

RETIREMENT INCOME MODELLING TASK FORCE

AGGREGATE AND DISTRIBUTIONAL ANALYSIS OF AUSTRALIAN SUPERANNUATION USING THE RIMGROUP MODEL

**George P Rothman
Retirement Income Modelling Task Force**

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The Retirement Income Modelling Task Force
c/- The Treasury, Parkes Place, Parkes, Canberra 2600.

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Abstract

RIMGROUP is a comprehensive cohort based lifetime accumulation model which makes projections on both the amounts and distribution of superannuation, other savings, retirement incomes, social security payments and tax concessions. This paper uses the RIMGROUP model to provide projections of superannuation aggregates and flows over the period to 2020 together with some representative distributional data by account type, gender and income.

Superannuation asset levels are projected to reach \$370b in June 2000, \$930b in 2010 and \$1810b in 2020. Putting a reasonable bound of uncertainty around these figures suggests a range of \$350-390b for June 2000, with higher percentage error bars as we go further out. The principal distributional feature by account type is the dramatic rise of Superannuation Guarantee (SG) accounts which increase from 12% of total superannuation assets now to 32% in 2020.

Average superannuation assets rise rapidly for all gender age and income groups over the period with some significant levelling of relative assets by gender and income.

A shorter term analysis to June 2005 is also presented which examines the impacts of recently announced superannuation initiatives of the Coalition Government, namely, the facility for lower paid workers to opt out of compulsory superannuation, spouse contributions and the introduction of Retirement Savings Accounts (RSAs). The individual impacts of the policies are examined together with their overall impact. Overall, these initiatives are estimated to reduce superannuation assets by only about \$2.5b in 2004 (over a base of \$600b) and national savings by about 0.1% of GDP. These estimates are much lower than those provided in the recent AMP paper (Issue 2 of 'SuperTrends', May 1996) but necessarily rely on judgements, particularly on take up rates, as well as analysis of available data.

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The views expressed in this paper are those of the author and do not necessarily reflect the views of the Departments financing RIM or of their Ministers or advisers. The author would be pleased to discuss aspects of this paper and can be contacted at the above address or phone 06-2633947.

Aggregate and Distributional Analysis of Australian Superannuation using the RIMGROUP Model

Introduction

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, accumulates 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 60 plus years of the projection period *separately for each birthyear gender decile cohort*. The model projections begin in July 1992. The RIMGROUP model builds upon and extends the task force's aggregate modelling capability which until now 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) and Gallagher (1995).

More details of the RIMGROUP model are given in Gallagher and Preston (1993) and Gallagher (1995) and in Attachment A. Developing RIMGROUP has been a major project of the Retirement Income Modelling Task Force and contributed to by all members of the Task Force.

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 and at this conference (including Bacon, 1994, 1995, 1996a-b,; Brown 1994,1996; Rothman 1995,a-d). Research has been carried out on superannuation sectors not previously well researched, such as the public sector, self employed and rollover funds. A very 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 (see Attachment B).
- 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; to a limited extent it has been so used already (Treasury, 1996)
- 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 rich range of distributional results are available as well as key aggregates.
- The very extended time frame, to 2060 if required.

- The facility to make changes in all underlying parameters and assumptions including the facility 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 working¹. 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 remains unavailable in the detail needed. Even though extensive research and some commissioning of new data has been undertaken already, the extensive and demanding data base will require further development and fine tuning.

Data sources & Parameter Research

A broad specification of the special data sources of the Task Force and of the sub models of RIMGROUP (such as POPMOD) is given at Attachment B. Attachment B also lists other complementary models of the Task force such as RIMHYPO which models individuals and couples in a similar way to the way RIMGROUP models the whole Australian population but allows full specification of individual differences in income and labour force experience and avoids ‘pooling’.

Treatment of Superannuation

In RIMGROUP superannuation parameters are applied towards the end of the parameter integration chain. The POPMOD module of RIMGROUP (Bacon, 1994) produces a population specified by gender and age in each year of the model. A labour force module (LFSMOD-see Bacon, 1996b) allocates these persons to the workforce or otherwise with those working allocated to private, public or self employment by decile of lifetime income from work. For those working within the private or public sectors² a filter is first applied as to the proportion of that group which have superannuation cover. Finally, for the particular year of the modelling, a fuller version by age group of Table 1 below is applied to map these people onto given account types which have their own assets and superannuation contributions as estimated in Rothman, 1995a. Separate accounts are kept for established defined benefit (dbe) and defined contribution (dce) funds and Superannuation Guarantee (SG) funds by sector, for the self employed, together with a combined personal/rollover

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

² But not for the self employed where the ATO file based methodology provides a direct estimate of the proportion of those in the self employed workforce who are contributing to superannuation .

account and an eligible rollover account used specifically to keep preserved funds for those retiring early.

Table 1
Percentage Allocation of those with Superannuation
to particular private sector account types

	men	Percent			
	decile				
		1	4	7	10
DBE		6.8	20.3	30.4	35.0
DCE		30.8	33.1	38.9	52.1
SGC		62.4	46.6	30.8	12.9
		100	100	100	100
	women	Percent			
DBE		4.9	8.0	13.0	28.7
DCE		3.4	4.0	8.1	17.6
SGC		91.7	87.9	78.9	53.7
		100	100	100	100

This setting up process is primarily governed by a very large set of parameter file inputs but is also integrated with parameters which can be directly changed through the interface. The parameter integration program consolidates detailed parameter information into the approximately 113000 records it generates- one for each gender, age, decile group in each year of the modelling. This data set sorted into cohorts becomes the base for the accumulation and subsequent phases of RIMGROUP. A diagrammatic representation of this process is at Attachment C.

Benchmarking RIMGROUP

A considerable number of RIMGROUP runs have been carried out aimed at making appropriate adjustments to the RIMGROUP parameter set and structure so that the results align with known benchmarks including the numbers of people with superannuation, contribution rates, superannuation assets and so on. A particular aim has been to track history over the period 1992-1995 after updating to the new ABS/ISC survey results (ISC,1996).

After fine tuning adjustments the dynamics of the model track history very well over the period 1992-95, matching asset levels to better than half a percent. Longer term comparisons are discussed in a later section.

Besides superannuation levels there are several other key areas that recent history can be checked against. Firstly the numbers of people with superannuation should align with the numbers reported in the ABS Superannuation survey, both in aggregate and in distribution by gender and sector. This is broadly the case after some initial adjustments. The dynamics of coverage assumed in RIMGROUP is that spread of superannuation, particularly at the basic SGC level, continues up to June 1995. Thereafter coverage proportions, themselves functions of age, gender and sector, stay constant and the numbers with superannuation coverage change in line with demographic and labour force changes.

Another reasonable check is against the Tax Expenditures Statement's reported levels of ETP taxation. The levels currently calculated in RIMGROUP are broadly comparable with those in the Tax Expenditures Statement but somewhat too high: for example in 1992-93, the version of

RIMGROUP used in this paper calculates total ETP tax at \$409m while the Statement shows \$335m. This suggests that outflows in RIMGROUP may be somewhat too high³.

The current version of RIMGROUP has been updated in line with the recently published assets series produced by the ABS /ISC and importantly for the much higher annual rates of growth implied by the new series; for example asset growth in 1993-94 has been increased from about \$15b. in the previously published series to about \$20b. as used in this analysis. In fact RIMGROUP is easier to align with known historical data with the new growth series than the earlier one.

