

**Review of Northern Territory
Workers Compensation Scheme
as at 30 June 2003
Report to Scheme Monitoring Committee**

January 2004

Trowbridge Deloitte Limited
A.B.N. 56 092 651 057
505 Bourke Street
Melbourne VIC 3000

Tel: +61 3 9208 6555
Fax: +61 3 9208 6599
www.trowbridge.com
Consultants & Actuaries

Trowbridge Deloitte

21 January 2004

Mr Mark Crossin
Chairman
Scheme Monitoring Committee
NT WorkSafe
GPO Box 4160
DARWIN NT 8001

Dear Mark

**Review of Northern Territory Workers' Compensation Scheme
as at 30 June 2003**

We are pleased to enclose our report outlining the findings of our sixth annual review of the Northern Territory Workers' Compensation Scheme (the Scheme). The report has been prepared for the Scheme Monitoring Committee to assist with the fulfilment of its obligations under Section 145 of the Work Health Act 1986. The report includes:

- a review of the experience in the last twelve months
- an assessment of the outstanding claims liabilities of the insured Scheme
- a comparison of the assessed liabilities with the amounts reported by the insurers in their statutory returns
- an assessment of the indicative historical and current "break-even premiums" that we estimate insurers would have needed to charge in order to make neither loss nor profit on the business.

We look forward to presenting our findings to the Committee. In the meantime, please do not hesitate to contact us if you have any questions regarding this report.

Yours sincerely



David Minty



Gillian Harrex

Fellows of the Institute of Actuaries of Australia

Review of Northern Territory Workers' Compensation Scheme as at 30 June 2003

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Part I Executive Summary

1 Purpose and Scope

This report is designed to assist the Scheme Monitoring Committee (the Committee) in monitoring the ongoing viability and performance of the Northern Territory Workers' Compensation Scheme ("the Scheme") and to assist in the monitoring of premium rates. Following review by the Committee and the Minister for Employment, Education and Training, Hon. Syd Stirling MLA, we understand it will be made available for public access in electronic form on the NT Government website.

This Executive Summary highlights the results of our review and particular points of interest from the investigation. It is deliberately brief and should be considered in the context of the report as a whole.

Our previous annual review of the Scheme was carried out at 30 June 2002.

2 Recommendations

1. For a number of years, the employee data provided to NT WorkSafe by participating insurers has been unsatisfactory. It appears that insurers do not supply exposure data on a consistent basis from year to year, resulting in large apparent movements in employee numbers. For this reason, we have been unable to form an accurate assessment of claim frequency (claims per employee) in the Scheme. We recommend that NT WorkSafe review with each insurer the way in which employee data is collected to ensure that it is consistent with other measures of workforce participation in the Territory, noting the differences that may exist between workers' compensation coverage and other employee statistics.
2. We were supplied with a summary of payments in 2003 by head of damage and year of accident, taken from the record of NT WorkSafe Again, the quality of this data is unsatisfactory. The data provided from these records should reconcile with the data provided in Forms A and B by insurers, however, differences of around 5% per annum have been observed for a number of years. We would typically expect reconciliation differences to be less than 1%. These differences add further uncertainty to the result and consequently this data has only been used in a fairly limited fashion. We recommend that NT WorkSafe review the way in which policy and claim data is obtained from insurers so that NT WorkSafe data and that of insurers in aggregate can be readily

- reconciled, as occurs in other Australian workers' compensation systems. This may require major changes to the present data collection system.
3. The way in which premium information is collected means that the Scheme Actuary cannot usefully comment on movements in premium rates at the level of industry groups. We recommend that NT WorkSafe determine with insurers and the Scheme Actuary how such data will be collected and presented to enable the Scheme Monitoring Committee to undertake the requirements of Sections 145 (1) (aa) of the Work Health Act to "monitor premium rates offered for workers compensation in the Territory" and 145 (1A) to "consider and report on the effectiveness of the premiums offered by insurers (a) in encouraging employers to develop and maintain safe working practices; and (b) in penalising employers which do not ensure the maintenance of safe working practices".
 4. As with our previous investigation, this report does not include the claims now being managed by the Nominal Insurer following the collapse of the HIH Group in 2001. We recommend that the Nominal Insurer provide the data from the HIH Group so that the performance of the insured workers' compensation business within the Territory can be accurately understood. Provision of data to the Scheme Actuary to enable comparison with NT Government workers' compensation performance would further enhance comparability with other jurisdictions and transparency of process, and we recommend NT WorkSafe obtain the data required by the Scheme Actuary from the relevant authority.
 5. To provide consistent comparison between our review of the Scheme and the view of insurers, we recommend that all insurers provide NT WorkSafe with (i) gross and net central estimates of outstanding claim liabilities for each of the last 10 accident years and for all prior years combined (showing the amount of claims handling expense allowance separately), (ii) gross and net provisions for outstanding claims for each of the last 10 accident years, and for all prior years combined, as at 30 June each year consistent with each of APRA and AASB1023 reporting, and (iii) an overview of the reinsurance arrangements that protect their NT workers' compensation portfolio. This information is required in addition to the annual actuarial reports on their Territory workers' compensation business now supplied.
 6. To maintain premium rates at around their present levels (or to reduce them), regular review of the Scheme structure by NT WorkSafe in conjunction with stakeholders is required to anticipate and deal with issues affecting scheme cost. Changes to benefit structures, risk management, injury management and claims management should be fully

costed as part of the review process so stakeholders can be fully apprised of the potential effectiveness of changes before they are introduced.

3 Principal Conclusions of our Investigation

7. A comparison of the claim frequencies we have been able to calculate (despite the data difficulties referred to earlier) suggests that there may have been some reduction in claim frequency in the Scheme.
8. Average claim sizes (based on payments in the first eight years after a claim occurs) continue to increase each year. This may indicate either the presence of a relatively high level of superimposed inflation in the Scheme or that the reduction in claim frequency has been due mainly to the elimination of small claims.
9. Our net central estimate of the liability for outstanding claims is \$156 million (see Section 5 below). This is \$26 million higher than the total of the insurers' central estimates shown in their own actuarial reports. Our review of those reports indicates that this may be due to different assessment of the cost of long-term claimants. We note that NT liabilities form a small proportion of the assets of private sector insurers regulated by APRA and that the solvency regime for such insurers has been significantly strengthened in recent years, so the difference may not be a material concern in terms of policyholder protection.
10. We have not made any explicit adjustment to our valuation assumptions for the impact of Scheme reforms introduced in August 2002 as we do not expect that they will have a material impact on existing Scheme liabilities. Any changes will be reflected in future years' emerging experience.
11. Although our assessment of the outstanding liabilities is higher than insurer reserves, allowing for expenses and the cost of servicing the capital required to comply with the requirements of APRA would suggest that business written since the 2000/01 financial year should be returning an adequate (but not excessive) profit for insurers (taken as a whole), as discussed in Section 7.
12. Significant changes in the insurance market in Australia in recent years have affected the willingness of insurers to underwrite classes of business such as workers' compensation. Therefore, we would not expect to see any mitigation in premium rates charged in the NT over coming years. Indeed, the maintenance of premium rates at around their present levels will be dependent on regular review and intervention in the Scheme structure by the Government and NT WorkSafe as issues affecting scheme cost arise, as well as looking to constantly improve risk, injury and claim management practices by employers and insurers.

4 Scheme Experience During 2002/03

Excluding HIH claims, during the financial year ended 30 June 2003:

- Gross claim payments amounting to \$40.6 million were made by insurers, with reinsurance recoveries of \$0.4 million
- Commutation of claims occurring more than eight years ago (tail claims) represented over 20% of payments on such claims compared to 11% of payments on more recent claims, and was the principal source of the reduction in tail claims
- 2,925 new claims were reported to the Scheme, including 3 in respect of accidents or injuries occurring more than eight years ago
- insurers wrote almost \$71 million of premiums
- insurers' central estimates of their outstanding claims liability reached \$129 million.

5 Valuation Results

Our estimate of the Scheme outstanding claim liabilities as at 30 June 2003 is shown in Table 1. The table also compares our assessment of the liability with the total reserves reported in the insurers' Form B returns.

Table 1 – Valuation Results as at 30 June 2003

	Trowbridge	Insurers
	\$000	\$000
Gross Central Estimate ¹	159,085	
<i>less</i> Reinsurance Recoveries ²	(3,182)	
Net Central Estimate	155,903	129,571
<i>plus</i> Claims Handling Expense ³	9,354	
	165,257	
<i>plus</i> Prudential Margin ⁴	24,789	
Total Provision ⁵	190,046	142,052

¹ Allows for future inflation of 9% pa (incorporating normal wage related inflation of 4% pa and superimposed inflation of 5% pa), and is discounted at 5% pa

² 2% of gross claim payments

³ 6% of net central estimates

⁴ 15% of net central estimates plus expenses

⁵ We were not supplied with the provision figure for one major insurer

For the first time this year, we were provided with insurers' central estimates of claim liabilities, and in some cases, the provisions were included in their accounts. One large insurer only provide details of the central estimate of

claims liabilities and so it is not possible to compare the provisions actually held in the insurers' accounts with our total provision on a 'like with like' basis.

We have made the following changes to the actuarial assumptions used in our last valuation, based on our analysis of the Scheme's emerging experience.

- We reduced our allowance for superimposed inflation in the 'tail' (claims more than 8 years since accident date) from 5% per annum to 3% per annum, following a re-evaluation of the emerging experience of the Scheme and increased the expected annual rate of tail claim closure from 19% to 20%
- Offsetting this to some extent, the discount rate was reduced from 6% per annum to 5% per annum, reflecting a decrease in the yields available on Commonwealth Government bonds between June 2002 and June 2003
- We have reduced the allowance for claims handling expenses to 6% per annum (Previously 10% per annum)
- The assumed average claim sizes and payment patterns have been modified, although by relatively small amounts
 - The average size applying in the first eight development years is \$12,310. This is almost identical to the assumed size from the previous valuation (with the addition of one year's wage and superimposed inflation)
 - For the "tail" we have adopted an average claim size of \$1,700 for accident years up to and including 1998/99, and \$1,950 for accident years 1999/00 and later. This represents a reduction in the tail assumptions, after allowance for one year's wage and superimposed inflation.

