounts from their current level of about 12% of total superannuation assets to about 23% in 2020.