However, some uncertainty remains about the correct level of flows into and out of the superannuation system. Various official data sources, reasonably consistent with each other, indicate total contribution flows of about \$17 b per annum in 1993-94 (see Attachment D), whereas the revised view of the ISC contributions data put forward in July 1995 (Dunnin, 1995), estimated contribution flows at about \$26 b per annum for the same year- with correspondingly larger outward flows so that the overall build up of superannuation assets remains the same. For 1995-96 the current version of RIMGROUP has a total of pre tax contributions of \$18.8b, while the latest published ISC contributions flow data (ISC, 1996) shows total contributions at a little over \$6b per quarter which extrapolates to an aggregate of about \$25b for this financial year. The lower range of flow estimates - also used in RIP (Rothman & Bacon, 1994) and in Knox, 1995 - is more compatible with a range of data collections including the Labour Costs and Superannuation Surveys of the ABS and ATO tax statistics. Importantly, the lower range is much more consistent with making the dynamics work; even allowing for some further refinement of retirement rates, modelling based on the (agreed) level of assets and asset growth of the new ABS/ISC series produces outflows from superannuation significantly lower than the new ABS/ISC flow data. Further, the ETP tax comparison noted above suggests that, if anything, outflows in RIMGROUP, particularly in relation to losses on job change, may be on the high side.

Part of the explanation of the difference discussed above lies in the different treatment of the public sector in RIMGROUP and models of the same general type as compared with the survey. RIMGROUP seeks to model only actual assets in the superannuation system, including those held by retirees, but not unfunded liabilities of the public sector. Similarly the model counterbalances this with outflows from real assets, although it also estimates the extra 'pay as you go' payouts from State Governments and insurance payouts, so that total retirement incomes and taxes may be complete. The survey on the other hand counts as both contributions, and outflows, momentary inputs from State Governments into public funds which are then immediately used to pay pensions and cash payments to pensioners and retirees including those being retrenched. An estimate of this flow, including insurance payouts, is about \$3 to 3.5 b per annum. This brings the estimates of contributions somewhat closer together but leaves some remaining gap.

Looking at the longer term, our experience with RIP gives a good understanding of the factors which are of major significance in making long term projections; while population and labour force

³ This is currently under review and our preliminary view is that the fit to ETP taxation can be improved while retaining the good fit to other historical data.

dynamics are not unimportant, economic factors, principally the rate of return on invested funds, tend to dominate these in affecting levels of superannuation assets and national savings (Rothman and Bacon, 1994). Broad level 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;
- similarly, 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 dynamics of pension costs are of course much more impacted by population factors such as longevity, and the assets of the retired and retirement rates which are discussed extensively in other papers.

Projecting the levels of superannuation assets in 2000, 2005, 2010 and 2020.

The Table below shows RIMGROUP projections by type of fund for recent history and for selected financial years out to 2019-2020. The line for, say, 1999 means the financial year 1999-2000 and gives levels at June 2000, with assets in the prices of the year in question. 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.

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 projections. The projections are presented here in the light of the clear interest shown in such output when produced from the RIP model some two years ago (Rothman & Bacon, 1994), and to see how consistent these projections are with other published projections. The earlier projection of the Task Force for June 2000 was \$320-380b in prices of that year, with the figure given in the published table being \$366.5b, fortuitously close to the figure in Table 2 below of \$373b given the major revisions since then to the asset base series together with significant policy changes.

Table 2: Superannuation Assets by Type of Fund

	Public DB funds	Private DB funds	Private DC funds	Total SGC funds	Personal & rollover funds	Self employed	Grand Total all funds
	\$M - Current prices	\$M - Current prices	\$M - Current prices				
YEAR							
1992	\$47,598	\$42,043	\$22,593	\$18,570	\$25,066	\$20,592	\$182,818
1993	\$51,226	\$45,184	\$25,050	\$22,233	\$28,630	\$21,582	\$202,800
1994	\$54,521	\$48,076	\$27,528	\$26,208	\$32,452	\$22,377	\$222,608
1995	\$59,663	\$52,712	\$31,308	\$32,321	\$36,998	\$24,012	\$251,258
1999	\$79,162	\$71,487	\$48,734	\$65,530	\$53,246	\$29,203	\$372,987
2004	\$115,131	\$106,284	\$85,241	\$146,937	\$76,554	\$36,417	\$609,573
2009	\$160,272	\$152,333	\$134,741	\$258,784	\$104,716	\$43,806	\$930,092
2014	\$212,299	\$207,183	\$196,451	\$400,470	\$139,889	\$51,134	\$1,328,331
2019	\$269,930	\$269,817	\$270,159	\$572,454	\$185,847	\$59,855	\$1,811,998

Over the longer term these figures are much higher than the aggregates published in Knox in July 1995, principally because of the impact of the policy of expanded member contributions together with the proposed government co contribution. On the other hand, the results are initially somewhat lower than recently published by the AMP who suggest an aggregate figure of over \$400b by the turn of the century; however our figure for June 2005 is very compatible with the AMP's view that the aggregate will reach \$600b in 2005.

Neither the Knox nor AMP models have the account structure of RIMGROUP nor other distributional detail by age gender or income. The outstanding distributional pattern shown in the above table is the dramatic growth of SG accounts from their current level of 12% of total superannuation assets to about 32% in 2020.

Turning to flows into and out of the superannuation system, the following table shows the key flows for financial years in the dollars of the year in question. The data are fairly self explanatory; However it should be recalled, as explained above, that a lower contribution series than that collected by the ABS/ISC is used. These projections are underpinned by projections of the population, labour force, productivity, unemployment and GDP as well as superannuation distributions and detailed coding of current policies and must be viewed as indicative only.

Table 3**Key Superannuation Flows**

year	\$ m in current dollars of the year		total payouts	net flows as % of GDP
	Contributions After tax	Fund earnings After tax		
1994	14882	13556	10441	4.37
1995	16679	21216	11462	5.96
1999	27262	20933	14838	5.86
2004	40280	33969	23000	6.90
2009	51089	51587	36017	7.11
2014	63834	73334	54055	6.99
2019	79288	99305	78534	6.81

Further Distributional Analysis by gender and by decile

As indicated above and in Attachment A, there is a great richness of distributional data incorporated in RIMGROUP and the following should be seen as illustrative only of distributional data about the superannuation system. There are also other data about the social security system, taxation and so on which will not be covered here. In Table 4 below RIMGROUP output is presented which shows the build up of the **real** average superannuation assets for typical deciles by gender. As well as significant growth for all groups, there is some improvement shown over time in relative levels by gender and decile. For example in 1994-95 for men the average assets of the fourth decile are about 20 % of those of the 10th decile, while in 2019-20 the relativity is 32.5%. The average assets of women in 1994-95 are 41% of those of men, whereas in 2019-20 the ratio is projected to be 64%. Similarly RIMGROUP projects (details not shown) that the proportion of all superannuation assets held by women will rise from 22.5% in 1994-95 to 32.6% by 2019-20.