We have maintained the following assumptions used in last year's investigation:

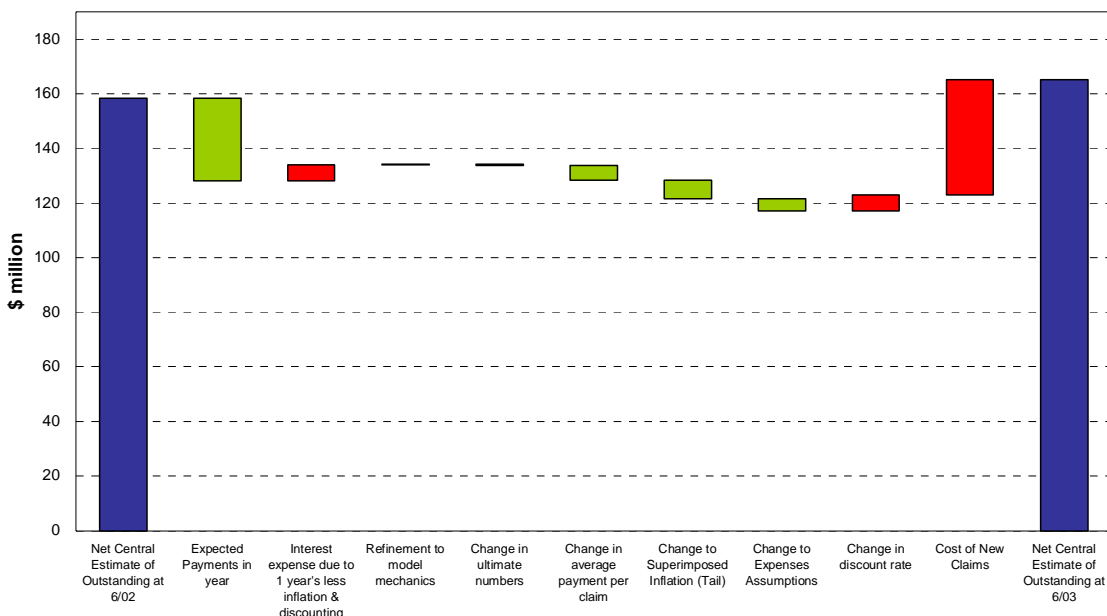
- reinsurance recoveries of 2% of gross claim payments
- combined inflation (both normal and superimposed) of 9.0% per annum in the first 8 years
- a prudential margin of 15% of the net central estimate including claim handling expenses.

6 Movement in Incurred Claims Cost

Table 1 shows our net central estimate of the outstanding claim liabilities is \$165 million, including claims handling expenses. As at 30 June 2002 the net central estimate was \$158 million.

Figure 1 below shows the impact of the various changes in assumptions on the net central estimate of liabilities (including expenses).

Figure 1 – Movement in Net Central Estimate (including expenses)



The primary sources of increase are through the “unwind” of the discount (as the payments are one year closer to payment) and the addition of a new year’s claims. The other changes have a relatively small impact on the movement in the liability.

The primary sources of increase are through the reduction of the discount (as claims are one year closer to settlement) and the addition of a new year’s claims. The other changes have a relatively small impact on the movement in the liability.

7 Comparison of Premiums to Costs

Table 2 below compares our estimate of the “Break-even Premium” with the actual average rate charged (calculated from the insurer Form B returns). The break-even premium is the amount we estimate insurers need to charge to cover claims costs and expenses. Note that information relating to the HIH Group has been excluded from the analysis for all prior years.

Table 2 – Estimated “Break-even Premiums” compared to Premiums Charged

Accident Year	Wages ¹	Gross Incurred Costs ²	Expenses, Commission	"Break-even Premium Rate"	Average Prem Rate charged by Insurers
	\$m	\$m	\$m	%	%
1998	1,437	34.1	6.6	2.8	1.6
1999	1,586	39.1	7.6	2.9	1.9
2000	1,859	39.2	7.5	2.5	2.4
2001	1,924	40.0	7.7	2.5	2.9
2002	2,130	43.6	8.3	2.4	3.1
2003	2,170	47.5	9.1	2.6	3.2
2004 ³ (forecast)	2,256	51.1	9.8	2.7	

1 Source: ANZSIC Data supplied to Worksafe by Insurers in Annual Returns- excluding HIH Group

2 Including 4% inflation, 5% superimposed inflation, and discounted to middle of accident year at 5% pa

3 Assumes 4% wageroll growth, 0% growth in claim numbers, 5% pa discount rate, 4% inflation, 5% superimposed

The actual rate charged by insurers has stabilised over the last two or three years. Based on our assessment, we expect that business written since 30 June 2000 should ultimately be profitable for insurers (as a whole) after allowing for the need to establish margins in provisions in excess of the central estimates as required by APRA. However, because of the long-tail nature of this class of business, the final result will not be known for many years.

We have the following comments on the break-even premium analysis:

- Allowing for expenses and the cost of capital would suggest that business written since the 2000/01 financial year should be returning an adequate (but not excessive) profit for insurers (taken as a whole)
- The break-even premium is estimated to be reasonably stable in recent years, despite the existence of superimposed inflation in the Scheme. One possible explanation is the steady reduction in the number of claims being reported.

Allowing for expenses and the cost of servicing the capital required to comply with the requirements of APRA would suggest that business written since the 2000/01 financial year should be returning an adequate (but not excessive) profit for insurers (taken as a whole).

8 Uncertainty

Estimation of outstanding claims liabilities is not an exact science. The estimation of future payments is inherently imprecise, particularly with respect to liabilities settled over lengthy periods of time. Although we have prepared estimates in conformity with what we believe to be the likely future experience, the experience could vary considerably from our estimates.

Additional information will be revealed over time and those estimates and assumptions will be revised resulting in gains or losses in future periods. Our estimated liabilities together with a prudential margin are intended to assist the understanding of the operation of the business in light of this uncertainty.

9 Reliances and Limitations

We have relied on data provided by NT WorkSafe. While we have conducted reasonableness checks regarding the accuracy of the information we have not independently verified it, and have noted a number of issues as set out in our recommendations above. Material errors or omissions in the information provided may materially impact our estimates.

The nature of workers' compensation liabilities means that there is inherent uncertainty in any estimates of outstanding claim liabilities. Variations over time are normal and are to be expected.

The purpose of the report is outlined in Section 1 above. It is not intended for any other purpose. In particular, sections of the report that analyse premium adequacy, are intended as a monitoring tool only. Use of this information for any other purpose (eg. premium pricing) is not appropriate.

The report should be considered as a whole. Consultants from Trowbridge Deloitte are available to answer any queries, and the reader should seek such advice before drawing conclusions on any issue in doubt.

This report is intended for the use of the Scheme Monitoring Committee. While it may be included on the NT Government website as an aid to understanding the development of the Scheme, Trowbridge Deloitte accepts no responsibility for any action by third parties which may be taken based on any aspect of this report.

10 Accounting and Professional Standards

The following prudential and professional standards are relevant to the preparation of reports regarding insurance company outstanding claim liabilities:

- APRA's Prudential Standard GPS210 – Liability Valuation for General Insurers
- IAA's Professional Standard 300 – Actuarial Reports and Advice on General Insurance Technical Liabilities

- IAA's Guidance Note GN353 - Evaluation of General Insurance Technical Liabilities.

Further, the accounting standard AASB1023 has implications for the way in which entities set provisions for outstanding claims.

This investigation and report are intended to comply with these Standards and Guidance Notes to an extent that we consider reasonable, given the purpose of our investigation.

11 Glossary of Terms

Appendix G includes a Glossary of Terms that are used throughout the report and this Executive Summary.

Part II Detailed Findings

1 Introduction

We have been asked by the Scheme Monitoring Committee (the Committee) to make an assessment of the Northern Territory Workers' Compensation Scheme (the Scheme) at 30 June 2003. The purpose of the investigation is to assist the Committee in fulfilling its obligations under Section 145 of the Work Health Act 1986 (the Act) to:

- monitor the viability and performance of the Workers' Compensation Scheme, and
- monitor the premium rates offered for Workers' Compensation in the Territory.

1.1 Purpose and Scope

This report is to assist the Scheme Monitoring Committee (the Committee) in monitoring the ongoing viability and performance of the Northern Territory Workers' Compensation Scheme ("the Scheme") and to assist in the monitoring of premium rates. Following review by the Committee and the Minister for Employment, Education and Training, Hon. Syd Stirling MLA, we understand it will be made available for public access in electronic form on the NT Government website.

This is the sixth annual Scheme report that Trowbridge Deloitte has prepared for the Committee. Our previous report as at 30 June 2002 is hereafter referred to as "the previous investigation".

1.2 Structure of the Report

The report is set out as follows:

1. Introduction
2. Scheme and Insurance Environment
3. Valuation Approach & Assumptions
4. Economic & Other Assumptions
5. Outstanding Claims Valuation

6. Premiums
7. Sensitivity of Results
8. Reliances & Limitations

The report is supported by a series of technical appendices.

1.3 Accounting and Professional Standards

The following prudential and professional standards are relevant to the preparation of reports regarding insurance company outstanding claim liabilities:

- APRA's Prudential Standard GPS210 – Liability Valuation for General Insurers
- IAA's Professional Standard 300 – Actuarial Reports and Advice on General Insurance Technical Liabilities
- IAA's Draft Guidance Note GN353 - Evaluation of General Insurance Technical Liabilities.

Further, the accounting standard AASB1023 has implications for the way in which entities set provisions for outstanding claims.

This investigation and report are intended to comply with these Standards and Guidance Notes to an extent that we consider reasonable, given the purpose of our investigation.

1.4 Data Provided

We have been provided with copies of the Form A and B returns submitted by the authorised insurers, and have relied on the accuracy of the information provided in these returns. We were also supplied with extracts or copies of the actuarial investigations at 30 June 2003 for participating insurers.

For a number of years, the employee data provided to Worksafe by participating insurers has been unsatisfactory. It appears that insurers do not supply data on a consistent basis from year to year, resulting in large apparent movements in employee numbers. For this reason, we have been unable to form an accurate assessment of claim frequency (claims/employees) in the Scheme.

We were also supplied with a summary of payments in 2003 by head of damage and year of accident, taken from the record of WorkSafe. Again, the quality of

this data is unsatisfactory. The data provided from these records should reconcile with the data provided in Forms A and B by insurers, however, differences of around 5% per annum have been observed for a number of years. We would typically expect reconciliation differences to be less than 1%, These differences add further uncertainty to the result and consequently this data has only been used in a fairly limited fashion.

Further explanation of the data provided is provided in Appendix A.

2 Scheme and Insurance Environment

2.1 Scheme Benefits

The Scheme provides a range of benefits to injured workers, including:

- weekly income-replacement benefits, related to pre-injury Normal Weekly Earnings (NWE)
- all reasonable medical and related expenses
- lump sum impairment benefits, to the more seriously injured claimants
- limited access to commutations and redemptions of future benefits
- lump sum death benefits, and weekly benefit to dependents.

There has been no access to common law benefits since inception of the Scheme in January 1987.

2.2 Recent Legislative Changes

During 2002/03, amendments were made to the Act. These changes include:

- an increase in death benefits
- tying benefits payable more than two years after an accident to a claimant's capacity to work
- increasing the focus on rehabilitation and return to work procedures.

At this investigation we have not made any explicit allowance for the impact of these reforms, as we are yet to observe the impact of these changes, and we would expect any impact to be limited to the most recent accident year.

2.3 Insurance Environment

In recent times there has been considerable change to the insurance environment in Australia. Significant elements include:

- consolidation of insurance companies into a smaller number of groups, resulting in fewer providers in many classes of insurance, including workers' compensation. For instance, AMP, CGU, FAI, GIO, HIH, Lumley, SGIC, SGIO and SIO have all ceased independent operation in the last 10 years.

- a corresponding reduction in the number of insurers operating in regions, such as the Northern Territory, particularly with the collapse of HIH and FAI as well as the CGU merger with IAG
- increases in premium rates in most commercial classes of insurance following poor results and reduction in market capacity in both Australia and overseas from incidents such as 9-11, natural disasters, increasing liability claim costs and previous chronic underpricing of this business
- significant increase in the level of regulatory scrutiny from the Australian Prudential Regulation Authority (APRA) and other government agencies following the collapse of HIH and other corporations.