Table 4. Real Average Superannuation assets by Gender, Year and Decile

GENDER Female

	YEAR	DECILE				
		1	4	7	10	ALL
		Avg all funds				
	1994	\$4,453	\$10,518	\$16,647	\$46,430	\$17,396
	1999	\$11,034	\$17,901	\$26,051	\$62,116	\$27,434
	2004	\$18,462	\$28,002	\$39,106	\$83,716	\$40,180
	2009	\$25,809	\$38,560	\$52,620	\$106,916	\$53,456
	2014	\$32,549	\$48,579	\$65,577	\$129,086	\$66,127
	2019	\$38,460	\$57,507	\$77,163	\$148,850	\$77,405

Male

	YEAR	DECILE				
		1	4	7	10	ALL
		Avg all funds				
	1994	\$16,292	\$23,367	\$46,684	\$117,078	\$42,451
	1999	\$24,589	\$33,707	\$60,074	\$148,660	\$57,124
	2004	\$32,702	\$48,113	\$76,395	\$182,134	\$73,984
	2009	\$41,127	\$62,946	\$92,662	\$216,945	\$91,102
	2014	\$49,029	\$77,116	\$107,578	\$248,771	\$106,957
	2019	\$56,126	\$89,758	\$121,205	\$276,287	\$121,067

ALL

	YEAR	DECILE				
		1	4	7	10	ALL
		Avg all funds				
	1994	\$11,933	\$18,058	\$34,258	\$84,865	\$32,091
	1999	\$19,969	\$27,337	\$46,010	\$109,130	\$45,016
	2004	\$27,718	\$39,838	\$60,694	\$136,559	\$59,923
	2009	\$35,659	\$52,774	\$75,578	\$165,467	\$75,224
	2014	\$43,060	\$65,088	\$89,493	\$192,385	\$89,569
	2019	\$49,687	\$76,096	\$102,154	\$216,056	\$102,380

Impact of Coalition policy initiatives

The above aggregates and distributional information are derived from a version of RIMGROUP which has included all aspects of the Coalition Government's announced policies, including the continuation of the Superannuation Guarantee, extension of member contributions and matching government co-contributions. The analysis presented below considers only those recent policy initiatives of the government which may impact on superannuation assets and national savings. The policy initiatives are analysed individually as variations from the base run, and then their aggregate impact assessed. The analysis covers only the period to 2004-5, partly to enable simple comparison with the recently published AMP analysis of some of these initiatives (AMP, 1996) and partly because the wide range of assumptions needed and possible consequential behavioural effects may make analysis over longer periods unreliable.

Opting out for Low Income Earners

One of the announced superannuation initiatives of the government is to allow persons earning less than \$900 per month to choose whether to continue to receive employer SG support or to receive an equivalent amount in additional wages. The rationale of this proposal is to recognise the individual needs of the lower paid and their low levels of accumulated financial reserves and also to reduce the problem of small amounts in the superannuation system.

The modelling of this policy in RIMGROUP starts with an examination of ABS data on the income distribution of workers. There are two principal data sources, one based on employer records and the other based on surveys of employees. The employee based data (ABS, 1995) is considered more comprehensive and in June 1995 shows 171,000 men and 353,000 women eligible to participate in this policy.

To incorporate this into the RIMGROUP model these aggregates need to be further allocated by account type, age and career earnings decile. This has been done using the Task Force's Income Distribution Survey (IDS) based file developed for the Career Earnings Project (CEPROC - see Attachment B); this file has a decile marker attached to the extensive income, employment and other data on the IDS file. The resulting distribution is shown in the Table in Attachment E where an 80% takeup of the policy has been assumed. The changes were then incorporated in RIMGROUP noting that most of those in this income range have only minimum SGC support and using an average income for those opting out of \$8,000 (indexed) so as to minimise pooling effects particularly for those in higher deciles (of lifetime earnings).

The result is an estimated decrease of superannuation assets in the year 2004-2005 of about \$1.9b and a reduced annual national savings flow of \$200m in that year; this is equivalent to 0.026 % of GDP. These are much lower figures than the estimates in the AMP paper of a reduction in assets of \$3.4b and a national saving flow reported as 0.1% of GDP in that year. The distributional impact is to reduce the coverage of superannuation particularly in the lower income deciles with the impact being greater for women than for men.

Spouse Contributions

Another policy proposal of the Coalition Government is to allow persons to make contributions of up to \$3,000 pa on behalf of their spouses who have annual incomes of less than \$10,800, with the incentive being the receipt of an 18% tax rebate for contributions up to the \$3000 limit. The

rationale for this policy is to encourage continuing superannuation savings for those with (perhaps temporary) lower incomes and to bring about improved gender equity in the superannuation system by building up the superannuation holdings of women.

The starting point for this analysis was a different version of the IDS file incorporating matched couples so the patterns of incomes of the partners could be analysed. This gives information by age and income (but not decile) which has been adjusted to benchmark against published ATO tax statistics on individual and matched couple incomes (ATO, various years). A working assumption was made that effectively no contribution would be made where the person contributing on behalf of their spouse earned less than \$50,000 pa and that the level of contribution would rise as income rose above the \$50,000 threshold. This results in an estimate an eligible population of 194,000 in 1996-97 with essentially all of those who would receive the benefit of the contributions being female and with the most common age group being 35-39 years. The assumption of contribution level rising with income also gives a pattern of contribution rising with age from about \$500 for the lowest age range to about \$2,200 for the older age ranges.

Two further assumptions need to be added in to complete the analysis. Firstly the distribution by decile needs to be allocated and I have assumed that the contributions would apply only for spouses in the higher deciles of career earnings, ie deciles 6-10. I have also assumed that takeup would be moderate at 50% of those eligible.

Even with these conservative assumptions the effect of the proposed policy is to increase superannuation assets in the year 2004-2005 by about \$2.3b above the level which they would otherwise have been and the annual flow of superannuation saving by \$300m. The cost of the rebate is estimated at \$35m in 1997-98 and \$53m in 2004-2005. It is worth noting that the impact on the superannuation system of the spouse contribution is greater than the (negative) impact of the opting out policy and the AMP analysis (AMP, 1996) did not consider the spouse contributions policy. In distributional terms, spouse contributions raise the relative share of superannuation assets owned by women and may partly offset the reduction in coverage associated with opting out.

Estimating the national saving effects is more problematic as much of the additional flow into superannuation will come from a reduction of other saving, rather than a reduction of consumption. For the purposes of this analysis an offset of 70% is assumed, ie only 30% of the spouse contribution flow is assumed to be additional saving. In this case, the estimated increase in national saving from this policy in the year 2004-5 reduces to about \$120m.

Retirement Savings Accounts

The Coalition Government also intends to widen the choices available to persons with superannuation by ensuring that substantial choice is available as to where such funds are invested; specifically, this choice to include the option of using Retirement Savings Accounts (RSAs) to be offered by banks. Besides offering increased choice, the advantages of RSAs are simplicity, capital stability and possibly lower administrative fees. They are likely to be attractive to persons with relatively low balances, those who change jobs frequently, and perhaps some persons close to retirement.

Once the likely proportion of funds that would move to RSAs and the likely difference in investment return have been estimated, an analysis of the impact in RIMGROUP is a relatively easy task which involves a simple modification of the rate of return for specified funds in the RIMGROUP interface.

The AMP analysis (AMP, 1996) assumes that RSAs would return, on average, 4% lower than superannuation funds and also assumes that, almost immediately, some 25% of fund assets would shift to RSAs, thus implying that the total return over all superannuation assets would fall by a full percentage point.

Analysis by the Retirement Income Modelling Task Force suggests that the difference in return between superannuation funds and RSAs may be around 2 to 3 percentage points rather than 4 percentage points. This is based on Table 5 below (prepared by Phil Gallagher, Director of the Task Force) taken together with associated analysis which suggests that industry funds earn about one percentage point less than funds overall.