Each of these changes has affected the willingness of insurers to underwrite classes of business such as workers' compensation, and so we would not expect to see any mitigation in premium rates charged in the NT over coming years. Indeed, the maintenance of premium rates at around their present levels will be dependent on regular review and intervention in the Scheme structure by the Government and WorkSafe as issues affecting scheme cost arise, as well as constantly improving injury and claim management practices by insurers.

3 Economic & Other Assumptions

Table 3.1 provides a summary of the economic and other assumptions used in this investigation and the previous review. The basis for these assumptions is described in this section.

Table 3.1 – Summary of Economic and Other Assumptions

	This Valuation	Previous Valuation
	%pa	%pa
Discount Rate	5.0%	6.0%
Wage Inflation	4.0%	4.0%
Superimposed Inflation years 1-8	5.0%	5.0%
Superimposed Inflation in tail ¹	3.0%	5.0%
Reinsurance Recoveries ²	2.0%	2.0%
Claims Handling Expenses ³	6%	10%
Prudential Margin ⁴	15%	15%

¹ previously same rate applied throughout

² Percentage of gross central estimate

³ Percentage of net central estimate

⁴ Percentage of net central estimate plus claims handling expenses

3.1 Discount Rate

We consider it reasonable for valuation purposes to use a single discount rate for all future years in calculating the present value of expected future claim payments. To comply with the general insurance prudential standard GPS210 (governing the measurement and reporting of the insurance liabilities for general insurers) and AASB1023 (the relevant accounting standard), we believe this rate should be:

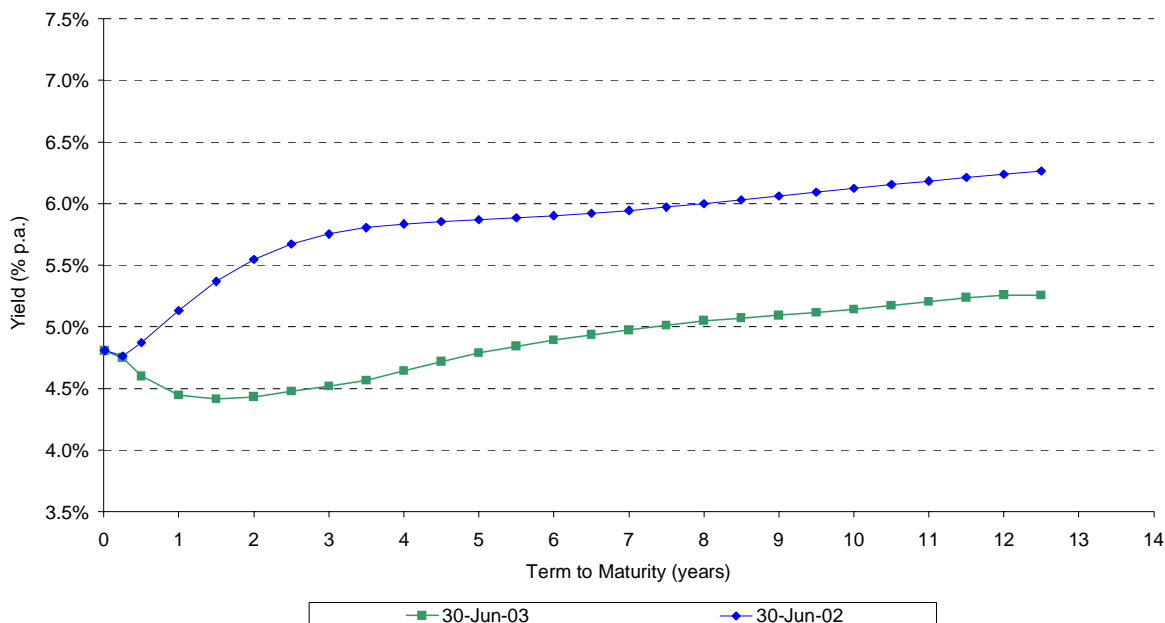
- a current rate - it should reflect market conditions at the valuation date
- a prospective rate - it represents the rate which can be earned between the balance date and when claims are settled (not the rate which has been earned in the past)
- risk adjusted - to reflect the level of risk in a portfolio of assets that would closely match the liabilities. The appropriate rate is a risk free rate corresponding to the duration of the liabilities.

Our selected discount rate is based on an empirical analysis of the yield curve for Government Bonds comparing the yield and the average duration of the underlying liability payments. The duration is a weighted average measure of the time over which payments are made. (Based on our analysis of the

Scheme’s experience, the average duration of the liabilities is approximately six years.)

Figure 3.1 sets out the of bond yields at June 2002 and June 2003.

Figure 3.1 – Government Bond Yields



The analysis shows that the yield curve at June 2003 has decreased substantially from that at June 2002. Based on the anticipated pattern of future payments, we view it appropriate to use a discount rate of 5.0% pa for the valuation of outstanding claims liabilities at 30 June 2003. This rate is 1% lower than the rate used in last year’s investigation.

All other assumptions being unchanged, such a reduction will increase the outstanding claim liabilities. However, as an insurer’s assets are included in its accounts at market value, if the insurer were holding a matched portfolio of government bonds, the value of its assets would also rise and so the net effect on its profitability should be minimal.

For the purposes of comparing premiums and claims costs, we have also adopted a discount rate of 5.0% pa. (This comparison is discussed in Section 6.)

3.2 Wage Inflation

It is usual to relate increases in workers’ compensation claim costs to wage inflation as many of the benefits payable increase with movements in wages.

As with the discount rate, we consider it reasonable for valuation purposes to use a single rate for all future years.

The differential between the assumed future inflation and discount rates ('the gap') is more important in determining the value of outstanding claims than is the absolute level of each rate.

Future forecasts for wage inflation over the next few years are generally in the range of 3.5% to 4.5% per annum. At this investigation we have continued to assume a normal inflation rate of 4.0% pa for the future duration of incurred claims. This rate has been used in both the valuation of outstanding claims and the comparison of claims cost to premiums.

A selected rate for wage inflation of 4.0% per annum produces a gap of 1.0% with the discount rate. We believe a gap of 1% is at the lower end of the range of gaps that would generally be adopted by actuaries valuing such liabilities in Australia at the present time.

3.3 Superimposed Inflation

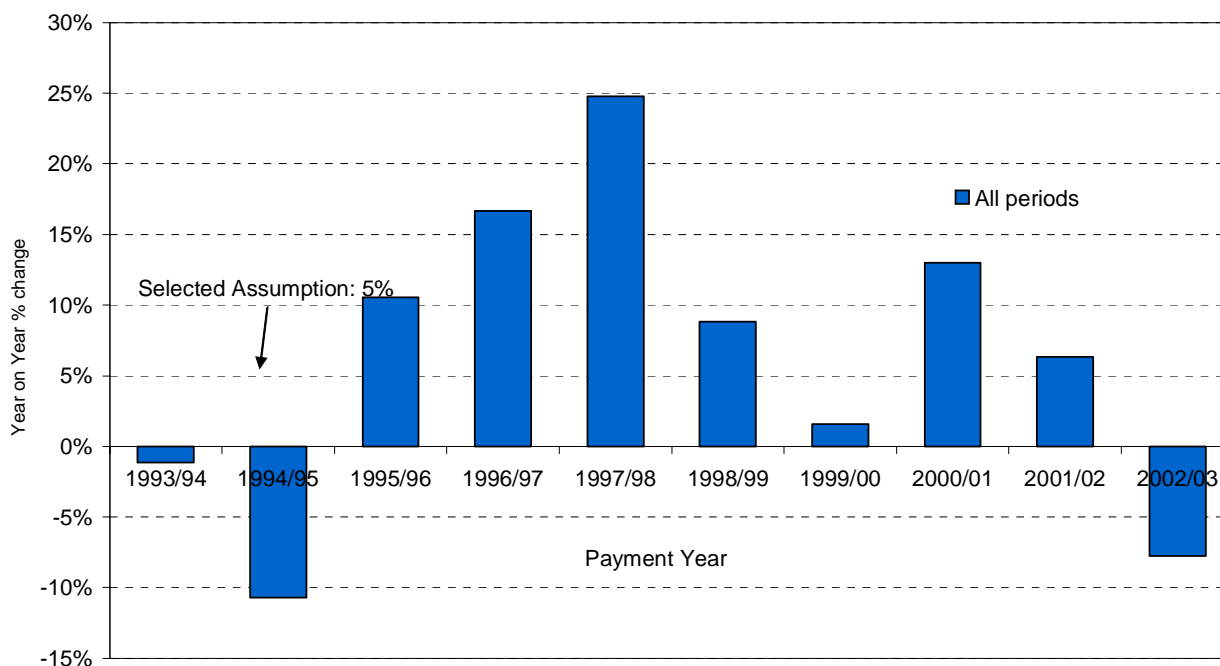
Superimposed inflation represents the tendency of claims cost to increase above the rate of wage inflation over time. This is often the result of the combined effect of various economic, social and political forces that do not easily lend themselves to forecasting.

We have expressed this "above wage inflation" growth in claim costs (superimposed inflation) as an average annual rate.

Our analysis of the Scheme's experience continues to reveal evidence of superimposed inflation on claim costs. Determining an appropriate assumption for future superimposed inflation however is very difficult as experience in recent years has exhibited significant volatility, both by accident year and development year. Some of this volatility could be due to other factors such as commutation activity.

Figure 3.2 below shows historical rates of superimposed inflation over recent years, measured by comparing the progression of average payment per claim incurred (PPCI) measured on a payment year basis. (The calculation of the PPCIs is discussed in Section 4.)

Figure 3.2 – Superimposed Inflation in Recent Years



As shown in Figure 3.2, the historical superimposed inflation experience is highly volatile, with periods of low or negative change and others of very high movement. This necessarily makes the selection of an assumption regarding future levels highly judgemental.

We consider that maintaining an assumption of 5% pa for the first 8 years is appropriate, and is not inconsistent with the most recent experience. However, for claims that have developed beyond year 8 we believe it may be appropriate to reduce the superimposed inflation assumption to 3% pa. Claims beyond this time are generally in receipt of weekly benefits, with an additional component of medicals, rehabilitation etc and so it is possible that the rate of superimposed inflation in the tail may be somewhat lower than in early years of development. This is discussed further in Section 4.5. (We note also that the 2002 amendments to the legislation may act to reduce the upward cost pressure, although we have not performed any specific costing of these reforms).

3.4 Claims Handling Expenses

In setting the provision for outstanding claims, an appropriate allowance should be made for the future cost of internal claim handling expenses. (External claim handling expenses such as medical and legal fees are already allowed for in expected future claim payments)

Table 3.2 summarises the expense information for the Scheme as a whole from the Form A's supplied by the insurers. Note that this analysis has been conducted with the HIH Group data removed, as these claims have become the responsibility of the Nominal Insurer and are not included in this valuation.

Table 3.2- Historical Expense Levels

Financial Year	Net Earned Premium	Net Claims Paid	Expenses	Commission	Expenses	Commission
	(1)	(2)	(3)	(4)	as % of (2)	as % of (1)
	\$000	\$000	\$000	\$000	%	%
1997/98	28,311	31,860	4,789	842	15.0	3.0
1998/99	31,987	33,350	5,210	424	15.6	1.3
1999/00	44,148	36,819	4,947	1,264	13.4	2.9
2000/01	52,432	42,697	5,039	2,089	11.8	4.0
2001/02	60,149	38,251	6,301	2,482	16.5	4.1
2002/03	66,165	40,155	7,436	2,458	18.5	3.7
Average (last 3 yrs)	59,582	40,368	6,259	2,343	15.5	3.9

For the outstanding claims valuation, we have reduced our assumption for claims handling expenses from 10% to 6% of claims paid, following our review of assumptions generally adopted by insurers in their actuarial reports. This is lower than the average figure shown in Table 3.2 because many of the expenses included in the table are incurred in establishing claims, writing business and administering policies rather than to meet the ongoing costs of administering claims.

In estimating premiums, all expenses and commission costs need to be included. For this purpose, we have adopted a total allowance of 15% of net claim payments for expenses and 4% of premiums for commission. These assumptions are unchanged from our previous investigation.

3.5 Reinsurance Recoveries

Each insurer has a reinsurance program in place to protect it in years of adverse experience. We have not been provided with details of these programs. Table 3.3 summarises some recent reinsurance experience of the Scheme (taken from individual insurers' Forms A).

Table 3.3 – Reinsurance Recoveries

Financial Year	Gross Written Premium	Reinsurance Premium	Reinsurance as % Gross Premiums	Gross Claims Paid	Reinsurance Recoveries	Recoveries as % Gross Claims Paid
	\$000	\$000	%	\$000	\$000	%
1997/98	29,036	2,432	8.4	32,980	1,120	3.4
1998/99	40,549	5,120	12.6	35,353	2,003	5.7
1999/00	54,114	5,064	9.4	40,469	3,650	9.0
2000/01	65,467	6,041	9.2	44,638	1,941	4.3
2001/02	66,903	1,535	2.3	38,683	432	1.1
2002/03	70,557	2,221	3.1	40,584	429	1.1
Average (last 3 yrs)	67,642	3,266	4.8	41,302	934	2.3

At this investigation we have assumed future reinsurance recoveries of 2% of gross claim payments. This is the same rate assumed at last year's investigation.

For the purposes of comparing premiums and claims costs, we have also adopted a reinsurance recovery rate of 2.0% pa. (This comparison is discussed in Section 6).

3.6 Prudential Margin

The estimate of liabilities we have produced in this report can be described as a "central estimate" of the outstanding claim liabilities. The valuation assumptions have been selected to yield estimates with no deliberate bias towards either over-estimation or under-estimation.

Variations between our estimates and the ultimate cost of claims, measured on a consistent basis, arise for a number of reasons:

- models chosen for analysis and projection are unlikely to exactly match the actual claim process
- random fluctuations in the claims experience (or undetected errors in the data) result in uncertainty in assumptions regarding future experience
- future economic and environmental conditions are not known and may be different from those experienced in the past
- future random claim fluctuations will result in uncertainty in the projected payments.

Each of the potential sources of variation introduces uncertainty into the valuation process.

In view of the uncertainties inherent in the valuation process, the view that sound commercial management requires that provisions held in the accounts should be more than 50% likely to be adequate, and the requirements of APRA regarding the holding of risk margins for solvency calculation purposes, we recommend that prudential margins be added to the central estimates of liabilities in considering the performance of the Scheme.

Reference to Prudential Standards

Effective from 1 July 2002, the minimum capital requirement calculation for general insurers is based on insurance liabilities including risk margins designed to provide a 75% probability of sufficiency.

The reserves recorded in the insurer financial statement may differ from the amounts used for the APRA capital calculation, and we understand that it is not unusual for insurers to hold a higher amount in the balance sheet – an amount designed to provide a higher than 75% probability of sufficiency.

Our Approach

While it is feasible to conduct a risk margin analysis for the Scheme liabilities, it is problematic given that the Scheme comprises a number of insurers of various sizes, with differing reinsurance arrangements and diversification benefits.

From the data provided by insurers, there is a large range in the risk margins held – from around 8% of central estimates to over 30%. Overall, the risk margins disclosed were approximately 13% of central estimates (excluding the one insurer that did not disclose its margin). This is equivalent to 9.6% of total insurer reserves.

We would expect that APRA risk margins would typically be lower than the 15% prudential margin we have assumed, particularly for the larger underwriters where they will generally benefit from the ability to reduce their risk margins to account for the diversification benefit of writing a range of classes of business. However, considering the Scheme in isolation, we believe it is appropriate to include a margin of 15% for the purpose of this investigation (monitoring against insurer reserving and premiums). This position will be reviewed at the June 2004 valuation when we propose gathering additional information from insurers regarding reserving practices and the loadings applied to the central estimate.

④ Valuation Approach, Experience and Assumptions

4.1 Treatment of HIH

For the purposes of projecting the outstanding claims liability, it is appropriate to exclude any liability in respect of claims now being handled by the Nominal Insurer, following the collapse of the HIH Group (including HIH, FAI and WMG).

We have considered the historical experience both with and without HIH as part of this valuation, although the bulk of our analysis is conducted with data excluding HIH. The selected experience development factors and average claim sizes are similar on a “with” and “without” HIH basis.

HIH was a significant underwriter in the NT Scheme. This is illustrated in Figure 4.1 which shows the estimated ultimate number of claims arising in each accident year. The chart shows the estimates from our current valuation, overlaid with our estimates of HIH’s claim number, based on our valuation at 30 June 2001.

Figure 4.1 – Ultimate Claims With & Without HIH

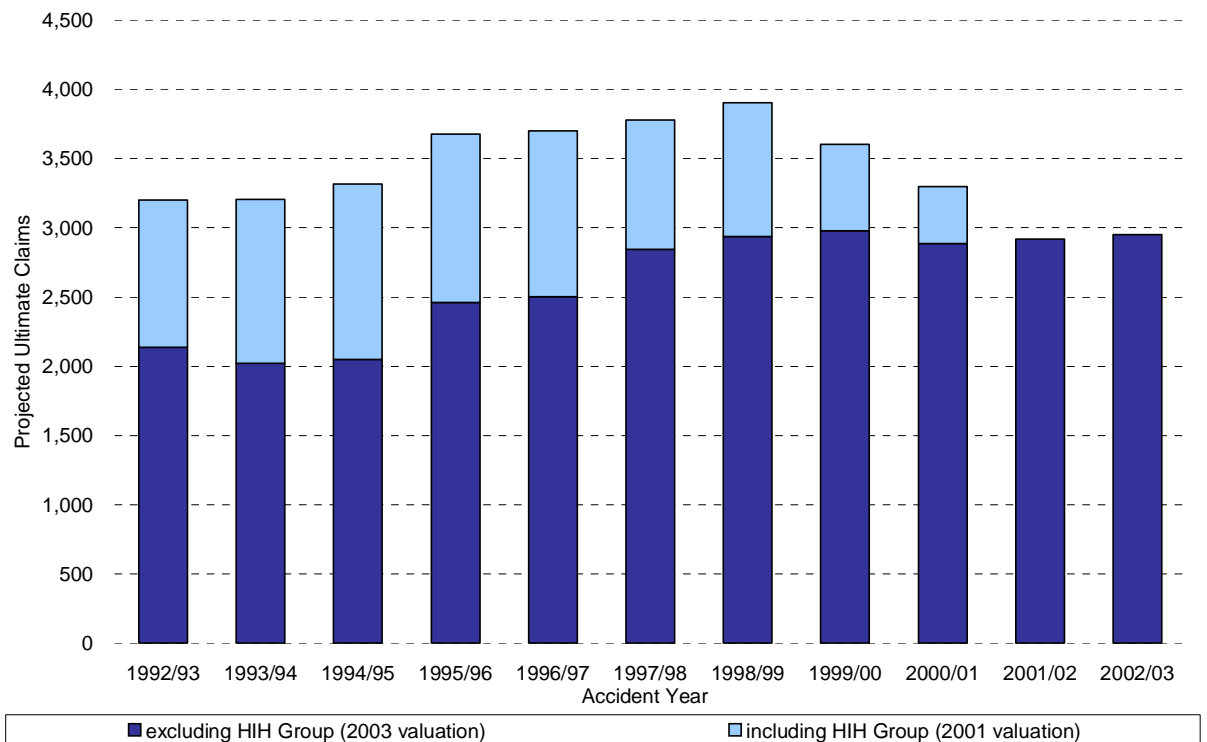


Figure 4.1 shows that HIH typically managed around 30% of claims in the mid 1990's, although the share diminished significantly in the years leading up to the collapse of the Group.

A particular point of interest in this graph is that even after allowing for the 're-introduction' of employers formerly insured with HIH in 2001/02 and 2002/03, the number of claims reported in the latest two years is lower than prior years. Given the size of the NT workforce has continued to increase in recent years, this is an encouraging sign that frequency may be reducing.

Observations on the trend in the number of claims reported are discussed further in Section 4.4.

4.2 Valuation Approach

We have valued the Scheme liabilities using a model and set of assumptions selected taking into account past experience and our own assessment of likely future experience. The analysis is based on data excluding the HIH Group, as the Nominal Insurer has assumed these liabilities.

We have, as in previous years, used the Payment Per Claim Incurred (PPCI) method in deriving our estimate of the outstanding claims liability. The PPCI method requires assumptions regarding:

- the number of claims ultimately arising in each accident year
- the average claim size
- the spread of payments over time (the payment pattern).

Future payments for each accident year are projected by multiplying together:

- the ultimate number of claims incurred
- the assumed payment per claim incurred in each future development period. This is based on the assumed average claim size and the payment pattern – how rapidly we expect claims to be paid
- an inflation index based on the projected rates of claims inflation (both wage and superimposed).

The present value of the liabilities is calculated by discounting the projected future payments to the valuation date at an assumed discount rate.

An important factor in determining the liabilities of the Scheme is the timing and magnitude of payments in the “tail”. While for practical purposes we have adopted the PPCI valuation method for the tail projection, we have constructed a special tail model to generate the PPCI assumptions.

The purpose-built tail model combines explicit assumptions regarding the rate of claim closure and the average payment to open claims in the tail to produce equivalent PPCI assumptions for the tail.

Future payments on tail claims are projected in current values for each accident year by multiplying together:

- the average number of tail claims that were open in the year having regard to the assumed rate of claim closure during the year, and
- the average annual payment made to such claimants.

The current value projected payments are then converted to a PPCI-equivalent by dividing them by the ultimate number of claims incurred in the relevant year. On the basis of the equivalent PPCIs for each year, one or more tail PPCI assumptions are selected. (For this valuation two tail PPCIs have been selected: one which applies to accident years 1998/99 and prior, and another which applies for years thereafter. This is discussed in Section 4.6).

4.3 Legislative Changes

As noted in Section 2, the governing legislation was amended in 2002. Changes included:

- an increase in death benefits
- linking the benefits beyond two years to a claimant's capacity to work
- increasing the focus on rehabilitation and return to work procedures.