Table 5. Returns by Year from Rainmaker - Norwich Survey (1996) and DX data

	1992/93	1993/94	1994/95	3 Years
All funds	10.0	7.7	7.2	8.3
Ten Year Bond	8.35	7.39	9.85	8.53
Crude 6 month Term Deposit	5.35	4.60	6.64	5.53
RSA estimate ⁴	4.82	4.14	5.98	5.0
CPI Growth	1.77	1.28	3.84	2.73

Members of funds will have a choice as to where to keep their superannuation assets and can be expected to make that choice wisely. If the return from RSAs were to be much lower than that of traditional superannuation funds, then very much less than 25% less of all superannuation assets are likely to be invested in RSAs. For the purposes of this analysis we have assumed 10% of industry funds and defined contribution funds are moved into RSAs and have chosen the difference in annual returns as 3%, the higher end of the range. Defined benefit funds are unlikely to change and rollover fund returns are already aligned with the returns expected for RSA's.

Based on these assumptions the result is an estimated decrease of superannuation assets in the year 2004-2005 of about \$3.0b, reduced private savings flow of \$660m and an estimated reduction in national saving in that year of 0.085% of GDP. This may be compared with a much larger reduction of \$25b in assets calculated by the AMP but interestingly a reduced national saving flow only slightly larger at 0.1% of GDP.

The Aggregate Impact of these Government Initiatives

Taken together the above analyses project that the aggregate impact of these Government superannuation initiatives is to reduce superannuation assets by only about \$2.5b in 2004-5 (on a base of over \$600b) and national savings by about 0.1% of GDP. These figures are much lower than the estimates of the AMP. The results should also be viewed in the context of the Government's stated aim of reducing the Commonwealth Budget deficit by \$8b annually, which is about 1.7% of GDP; similarly the impact of changing overall returns of all superannuation funds consistently by (only) half a percent changes the projected aggregate level of superannuation assets in 2004-5 by about \$17 b.

The distributional impact of the initiatives is to slightly increase the share of assets held by women but to reduce the superannuation coverage of women more than the coverage of men.

⁴ Based on 6 month term rate after tax

Conclusions

RIMGROUP is being developed as a comprehensive cohort based lifetime accumulation model which generates projections on both the amounts and distribution of superannuation, other savings, retirement incomes, social security payments and tax concessions. RIMGROUP is distinguished from other models of this general type by the extensive parameter research that underlies it, the richness of its distributional data and its very long term time dimension. The working life phases of RIMGROUP benchmark well and the retirement phase has been greatly improved recently; some aspects continue to be developed further.

The main uses of RIMGROUP are to distinguish between the implications of various policies including the distributional consequences and assessing the robustness of the differences between policies to reasonable differences in key parameter settings. Nonetheless, reflecting broad interest in such matters, this paper uses the RIMGROUP model to provide a set of projections of superannuation aggregates and flows over the period to 2020, together with some representative distributional data by account type, gender and income.

Superannuation asset levels are projected to reach \$370b in June 2000, \$930b in 2010 and \$1810b in 2020. Putting a reasonable bound of uncertainty around these figures suggests a range of \$350-390b for June 2000, with higher percentage error bars as we go further out. The principal distributional feature by account type is the dramatic rise of Superannuation Guarantee (SG) accounts (which in RIMGROUP includes most Retirement Savings Accounts); this account type is projected to increase sharply from 12% of total superannuation assets now to 32% in 2020.

Average superannuation assets rise rapidly for all groups over the period with some significant levelling of relative assets by gender and income.

A shorter term analysis to June 2005 has examined the likely impact of some recently announced superannuation initiatives of the Coalition Government, namely, the facility for lower paid workers to opt out of compulsory superannuation, the introduction of spouse contributions and of Retirement Savings Accounts. The individual impacts of these policies have been examined together with their overall impact. The overall impact of these initiatives is estimated to reduce superannuation assets by about \$2.5b in 2004-5 (over a base of \$600b) and national savings by about 0.1% of GDP. These estimates are much lower than those provided in the recent AMP paper (AMP, 1996). It should be noted that, notwithstanding extensive analysis of relevant data having been undertaken, such estimates rely on judgements made, particularly on aspects such as takeup of the policy and other behavioural effects, as well as on the appropriateness and comprehensiveness of the models used.

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THE RIMGROUP MODEL

INTRODUCTION

RIMGROUP is a comprehensive cohort projection model of the Australian Population which starts with population and labour force models, tracks the accumulation of superannuation in a specified set of account types, accumulates 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 60 plus years of the projection period *separately for each birthyear gender decile cohort*. The model projections begin in July 1992 and can run out to June 2060. There are over 4300 cohorts in the model covering the Australian population from their beginning work to death.

The model covers single years of age from 18 to 100 plus (83 age groupings) for each gender(2), for 10 lifetime income groupings (termed deciles) and for the 68 financial years mentioned above. The detailed information about each cohort in each year of the model is held in an individual record termed the record of the **group**; in this terminology there are 112880 group records (2 x 83 x 10 x 68). Additionally, as explained below, some information is generated at the sub group level, distinguishing within a group by, for example, the main type of superannuation coverage or the age range during which retirement takes place. Obviously keeping the model to a manageable size has required us to restrict the extent of subdivision below the group level.

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 to make specific projections of the future.

RIMGROUP is written in SAS. It is run on a Unix platform but is transportable to other platforms, though its size and complexity make it unsuitable for a PC. The 'strengths and limitations' of RIMGROUP have been discussed in a section in the Paper with this heading.

PRINCIPAL MODULES of RIMGROUP

Demography, Labour Force and Incomes

The model firstly generates basic demographic and labour force information about the cohorts. This process uses the component models POPMOD and LFSMOD described in more detail at Attachment B and in Bacon, 1994,1995,1996b. POPMOD provides annual projections of Australia's population by year for males and females by single year of age. It is driven by parameter matrices for fertility, mortality and overseas migration. LFSMOD produces projections by labour force status, age, gender and income decile. Labour force status is split by employed/unemployed, full-time/part-time, public/private, wage and salary earners/employers/self employed. Persons not in the labour force are split by retired/never in labour force/permanently disabled/temporarily not in the labour force.

This module of RIMGROUP also uses data from CEPROC (see also Attachment B) which is a set of complex procedures used to estimate career earning profiles by labour force status, age, gender and income decile. Persons working full or part time in each group are allocated earnings specified as a proportion of average weekly earnings.

Superannuation

Each Group subdivided by labour force status is then allocated to a principal superannuation account which has a great deal of detail supplied about it. For those working within the private or public sectors⁵ a filter is first applied as to the proportion of that group which have superannuation cover. These persons are then mapped onto given account types. Separate accounts are kept for established defined benefit and defined contribution funds and Superannuation Guarantee funds by sector, an account for the self employed, together with a combined personal/rollover account and an eligible rollover account used specifically to keep preserved fund for those retiring early. This mapping uses techniques developed in Rothman 1995.

For each account type for each group the following information is provided:

- proportion in account type
- initial superannuation balance
- employer contributions
- member contributions
- initial level of preservation
- initial undeducted contributions
- dissipation on job change
- flow to rollovers (separately for preserved and not preserved)
- hardship losses (separately for preserved and not preserved)

For some funds a few of the data items will clearly not be required, eg. there are no employer contributions for the self-employed. On the other hand, for the public sector defined benefit fund it is necessary to add information on the percentage of employer contributions which are funded and information on payouts. Rothman 1995a describes the data base used.

Accumulation of and Decrements to Superannuation

The above detail together with other information not needed to be supplied at group level (such as earning rates of funds and taxation rules) allows calculation of the accumulation of superannuation for each group together with appropriate decrements. Taxation and other arrangements such as preservation rules are modelled in considerable detail. There is also a very extensive decrement structure whereby monies can leave, (or transfer within), the superannuation system because of job change, hardship, permanent disability and death, as well as retirement and of course taxation.

⁵But not for the self employed where the ATO file based methodology provides a direct estimate of the proportion of those in the self employed workforce who are contributing to superannuation .

Retirement has been researched in detail, principally through construction of RETMOD (see Attachment B) which provides annual projections of partial and full retirement by gender, age and income decile.

Accumulation of Other Savings

Similar processes are also modelled for the accumulation of other financial savings and housing. At this time the modelling of such processes is not as advanced as the modelling of processes relating to the accumulation of superannuation. See also the description of ASSMOD in Attachment B.

Retirement Incomes

RIMGROUP calculates the number of people retiring from each account type and the aggregate value and components of their retirement benefits categorised by the type of retirement (disability or age). The retirement code categorises retirees in the following manner:

- 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 retired. There are 4 subgroups of retirees:
 - those retired before 55;
 - those retired from age 55 to age 59;
 - those who retired from age 60 to age 64; and
 - those who retired at 65 or later

In other words subgroups are created for the above categories as there are 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 or use historical allocations. Considerable study of current allocations has been undertaken by Brown, 1996 as part of the determining the initial distribution of assets and income of the retired for the start of the model.

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. To estimate these quantities in respect of beneficiaries more accurately, sub groups are formed by marital status and whether full or partial benefit is received; the projection of

beneficiaries and payments to them is linked principally to projections of unemployment but also in part to the projected dynamics of part time workers and those not in the labour force.

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 base levels of payment.

Taxation and Taxation Expenditures

Taxation projected to be due through any taxes on superannuation is modelled with user specification of tax rates and indexation readily available. A model of tax expenditures can also readily be incorporated given the distributional detail of the modelling.

PARAMETER STRUCTURE

A graphical representation of the complex parameter structure of RIMGROUP as broadly indicated above is set out at Appendix 1 of this Attachment. 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:

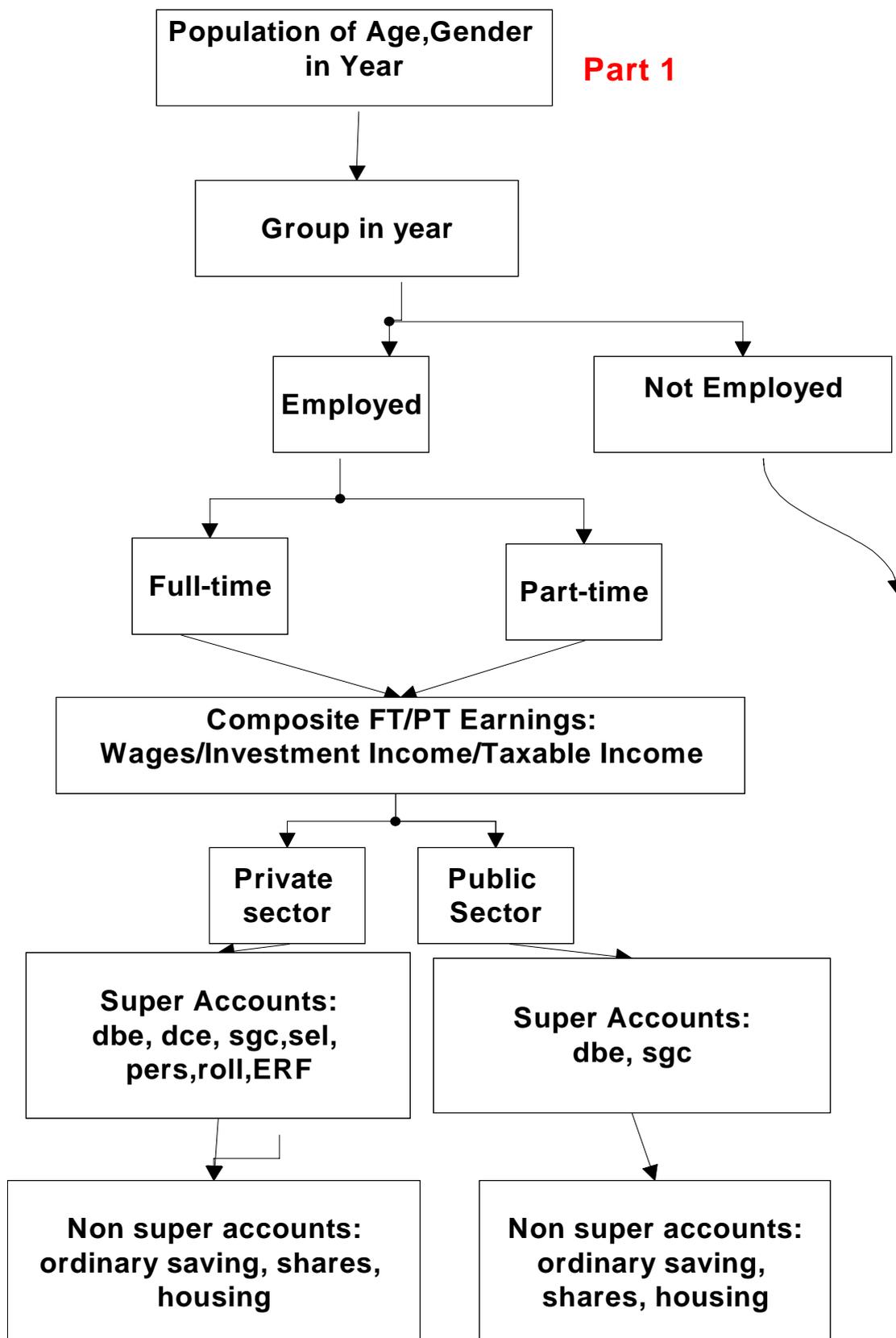
- 3% per annum for inflation
- 4% pa for growth of average wages for a person of given age and gender ⁶
- 6% pa for the long term bond rate;
- 7% pa for the average pre-tax return of superannuation funds (after expenses of managing funds but before tax- administrative expenses are deducted separately 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.