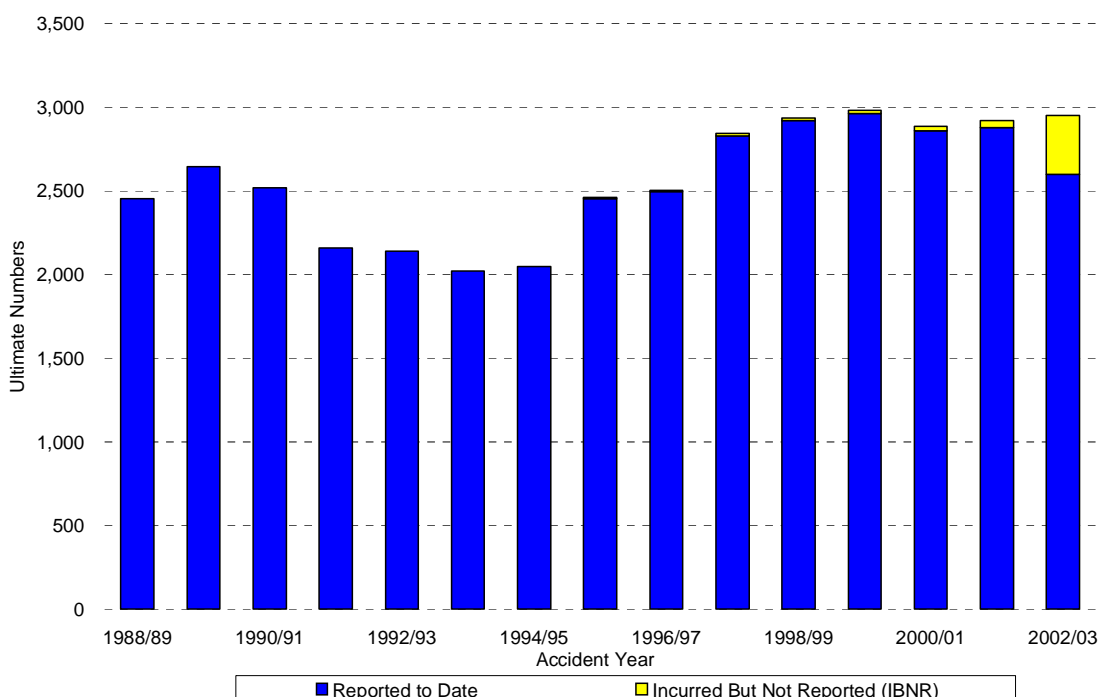
Our analysis of the historical Scheme experience is largely unaffected by these changes, given their recent introduction. We have considered the nature of the changes, and their likely impact on the liability for claims incurred prior to 30 June 2002. We believe the changes are unlikely to have any significant impact on the size of these liabilities, being primarily focussed on future claims.

On the basis of this assessment we have not explicitly adjusted the valuation assumptions from those that are indicated by the historical experience and our interpretation thereof. Any improvements brought about by the changes will thus be gradually incorporated into our valuation basis as they emerge in the experience of the Scheme.

4.4 Valuation Assumptions: Numbers of Claims Incurred

Figure 4.2 shows our estimates of the ultimate number of claims incurred in each accident year (excluding HIH business). The chart shows both the number of claims reported to date and the estimate of claims that are Incurred But Not yet Reported (IBNR).

Figure 4.2 – Projected Ultimate Claim Numbers



The apparent trend in Figure 4.2 to a plateau in numbers of claims in the last five years is a little misleading because of the varying market share of HIH in recent years. As shown in Figure 4.1 at the beginning of this Section of the report, the number of total claims in the Scheme (including HIH in past years) has shown a reducing trend in recent years.

We estimate there will be approximately 2,950 claims in respect of the 2002/03 accident year. We have made a number of minor changes to the reporting pattern, in line with the emerging experience.

We would ideally compare the number of claims with the exposed workforce to establish the claim frequency. Unfortunately the employee number data provided to us from the insurer data collected by WorkSafe is incorrect, and we have therefore not been able to undertake this analysis. These numbers have been incorrect for a number of years. The shortcomings of the employee count are discussed in Appendix A.

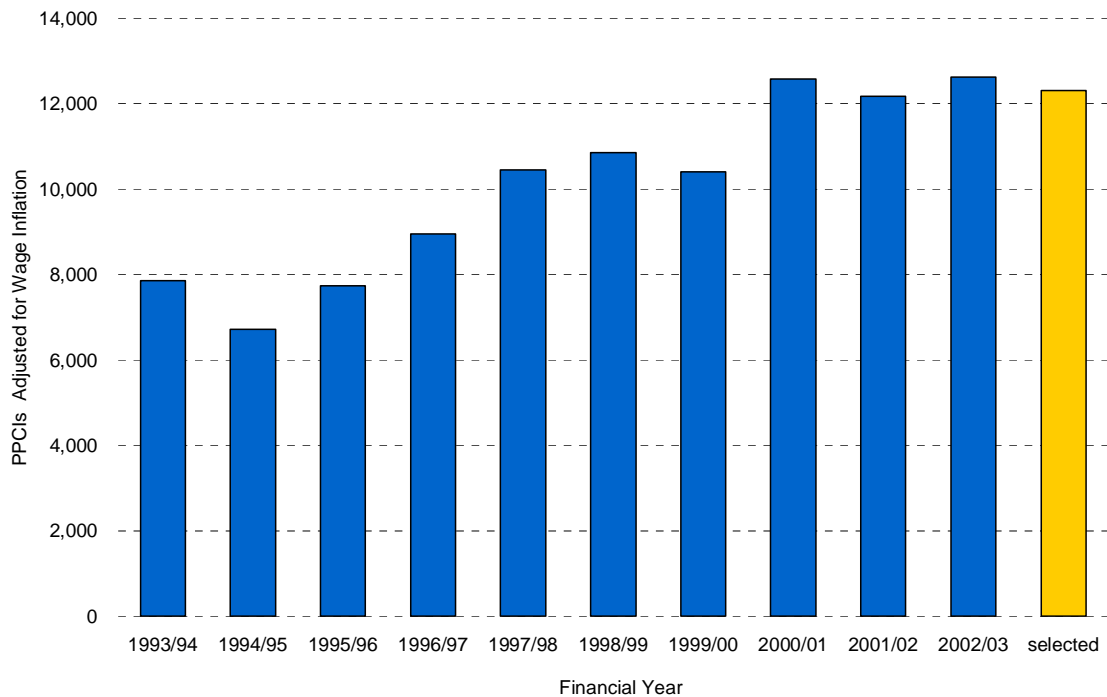
4.5 Valuation Assumptions: Average Claim Size excluding the Tail

Figure 4.3 shows the historical PPCIs calculated on a financial year basis, and adjusted for historical wage inflation. Note that only the first eight development years of experience are included in this part of the analysis as the tail is

considered separately. The chart shows a strong increasing trend in the average claim size in each year, indicating the presence of a relatively high level of superimposed inflation in the Scheme or that the reduction in claim frequency has been due mainly to the elimination of small claims.

The last column on the chart shows our selected PPCI for the first eight development years (the tail PPCI is discussed below).

Figure 4.3 – Payments per Claim Incurred excluding “Tail” Payments

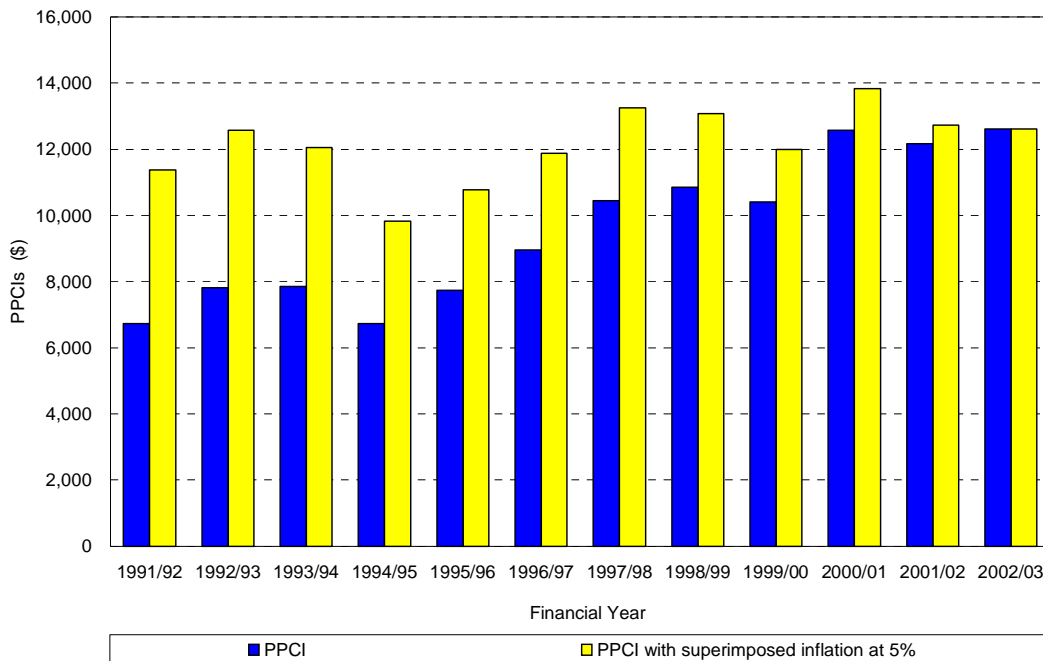


The information shown in Figure 4.3 is slightly different to that underlying the calculation of historical superimposed inflation shown in Figure 3.2. The calculation of superimposed inflation in Figure 3.2 is also based on the progression of PPCIs over time, but includes all development years. The information in Figure 4.3 relates only to the *first eight development years only*. The pattern is slightly different when tail payments are included.

We have assumed a current value PPCI for the first eight development years of \$12,310. This is consistent with the recent experience, after allowing for historical superimposed inflation at our assumed level.

Figure 4.4 below shows the same information as Figure 4.3, but with adjustment for historical superimposed inflation at an assumed rate of 5% per annum.

Figure 4.4 – Effect of Superimposed Inflation on the Historical PPCIs



The average size adopted at the previous valuation was \$11,300. This is equivalent to \$12,310 restated to current values by adjusting for assumed wage and superimposed inflation.

The assumed PPCI for the first eight development years is therefore almost identical to the equivalent value from the previous valuation. The payment patterns are also largely unchanged. In selecting the PPCI and the payment patterns, we have examined the recent experience of the scheme, and adopted patterns that reflect this experience. (The derivation of the PPCI valuation assumptions is set out in Appendix E).

4.6 Valuation Assumptions: The Tail

Selection of valuation assumptions for the tail is made more difficult by the shortage of development history. Prior to 2000/2001, the insurer statutory returns grouped all accident years more than 8 years old. For the last three years, 15 individual years are shown, with grouping of all prior years. The short available history of the development of claims beyond year 8 means that it is difficult to properly analyse the continuance experience in the tail. This will become more feasible as the number of years of returns with the 15 year run-off grows.

Commutations

Commutations are a feature of the Scheme which affects the size and pattern of payments over time. The data provided to us for this valuation indicates that there were 119 payments under Section 74 (Commutations) during the year, totalling \$10.3 million. Of this amount, 20.5% is paid in respect of tail claims (those which are more than eight years old). This is much higher than other types of payment, where only 11% of payments in the 2002/03 year relate to tail claims.