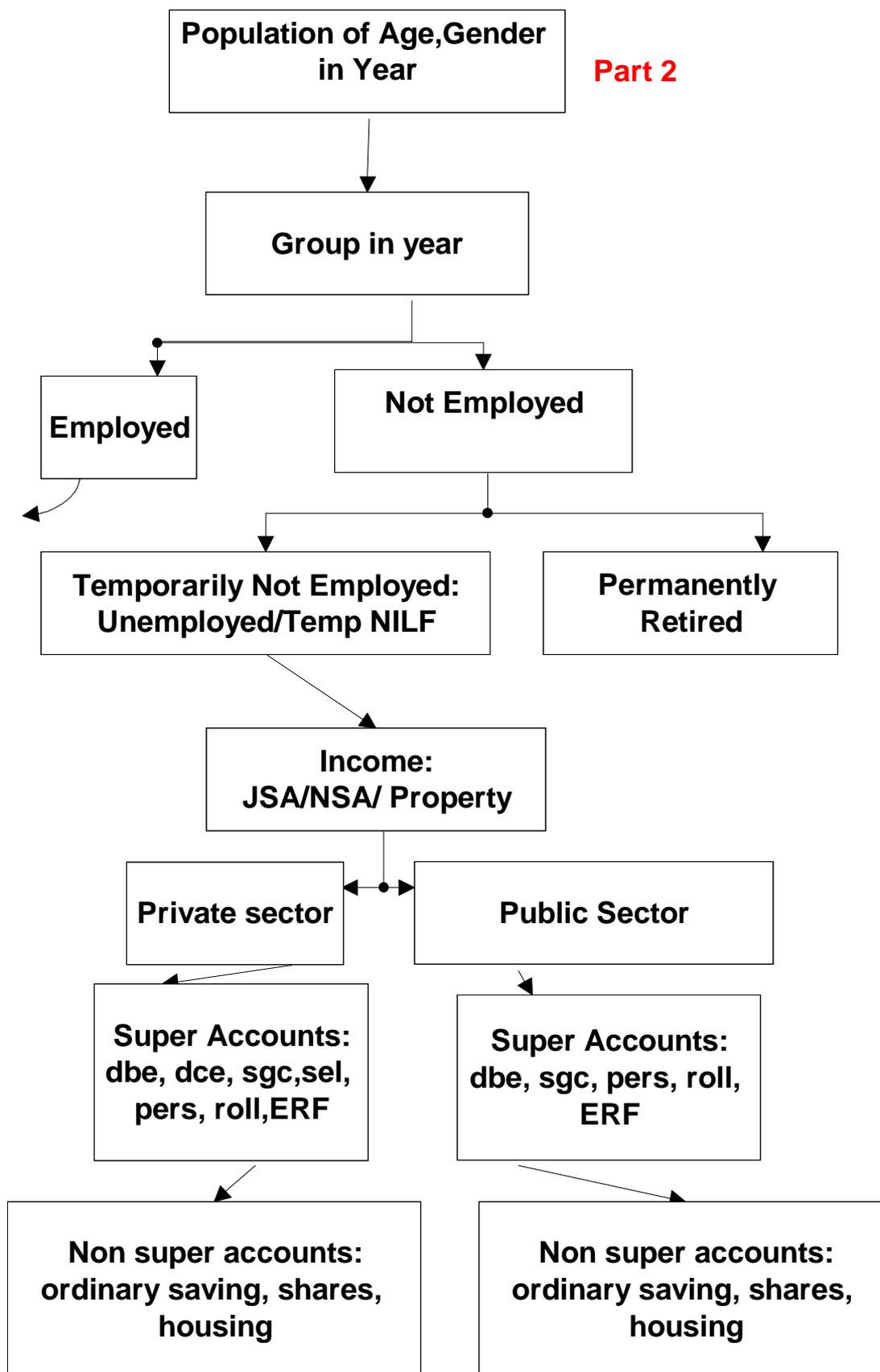
⁶ The actual wage outcome is impacted by demographic and structural change such as the increasing proportion of work which is part time.

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).

Appendix A to Attachment A

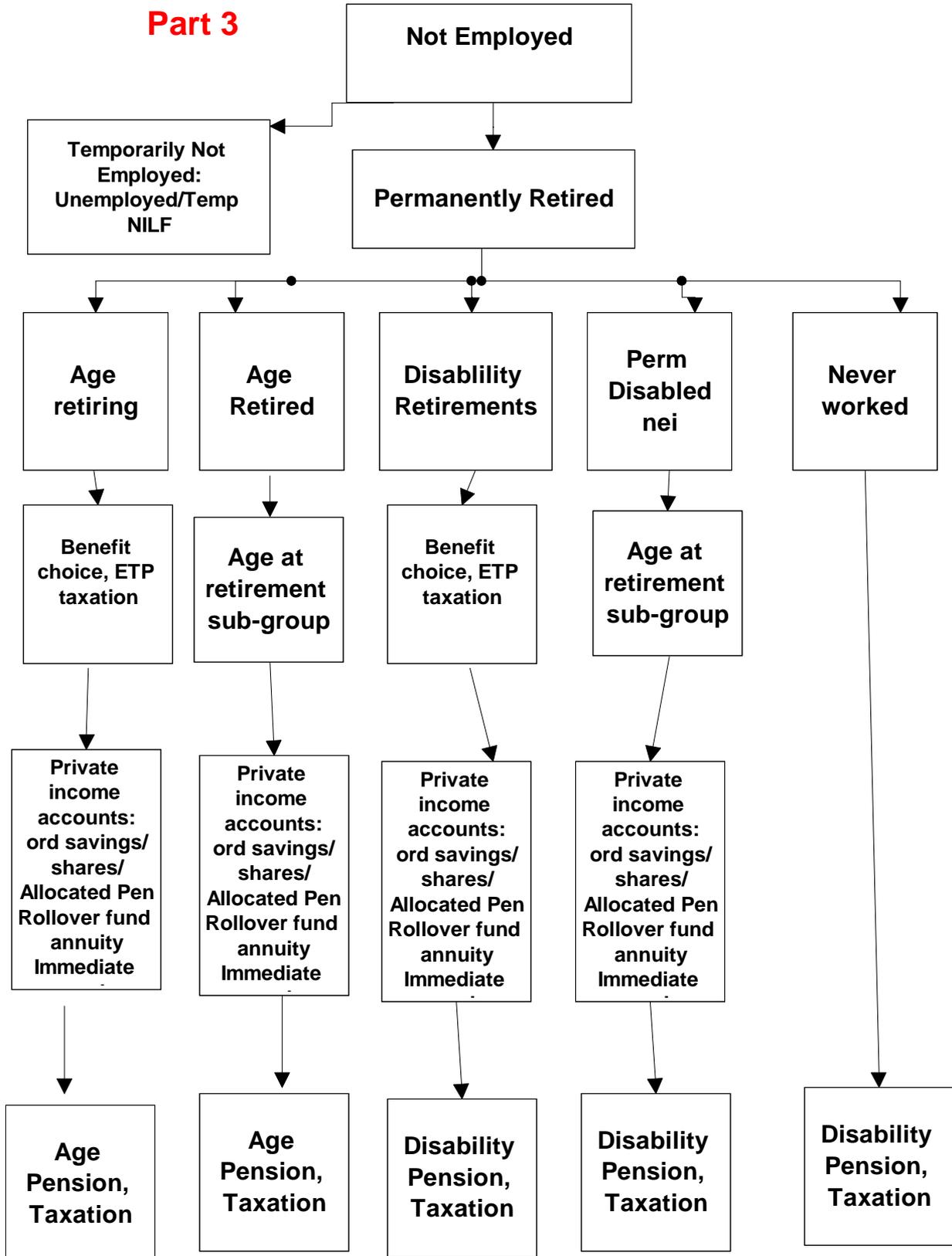
RIMGROUP PARAMETER HIERARCHY

RINGROUP PARAMETER HIERARCHY



RINGROUP PARAMETER HIERARCHY

Part 3



RIM TASK FORCE MODELS AND SPECIAL DATA HOLDINGS

MODELS USED AS COMPONENTS OF RIMGROUP

These models include a population model (POPMOD), a life expectancy model (LIFE), a labour force status model (LFSMOD), a financial assets model (ASSMOD), a retirement model (RETMOD) and a set of career earning procedures (CEPROC).

POPMOD - Population Model

POPMOD provides annual projections of Australia's population by year for males and females by single year of age up to 100 plus years. The model is driven by parameter matrices for fertility, mortality and overseas migration. The overseas migration sub-model accepts projection of permanent and long-term arrivals and departures and measures of category jumping. POPMOD is based on ABS population projection methodology (Bacon 1994)

LIFE - Life expectancy Model

The life expectancy model calculates survival rates, survivors to age x , deaths at age x to $x+n$, life table populations and life expectancy for males and females by single year of age up to 100 plus years. The estimates are constructed from the mortality parameters used in POPMOD.

LFSMOD - Labour Force Status Model

This is long-run annual model of the Australian labour force to capture structural (trend) behaviour in fine detail. The model projects persons by labour force status, age, gender and income decile. (Marital status of females is possible but not currently in use.) Labour force status is split by employed/unemployed, full-time/part-time, public/private, wage and salary earners/employers/self employed. Persons not in the labour force are split by retired/never in labour force/permanently disabled/temporarily not in the labour force. There is no short-run behavioural response in LFSMOD, the model simply runs off the observed underlying long-run movements of key, and hopefully stable, parameters, which are estimated as non-linear trends with consistent asymptotic values. Apart from these time-varying parameter matrices, the model's only exogenous inputs are population projections from a population model, such as POPMOD, and aggregate unemployment rates for males and females.

ASSMOD - Financial Assets Model

This model will provide annual projections of non-superannuation financial assets (ordinary savings and equities) and housing assets for males and females by age group. Because of asset switching between married couples, the model redistributes family assets between husband and wife to estimate assets held by individuals. Asset distributions by gender, age and income will be projected.

RETMOD - Retirement Model

This model will provide annual projections of partial and full retirement by gender, age and income decile. Because of the limited data available to model the underlying trends, this model will be provide with an easy user interface to permit user defined assumptions to be applied.

Although these models are provide inputs to the RIM microsimulation models, they all operate as stand-alone EXCEL systems and can be used as is, or modified to meet other policy analysis needs.

CEPROC - Career Earning Procedures

This is a set of complex procedures used to estimate career earning profiles by labour force status, age, gender and income decile. The procedures allocate the population by labour force status to each career earning decile. These allocations are used to construct the Income Decile Proportion parameters used in LFSMOD. Because of the complexity of these procedures, and the fact that they are a mixture of SAS and EXCEL, they have not been packaged as a stand alone.

SUPERANNUATION MODELS OTHER THAN RIMGROUP***INDMOD - Individual Model***

INMOD is a lifecycle projection model of superannuation and retirement incomes for hypothetical individuals and couples written in EXCEL.

RIMHYPO - Retirement Income Modelling Hypothetical Model

RIMHYPO - is a very detailed lifecycle projection model of working life incomes, superannuation, other savings and retirement incomes for hypothetical individuals and couples written in SAS.

RIP - Retirement Income Policy Model

RIP is the Task Force's enhanced version of the National Mutual Retirement Income Policy Model which tracks the aggregate superannuation accumulations and retirement incomes of age gender cohorts and which gives estimates of the national saving and fiscal impact of superannuation policies.

MEMSUPER - Member Superannuation Model

MEMSUPER is a static microsimulation model of employee personal superannuation based on a highly disaggregated summary file from the ABS Superannuation survey 1993.

SEMSUPER - Self Employed Member Superannuation Model

SEMSUPER is a static microsimulation model of self employed personal superannuation based on a highly disaggregated summary file from the 1992/93 individual taxation returns (see data sources below).

SPECIAL DATA SOURCES

ISC Extract Files

Two files have been made available by the Insurance and Superannuation Commission (ISC) as SAS data bases which provide key data items from their 1992/93 returns for both superannuation funds and ADF's aggregated by size of fund to preserve confidentiality.⁷ Both files have both stock and flow information and importantly the superannuation file includes some differentiation by type of fund and public and private sector (as assessed by the ISC staff). There is some information on gender of the members but not on assets or contributions by gender, and no information on age or salary of members nor of the number of members who receive payouts. The data is known to exclude flow information from funds which have all their investments in insurance policies and this appears to exclude up to 50% of rollover funds..

Private Sector Superannuation Sample File

A unique data holding of the Task Force is a collection of files on individual private sector superannuation accounts and contributions. This was prepared by Colin Brown (Brown, 1994) from data kindly made available by large private sector organisations. The files are unique in Australia in the detail of the information they hold being categorised by gender, age group and salary. Individual privacy has of course been preserved. There are some limitations of the data in relation to comprehensiveness and accuracy of the salary information and the representativeness of the sample.

Extract File from ABS Superannuation Survey

A file has been prepared for the Task Force from the ABS Superannuation Survey. This provides grouped data including most of the data items used to produce the ABS publication summarising the November 1993 Survey (ABS, 1994). This allows detailed computer analysis of aspects such as personal and member contributions to superannuation and lump sum payments received, allowing analysis by sector, sex, age and income and cross tabulations and detail not covered in the publication.

Australian Taxation Office Grouped Data File

Another valuable file used by the Task force is an extract of the data base of the Australian Taxation Office (ATO) providing grouped data detailed information on tax payments related to superannuation, ETPs, pensions and annuities together with a very rich set of classifying data by gender, age, income, occupation and whether or not the person is self employed. The data set is a powerful one for the areas covered as it is based on census data rather than survey samples. The extraction of a self employment indicator is unique as it was coded specially for the Task Force.

⁷ The provision of these files by the ISC's Statistics Unit is greatly appreciated.

Public Sector Superannuation

Additionally a paper collection of information on Australian public sector superannuation has been assembled which, despite its limitations, is likely to be broader in scope than any other collection in Australia. All major States have kindly responded to initial telephone inquiries and provided useful published material mainly at the aggregate level; South Australia has also provided more detailed material on an age/sex/income basis. Limited information on Public Trading Enterprises (such as Australia Post and Telstra) has been obtained while literature searches and searches for experts in this field have had extremely limited success.