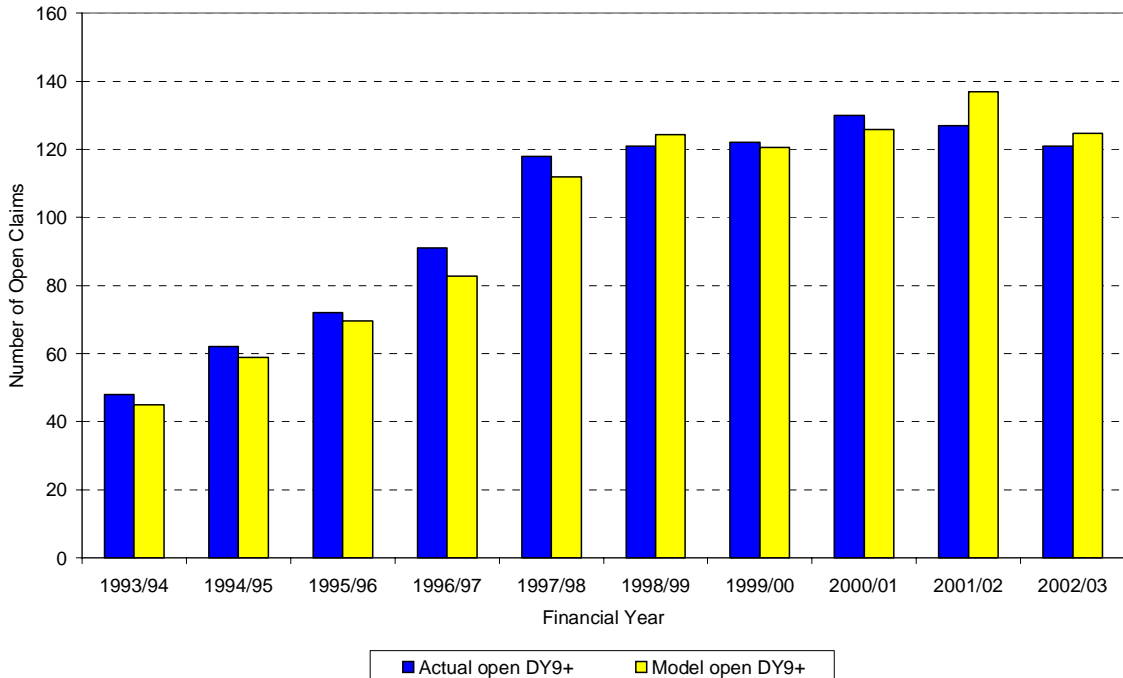
The commutation activity in the tail is a significant factor in the run-off of the tail claim costs. They increase both the rate of claim closure and the total payments in the short-term, as they effectively “bring forward” a number of years’ claim payments to a single year. We have taken the commutation experience into account when modelling the closure rate and average size of claims in the tail.

Rate of Claim Closure

As in previous years, we have assumed that the stock of open claims will take around 30 years to fully run off, as many tail claimants are on weekly benefits with the potential to remain on benefit until age 65, and can continue to receive medical benefits for the remainder of their lives.

We have examined the recent experience and modelled open claim numbers to select an appropriate closure rate for the tail valuation. The selections are tested by “projecting” historical numbers of open claims and comparing them with the actual results. Figure 4.5 compares the modelled open claims to actual open claims.

Figure 4.5 – Actual vs. Modelled Open Claims for Development Years 9 & Higher



At this investigation we have assumed a tail claim closure rate of 20% per annum. This represents a 1% increase from last year’s valuation and reflects the effect of the increasing activity in commutations. At this point in time we have taken a cautious approach to the selection of this assumption; however it is possible that this rate could increase further in the future. The actual closure rate will vary from year to year depending on the number of commutations, changes in claim management activity, etc.

Average Payments to Open Tail Claims

On the basis of the analysis conducted in previous years, and the analysis set out in Appendix E, the average payment on open claims in the tail in recent years is in the range of \$30,000 to \$40,000 each year that they remain open.

At this investigation, we have increased the average payment per open claim to \$35,000 per annum. At the previous valuation, we used a payment per open claim of \$33,280 (equivalent to \$34,611 after adjusting to 2002/03\$). Reviewing the more recent evidence suggests that the rate of payment is increasing faster than the rate of wage inflation, although not as fast as overall payments in earlier development years.

We believe that one of the significant drivers of superimposed inflation is longer claim duration – which is modelled explicitly through the closure rate used in valuing the tail claims, but which is not explicitly modelled in the PPCI analysis used for earlier development years. The interaction of the closure rate, average size, and superimposed inflation is complex. At this valuation we have applied a different superimposed inflation rate to the tail projection from that of the earlier development years – reducing the rate in the tail from 5% pa to 3%.

We have projected the future tail payments based on an average closure rate of 20% per annum and an average payment per open claim of \$35,000 per annum to arrive at an average PPCI for the ‘tail’.

Selected PPCIs

The analysis we have done of payments in the tail suggests that it is appropriate to use separate PPCIs for different accident periods. For these purposes we have separated accident years into two groups:

- up to and including 1998/99
- 1999/00 and later.

This reflects our view that claims in the more recent accident years will experience higher average payments, associated with longer average duration. This pressure on claim duration is a feature of workers’ compensation schemes across Australia, particularly where claimants continue to experience difficulty in finding a job after many years out of the permanent workforce.

The selected tail PPCIs are as follows:

- \$1,700 – accident years up to an including 1998/99
- \$1,950 – accident years 1999/00 and later.

These assumptions are largely unchanged from our previous valuation, with the higher average annual payment per claimant being offset by the higher assumed rate of claim termination. It can be seen from this outcome that the cost of claims in the tail is sensitive to even small changes in the assumed termination rate.

5 Outstanding Claims Valuation

In this section we outline the results of our valuation of the Scheme's outstanding claims liabilities using the models and assumptions described in Section 3 and 4.

Please note that our estimates do not include liabilities now borne by the Nominal Insurer.

5.1 Insurers' Reserves

Each year the insurers are required to submit their estimates of outstanding claim liabilities to WorkSafe (via Form B). This information is then collated by WorkSafe for the Committee.

At this valuation we asked the insurers to provide separately the central estimates calculated by their actuaries. This information revealed that there is a variety of reporting practices amongst insurers, with not all insurers providing details of their provisions after margins to WorkSafe.

5.2 Summary of Valuation Results

A summary of the net valuation results subdivided by accident year is compared with Insurer Reserves at 30 June 2003, in Table 5.1.

Table 5.1 – Summary of Results at 30 June 2003

Accident Year	Net Outstanding Provision ¹	Insurer Reserves 2003	Difference between Trowbridge and Insurer Estimates	
	\$000	\$000	\$000	%
<i>94/95 and Prior</i>	18,323	17,007	1,316	7%
95/96	5,588	3,498	2,090	37%
96/97	7,534	4,777	2,757	37%
97/98	11,586	8,409	3,177	27%
98/99	15,483	8,101	7,382	48%
99/00	21,605	12,986	8,619	40%
00/01	26,475	18,747	7,728	29%
01/02	34,861	27,308	7,553	22%
02/03	48,591	41,219	7,372	15%
TOTAL	190,046	142,052	47,994	25%

¹ Including claims handling expenses of 6% of net claims and prudential margin of 15%

5.3 Comments on Results

Comparison with Insurer Reserves

Based on our analysis of the experience, we estimate a total net outstanding claims provision of \$190 million would have been appropriate for the Scheme as at 30 June 2003. This is \$48 million higher than the actual amounts reported as reserved by the insurers. The difference between our assessment of future payments under the Scheme, and those underlying the insurer reserves remains high. In fact, the total of insurer reserves of \$142 million are below our central estimate of the liabilities of \$156 million, before addition of any margins for claims handling expenses and prudential margin.

Prima facie, this is an unsatisfactory result, as potential under-reserving is detrimental to the ongoing viability of the Scheme and could result in underpricing, if not now then in the future. We suggest that the Committee further investigate this outcome by asking insurers to have their actuaries meet with us, either one-on-one or as a group, to review our conclusions against the observations we have made.

5.4 Scheme Profitability

In Figure 5.1 below we show:

1. The combined profit reported by each insurer on a financial year basis. This includes the performance reported by the HIH group up until 2001.
2. The profit for each year, recast to be on the basis of the claims incurred in each year (i.e. accident year basis), consistent with the actuarial valuation. The results shown for years 2000/01 and prior are taken from our previous valuation - and include HIH. Ideally we would have updated the analysis to include the results of the latest actuarial valuation, however this proved problematic because of insufficient HIH-specific premium data prior to the mid 1990's. This means that the impact of the changes to the valuation basis from this valuation have not flowed through into the accident year analysis for 2000/01 and earlier in this chart. However the changes to the basis are relatively small, and we are satisfied that the thrust of the results as shown in the chart, are appropriate.
3. The average premium rate charged by insurers. This includes the HIH group up until 2001.

Figure 5.1 – Scheme Profitability (Includes HIH)

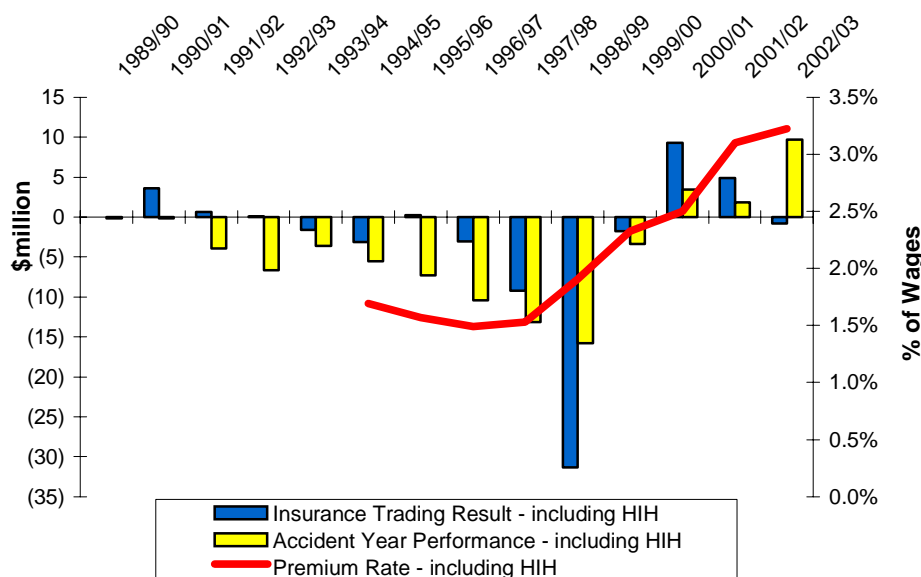


Figure 5.1 shows that on the basis of our assessment, business written from 1991/92 to 1999/00 was at unprofitable premium rates. The insurers typically reported losses during this period, with a very large loss reported in 1998/99 as the insurers strengthened reserves considerably for all prior years.

With substantial increases in premiums in recent years, the insurers are now reporting profits for this business. Insurers will need to be making reasonable levels of profits to establish margins in excess of central estimates and to service their capital if they are to continue to offer this insurance in the Territory.