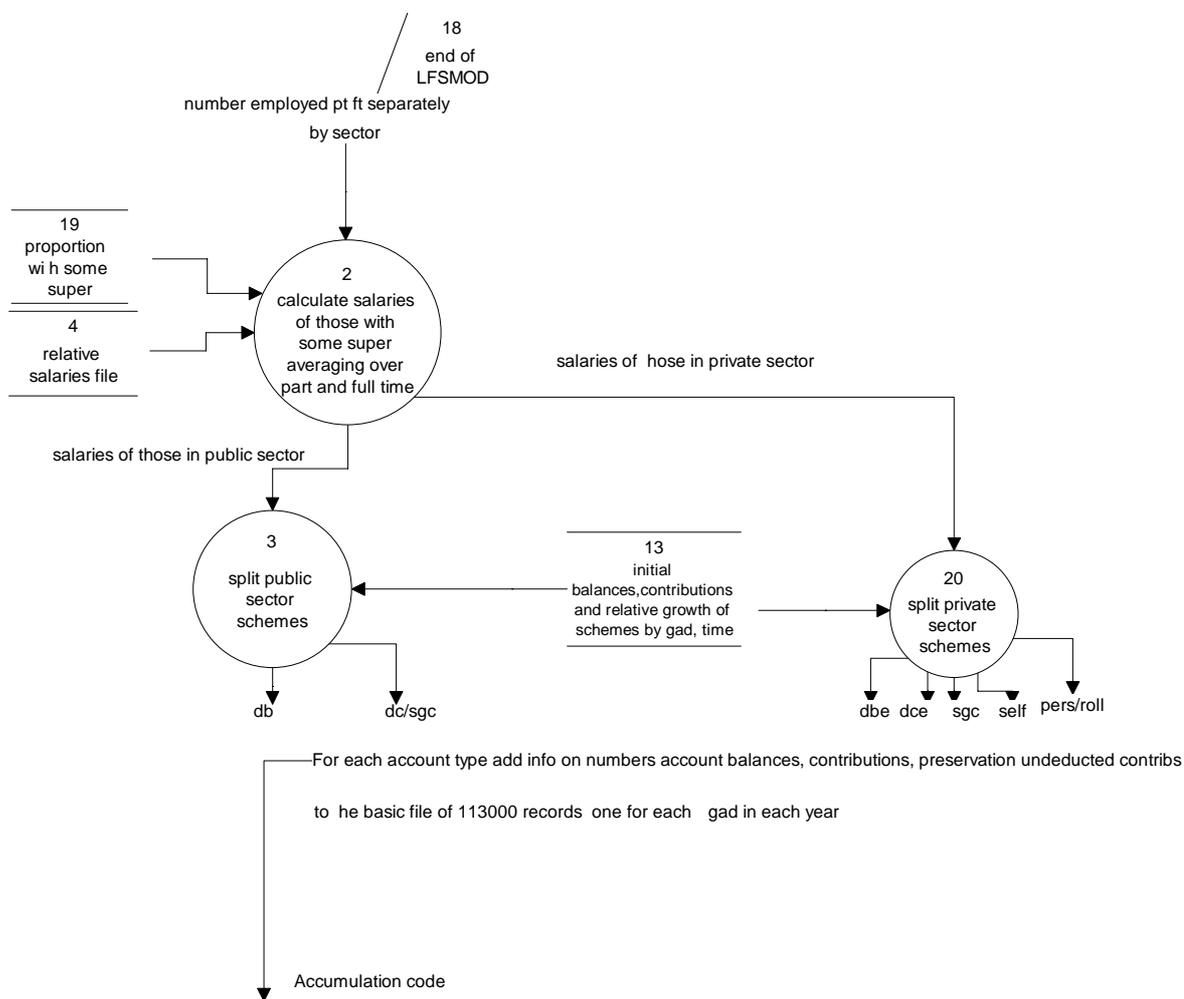
DSS Unit Record Sample Files

There are two such files. The first contains a 10% random sample of all Department of Social Security (DSS) pensioners as at December 1994. The file covers age pensioners, mature age allowees, invalid pensioners, rehabilitation pensioners, wife and carer pensioners. It lists details of the type and amount of pension paid, income items counted for the income test and asset items counted for the assets test. The file is an anonymous unit record file containing records for some 58,000 couples and 148,000 single persons.

The second is a similar file comprising a 9% random sample of DSS pensioners as at February 1995. The file covers unemployment and sickness beneficiaries and of their partners if they also receive benefits. It lists details of the type and amount of benefit paid, marital status, and income of the person and their spouse counted for the income test together with basic demographic information of gender and age. This file is also an anonymous unit record file containing records for some 23,000 couples and 58,000 single persons.

Attachment C

Parameter Integration with emphasis on Superannuation



Attachment D**REVIEW AND COMPARISON OF DATA SOURCES FOR ESTIMATING SUPERANNUATION CONTRIBUTIONS**

One major data source in this area is the ISC file used in the preparation of their now superseded Superannuation Bulletin; while this survey attempted to be comprehensive in relation to coverage of superannuation funds it was pointed out that there was no requirement for funds which had all their assets invested in the statutory funds of life insurance companies to report flow information. This was given as one of the principal reasons why the revised data reported in the July 1995 Dunnin paper was prepared.

Another important source of information is the ATO publication “Australian Taxation Statistics” which has a substantial section on superannuation which gives information on taxable employer contributions in some detail together with some limited information on contributions made to life insurance companies.

Another source of information on employer contributions is the “ABS Labour Costs” survey, the results of which is published in ABS 6348.0.

Information on the contributions of the self-employed has been analysed by myself using a special ATO file and reported in detail in Rothman 1995d, with summary results contained Rothman 1995a.

Information on personal and member contributions is contained in the ABS publication 6319.0 which is based on the ABS Superannuation Survey (ABS, 1994)

The estimates contained in the Knox model (Knox, 1995) referred to above essentially use the ABS sources referred to rather than the ATO and ISC data.

A summary of aggregate information based on these sources is set out in Table 1 below.

Table 1. Summary of Key Superannuation Flow Aggregates from various sources.

	Year		
	91-92 \$ billion	92-93 \$ billion	93-94 \$ billion
Employer contributions - ATO ⁸	8	9	11.5
Employer contributions - Labour Cost Survey	8.8		11
Member contributions incl. self-employed ⁹	6	6-7	5-6.5
Total contributions - before tax	14-15	15-16	16.5-18
Knox paper (RIMGROUP similar)	14.5-15	15-15.5	16-17
Dunnin paper	22.0	24.1	26.2

⁸ includes contributions to life companies and adjustments for transfers

⁹ based on ABS superannuation survey and ATO based analysis for self employed

Attachment E**Distribution of those Opting Out**

Adjusted to ABS wage data and 80% takeup

men

	DEC										ALL
	Decile 1	Decile 2	Decile 3	Decile 4	Decile 5	Decile 6	Decile 7	Decile 8	Decile 9	Decile 10	
Age											
18-20 years	12090	15634	9845	3410	2074	3873	2496	2586	1074	1080	54162
21-24 years	5204	1424	962	1346	716	604	646	1615	343	799	13661
25-29 years	5750	1370	537	869	267	244	846	179	162	151	10376
30-34 years	4327	270	848	862	891	816	159	435	281	93	8982
35-39 years	3950	218	332	563	696	1782	125	96	78	442	8283
40-44 years	6558	1093	457	1562	347	303	276	505	858	205	12166
45-49 years	5343	724	701	663	1259	882	433	369	673	295	11343
50-54 years	3619	567	221	467	173	154	1497	128	117	109	7052
55-59 years	4013	174	133	107	91	79	69	62	57	55	4839
60-64 years	2080	1447	301	372	361	315	261	209	176	703	6226
ALL	52937	22923	14337	10222	6875	9050	6810	6186	3822	3931	137090

Women

	DEC										ALL
	Decile 1	Decile 2	Decile 3	Decile 4	Decile 5	Decile 6	Decile 7	Decile 8	Decile 9	Decile 10	
Age											
18-20 years	4718	6438	7537	4694	4255	2837	2116	2680	1619	2176	39069
21-24 years	3166	1978	1702	1715	1943	1586	1024	1017	878	943	15951
25-29 years	5953	4300	4369	3414	2528	2863	1626	1360	1148	973	28533
30-34 years	7873	6868	4861	4631	3903	3268	3038	2513	2539	1992	41485
35-39 years	8148	7375	5612	5129	4374	3493	2920	2824	2243	1849	43967
40-44 years	7239	6653	5587	5568	5091	3658	3630	2572	2626	1932	44557
45-49 years	7602	4484	4154	4124	2966	2501	2110	1815	1679	1792	33229
50-54 years	4026	2546	2787	2209	1797	1475	1217	1012	860	736	18665
55-59 years	1484	1367	1342	1815	1254	1027	843	705	617	500	10952
60-64 years	526	757	787	779	715	584	480	393	328	278	5628
ALL	50734	42767	38736	34078	28827	23292	19004	16892	14536	13171	282037