5.5 Movement in Trowbridge Estimates

Based on our estimates, the movement in incurred claims cost for the scheme in the last financial year is as follows:

Table 5.2 – Incurred Claims Cost for the 2002/2003 Financial Year ¹

	\$000
Net Central Estimate at beginning of year (1)	158,454
Net Claims Payments (2)	40,154
Net Central Estimate at end of year (3)	<u>165,257</u>
Incurred Claims ((3)+(2)-(1))	<u>46,957</u>

¹ Including CHE

The major components of this movement are set out in Table 5.3.

Table 5.3 – Components of Incurred Claims Cost

	\$000
Cost of “run off” claims	
Change in ultimate numbers	(343)
Payments higher than expected	2,161
Interest expense due to 1 year's less inflation & discounting	5,876
Refinement to model mechanics	78
Change in average payment per claim (excluding tail)	(74)
Change in average payment per claim in the "tail" and runoff rate	(5,345)
Change in Discount Rate	5,978
Change in assumed Superimposed Inflation	(6,668)
Change in Expense assumptions	(4,642)
	<u>(2,978)</u>
Cost of New Claims	<u>49,935</u>
Total	<u>46,957</u>

After allowing for the cost of new claims, the most significant contributing items are:

- *claim payments* being higher than expected
- *interest expense*. This is a standard feature of the valuation process. It reflects the fact that the future claim costs have one year's less discounting applied in determining the value of outstanding claims, as they are one year closer to payment
- a reduction in the rate of superimposed inflation in the *tail* (to 3% pa from 5%) and an increase in the 'run-off' rate from 19% to 20%
- A reduction in the claims handling expense allowance (from 10% to 6%).

5.6 Movement in Insurer Estimates

Table 5.4 below shows the incurred claim cost based on the insurers returns. Note that the HIH Group data has been removed from this calculation.

Table 5.4 – Incurred Claim Cost in 2002/03 (Insurer data)

	\$000
Reserves at beginning of year (1)	118,593
Net Claims Payments (2)	40,155
Reserves at end of year (3)	<u>142,052</u>
Incurred Claims ((3)+(2)-(1))	<u>63,614</u>

A significant source of the increase in incurred claims cost is the addition of a new year's claims. Table 5.5 splits the incurred cost into two parts: the

movement due to the new year's claims, and the change in respect of prior years. This includes the unwinding of the discount for prior years' claims.

For comparison, Table 5.5 also shows the movement in the Trowbridge provision estimate, on an equivalent basis.

Table 5.5 – Comparison of Changes in Reserve Basis

	Trowbridge	Insurers
	\$000	\$000
Gross Incurred Cost in 2002/03	47,978	63,614
Cost of New Claims	56,273	48,901
Change in Prior Years	-8,296	14,713

As shown in Table 5.5, the movement in prior years is substantially lower for our valuation than the insurers, reflecting the changes made in our tail assumptions.

6 Premiums

Under Section 145(1) of the Work Health Act, one of the functions of the Committee is to “monitor premium rates offered for workers’ compensation in the Territory”.

In this section we have reviewed the premium rates in the NT, and provided a brief comparison with other Australian jurisdictions. Unless otherwise stated, all analysis of NT performance in this section has been conducted excluding information relating to the HIH Group.

6.1 Comparison to Earned Premiums

Table 6.1 summarises the performance of the Scheme over the last eight accident years, comparing the earned premiums to the expected cost of claims incurred each year.

For the purpose of comparison between premiums and claims costs we have adopted a discount rate of 5.0% pa in determining the cost of claims for each accident year. This is consistent with the discount rate used in the valuation of outstanding claims.

Table 6.1 – Earned Premium vs Accident Year Cost

Accident Year	Earned Premium	Total Net Claims Cost	Loss Ratio 2003	Loss Ratio 2002	Loss Ratio 2001¹
	\$000	\$000	%	%	%
97/98	28,311	33,280	118	120	128
98/99	31,987	38,153	119	123	131
99/00	44,148	38,076	86	88	92
00/01	52,432	38,809	74	76	79
01/02	60,149	42,175	70	69	
02/03	66,165	45,739	69		

The loss ratios in Table 6.1 account only for claims cost. They do not include administration expenses or commissions.

Although the most recent two accident years are still in the early stages of development, the increase in premiums during the last three years appears to have had a significant impact in reversing the earlier poor loss ratios.

6.2 Development of the Break-even Premium

To take the analysis one step further, we have made an allowance for expenses to estimate the “break-even premium” for insurers. This is the amount we estimate insurers need to charge to cover claims costs and expenses. The actual premium charged should be higher than this break-even level, to provide a profit to the insurers on the risk margins and capital that they need to hold in order to meet prudential as well as commercial requirements.

Based on analysis of insurers’ accounts and industry experience, we have built loadings into the break-even premium at the following levels:

- administration expenses - 15% of claim costs
- commission - 4% of net premiums.

Table 6.2 shows the results of the break-even premium calculation, including a forecast of the cost for 2003/04. The results in the table highlight the difference between the cost of the Scheme and the premium rates that have been charged by insurers over time.

Table 6.2- Comparison of Premiums Charged and Expected “Break-even Premiums”

Accident Year	Wages ¹ \$m	Gross Incurred Costs ² \$m	Expenses, Commission \$m	"Break-even Premium Rate"	Average Premium Rate Charged by Insurers
				%	%
97/98	1,437	34.1	6.6	2.8	1.6
98/99	1,586	39.1	7.6	2.9	1.9
99/00	1,859	39.2	7.5	2.5	2.4
00/01	1,924	40.0	7.7	2.5	2.9
01/02	2,130	43.6	8.3	2.4	3.1
02/03	2,170	47.5	9.1	2.6	3.2
03/04 ³ (forecast)	2,256	51.1	9.8	2.7	

1 Source: ANZSIC Data - excluding HIH/FAI/WMG

2 Including 4% inflation, 5% superimposed; discounted to middle of accident year at 5% pa.

3 Assumes 4% waggeroll growth, 0% claim number growth, 5% pa discount, 4% pa inflation, 5% pa superimposed

The assumptions used for the forecast for the 2003/04 year (based on recent experience) include:

- increase in total wage roll of 4% for 2003/04
- no increase in claim numbers over 2002/03 levels

- an increase in the average claim size to allow for one year's wage and superimposed inflation at the rates assumed in the valuation.

We have the following comments on the break-even premium analysis:

- If an insurer were to hold free capital in respect of its Northern Territory business equal to one year's premium as well as a 15% risk margin in its insurance liabilities, it would need to charge rates 25% more than our "breakeven premium" in order to return 12% per annum after tax to its shareholders. While different insurers will have different capital and return targets, such parameters seem a reasonable benchmark to us in a commercial insurance environment. Allowing for expenses and the cost of capital would suggest that business written since the 2000/01 financial year should be returning an adequate (but not excessive) profit for insurers (taken as a whole)
- The break-even premium is estimated to be quite stable in recent years, despite the existence of superimposed inflation in the Scheme. Whilst we have not investigated this in detail, one possible explanation is the steady reduction in the number of claims being reported. Quite apart from any improvements in occupational health and safety, in an environment of increasing premiums it may be that employers are opting to pay smaller claims directly, rather than passing them through the insurer (fearing the consequence on premiums in future years)
- We have projected a slight increase in the break-even premium for 2003/04 compared with earlier years. This reflects the impact of superimposed inflation, which has the claims costs growing faster than the wage roll.

6.3 Comparison with other Australian jurisdictions

Meaningful comparisons with other Australian jurisdictions are difficult because:

- benefits are not the same throughout Australia
- some jurisdictions have premiums established centrally, others are privately underwritten.

The Committee has compared average premiums with those charged in other jurisdictions in the past and we have updated the information on average premium rates where available.

For the Committee's information, we have again provided the table of comparison of average premium rates for previous years.

Table 6.3- Comparison of Average Premiums Rates Across Jurisdictions

Year	NT ¹	Comm	SA	Vic	NSW	WA	Qld	Tas	ACT
	%	%	%	%	%	%	%	%	%
94/95	1.7	1.6	2.9	2.3	1.8	2.7	1.7	2.9	2.3
95/96	1.6	5.2	2.9	2.0	2.5	2.6	1.9	3.0	2.4
96/97	1.5	5.0	2.9	1.8	2.8	2.7	2.0	3.2	2.5
97/98	1.5	3.0	2.9	1.8	2.8	2.4	2.1	3.1	2.1
98/99	1.9	2.6	2.9	1.9	2.8	2.7	2.1	2.7	2.1
99/00	2.3	2.8	2.9	1.9	2.8	3.1	1.9	2.9	2.6
00/01	2.9	3.1	2.9	2.2	2.8	3.0	1.8	3.1	2.5
01/02	3.1	3.4	2.5	2.2	2.8	2.6	1.6	3.1	n/a
02/03	3.2	3.1	2.5	2.2	2.8	2.5	1.6	n/a	n/a

¹ The NT rate has not been adjusted to remove the HIH Group

Note: The figures shown for the Commonwealth after 1995 are for the ACT Government service only.

Source: Workers' Compensation Arrangements in Australia and New Zealand, Heads of Workplace Safety and Compensation Authorities, October 2002

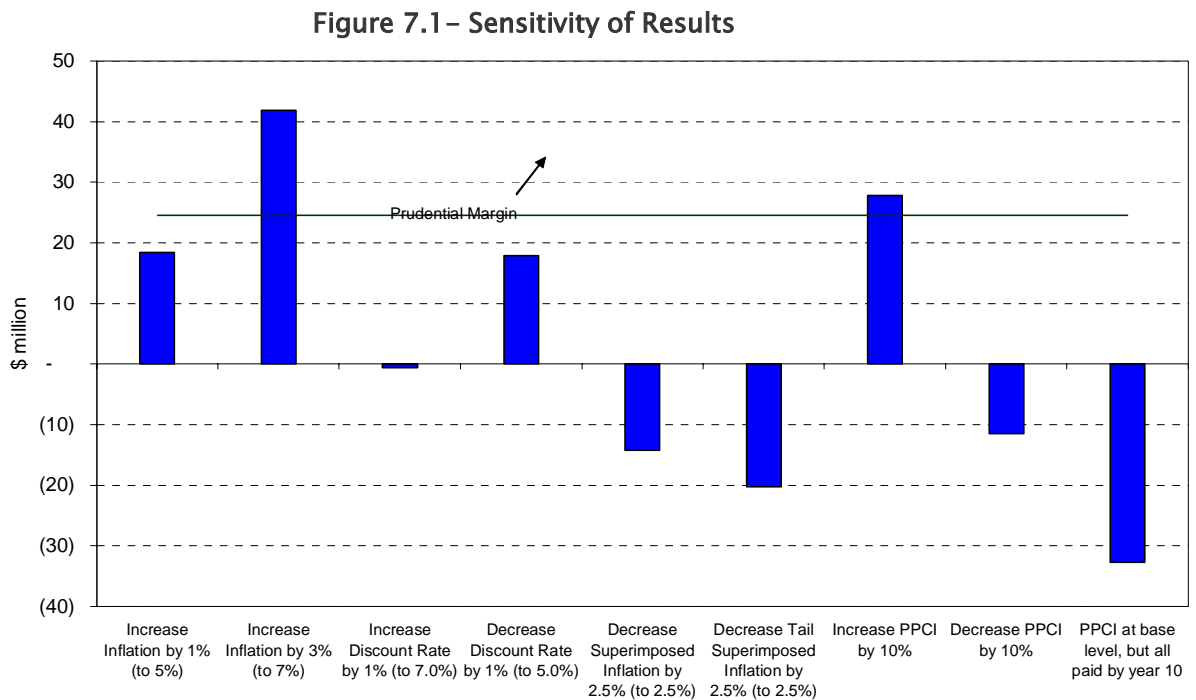
In terms of the rates shown above, please note the following:

- These premium rates have not been standardised to a common industry mix, and so reflect the different workforce compositions as well as the different benefit structures in each jurisdiction
- Comcare, South Australia and the Northern Territory are the only jurisdictions without common law. Victoria re-introduced common law rights (backdated) for accidents occurring after 12 November 1997 following the election of the Labor Government in 1999
- The ACT, Tasmania, Western Australia and the Northern Territory are privately underwritten; the other Schemes are monopoly schemes
- The rates quoted are the averages rates charged; they do not necessarily reflect the rates required to cover expected claims costs (ie. they will have varying levels of profitability).

7 Sensitivity of Results

The valuation results are sensitive to the assumptions used, and as previously noted, the selection of appropriate assumptions is subject to uncertainty.

The effect on the total outstanding claims liability (industry expenses and prudential margin) of changing some of the valuation assumptions is shown in Figure 7.1 below. The “buffer” provided by the 15% prudential margin is also shown.



We have the following comments on the analysis shown in Figure 7.1:

- A change of 1% in either the inflation or discount rate produces a movement in the valuation of around \$10 million. Note that if both assumptions were to increase or decrease by the same amount then the impact on the valuation is negligible. As noted previously it is the gap between the two rates that drives the valuation result. A movement of 1% in these rates is substantial in terms of market conditions. We have also shown the impact of a 3% increase in inflation rates for illustrative purposes, but do not consider it a likely outcome in isolation (a movement of this magnitude would be expected to be largely offset by an increase in the discount rate)

- The sensitivity of the valuation result to our selected PPCI assumptions is also shown. A 10% change, in absolute terms, will result in a movement in our valuation result of close to \$10 million
- The effect of a change to the assumed level of superimposed inflation has also been tested. Halving the rate of superimposed inflation firstly overall, and then only in the tail, can produce material movements in the valuation result. We propose undertaking further analysis of the presence of superimposed inflation in the tail at the next valuation.

8 Reliances and Limitations

We have relied on data provided by WorkSafe which included copies of the insurers' Forms A and B. Appendix A outlines the data we received and notes the considerable level of unreliability around various aspects of it.

While we have conducted reasonableness checks regarding the accuracy of the information we have not independently verified it. If for any reason, there is any material error or omission in the information provided, then this may materially impact our estimates.

The nature of workers' compensation liabilities means that there is inherent uncertainty in any estimates of outstanding claim liabilities. Deviations from our estimates are normal and are to be expected.

The purpose of the report is outlined in Section 1 above. It is not intended for any other purpose. In particular, sections of the report that analyse premium adequacy, are intended as a monitoring tool only. Use of this information for any other purpose (eg. premium pricing) is not appropriate.

The report should be considered as a whole. Consultants from Trowbridge Deloitte are available to answer any queries, and the reader should seek such advice before drawing conclusions on any issue in doubt.

This report is intended for the use of the Scheme Monitoring Committee. While it may be included on the NT Government website as an aid to understanding the development of the Scheme, Trowbridge Deloitte accepts no responsibility for any action by third parties which may be taken based on any aspect of this report.

Part III Appendices

A Information Provided

A.1 Sources of Claims and Other Data

At this investigation, we were supplied with the following information:

- Forms A and B for each insurer and for combined industry for financial year 2002/2003. (This included profit and loss statements and claims information). Prior year's information was provided at the previous investigations.
- ANZSIC Data from individual insurers and combined for 2002/2003 financial year, showing
 - policies written
 - employee numbers covered
 - wages paid
 - premiums receivedby major ANZSIC code (prior years information was provided at previous investigations).
- Payment information from the Office of Work Health and Electrical Safety system by accident year for the financial year 2002/2003 (we have previously been supplied with this information for prior financial years)
- For all claims that have been on benefit for longer than seven years post accident, individual claim data which included dates of accident, report and finalisation (if applicable) and total benefits paid.

A.2 Data Reconciliation and Adequacy

We reviewed the data provided for general reasonableness and attempted to reconcile the insurers' data (from forms A and B) with that provided directly from the system.

Unfortunately the data from these two sources did not reconcile very well (the discrepancy was approximately 5%). As has been discussed on a number of previous occasions, we consider this level of reconciliation unsatisfactory. Table A.1 below summarises the differences in relation to the 2002/03 financial year.

Table A.1 – Form B and Heads of Damage payment comparison

Accident Year	Paid in 2002/03 Financial Year		
	From Form B	From NT Worksafe	% Difference
	\$000	\$000	
94/95 and prior	4,123	5,196	-26%
95/96	1,268	1,098	13%
96/97	1,213	1,534	-26%
97/98	2,523	2,173	14%
98/99	4,412	4,258	3%
99/00	4,003	4,391	-10%
00/01	5,747	5,854	-2%
01/02	9,612	10,244	-7%
02/03	7,682	7,864	-2%
TOTAL	40,583	42,612	-5%

The ANZSIC data provided as at 30 June 2003 was complete, although the employee details for all insurers AGAIN appeared to be incorrect. It is our understanding that a number of employers do not keep accurate records of employee numbers for ANZSIC purposes – some might return the number of employees used during the year, or not take into account part-time work. This ultimately overstates the employee numbers, limiting the use of this data. The other information – wages, policies written and premiums is believed to be correct and was useful for the purposes of our analysis.

Table A.2 summarises the differences between 2002 and 2003.

Table A.2 – Comparison 2002 and 2003 ANZSIC Data

	2002	2003	% change
A. Agriculture, Forestry & Fishing	5,041	5,004	-1%
B. Mining	7,007	9,736	39%
C. Manufacturing	3,181	3,773	19%
D. Electricity, Gas & Water Supply	2,487	787	-68%
E. Construction	6,983	12,689	82%
F. Wholesale Trade	3,080	3,282	7%
G. Retail Trade	11,259	12,002	7%
H. Accommodation, Cafes & Restaurants	12,286	15,972	30%
I. Transport & Storage	5,785	6,703	16%
J. Communication Services	515	710	38%
K. Finance & Insurance	1,054	1,208	15%
L. Property & Business Services	9,145	9,605	5%
M. Government Administration & Defence	14,275	13,559	-5%
N. Education	5,454	5,735	5%
O. Health & Community Services	4,614	5,575	21%
P. Cultural & Recreational Services	5,367	5,258	-2%
Q. Personal & Other Services	2,351	6,623	182%
Total	99,884	118,221	18%

The data limitations described above introduce further uncertainty in the results of our analysis of the Scheme liabilities.

B Claim Numbers

The chain ladder method estimates the ultimate number of reported claims in each accident year by analysing past claim reporting patterns and estimating a pattern for the future.

The steps are as follows:

1. Produce a triangle of cumulative claim reports, subdivided by accident year and development year.
2. Calculate development ratios (or chain ladder factors) by dividing the cumulative reports to the end of development year x by the cumulative reports to the end of development year $x-1$.
3. Select a development ratio for each development year, based on a combination of the historical experience, application of judgement, and expectations for the future.
4. Apply these ratios to cumulative reports to date to project the ultimate number of claims in each underwriting year.

B.1 Chain Ladder (Excluding HIH Group)

This table shows the chain ladder analysis for the number of claims reported.

Appendix B.1 - Chain Ladder (Excluding HIH Group)

Cumulative Number of Claims

Accident Year	1	2	3	4	5	6	7	8	9+
1988/89	2,208	2,425	2,447	2,449	2,451	2,451	2,453	2,454	2,455
1989/90	2,265	2,616	2,628	2,632	2,633	2,635	2,635	2,635	2,646
1990/91	2,242	2,483	2,497	2,499	2,502	2,504	2,506	2,506	2,516
1991/92	1,890	2,136	2,146	2,148	2,148	2,149	2,149	2,149	2,158
1992/93	1,923	2,114	2,120	2,123	2,128	2,131	2,131	2,133	2,138
1993/94	1,853	1,997	2,004	2,012	2,015	2,016	2,017	2,018	2,021
1994/95	1,792	2,027	2,035	2,038	2,040	2,043	2,045	2,045	2,048
1995/96	2,150	2,434	2,442	2,446	2,446	2,447	2,449	2,451	
1996/97	2,190	2,475	2,486	2,488	2,490	2,490	2,494		
1997/98	2,406	2,799	2,819	2,827	2,827	2,829			
1998/99	2,527	2,897	2,910	2,916	2,920				
1999/00	2,655	2,943	2,960	2,961					
2000/01	2,566	2,847	2,859						
2001/02	2,581	2,879							
2002/03	2,599								

Chain Ladder Factors

Accident Year	1:2	2:3	3:4	4:5	5:6	6:7	7:8	8:9
1988/89	1.0983	1.0091	1.0008	1.0008	1.0000	1.0008	1.0004	1.0004
1989/90	1.1550	1.0046	1.0015	1.0004	1.0008	1.0000	1.0000	1.0042
1990/91	1.1075	1.0056	1.0008	1.0012	1.0008	1.0008	1.0000	1.0040
1991/92	1.1302	1.0047	1.0009	1.0000	1.0005	1.0000	1.0000	1.0042
1992/93	1.0993	1.0028	1.0014	1.0024	1.0014	1.0000	1.0009	1.0023
1993/94	1.0777	1.0035	1.0040	1.0015	1.0005	1.0005	1.0005	1.0015
1994/95	1.1311	1.0039	1.0015	1.0010	1.0015	1.0010	1.0000	1.0015
1995/96	1.1321	1.0033	1.0016	1.0000	1.0004	1.0008	1.0008	
1996/97	1.1301	1.0044	1.0008	1.0008	1.0000	1.0016		
1997/98	1.1633	1.0071	1.0028	1.0000	1.0007			
1998/99	1.1464	1.0045	1.0021	1.0014				
1999/00	1.1085	1.0058	1.0003					
2000/01	1.1095	1.0042						

Summary statistics

	1:2	2:3	3:4	4:5	5:6	6:7	7:8	tail
Maximum	1.1633	1.0091	1.0040	1.0024	1.0015	1.0016	1.0009	1.0042
Minimum	1.0777	1.0028	1.0003	1.0000	1.0000	1.0000	1.0000	1.0004
Simple average	1.1218	1.0049	1.0016	1.0009	1.0007	1.0006	1.0003	1.0026
Column sum average	1.1224	1.0050	1.0015	1.0008	1.0006	1.0006	1.0003	1.0026
Standard deviation	0.0238	0.0017	0.0010	0.0007	0.0005	0.0005	0.0004	0.0015

Selected development factors

	1:2	2:3	3:4	4:5	5:6	6:7	7:8	tail
Selected ratios	1.1200	1.0050	1.0025	1.0010	1.0008	1.0006	1.0004	1.0035
<i>Selected for 6/02 valn</i>	1.1250	1.0055	1.0025	1.0010	1.0008	1.0005	1.0004	1.0035
Cumulative development factor	1.1355	1.0139	1.0088	1.0063	1.0053	1.0045	1.0039	1.0035
Percentage developed	0.8806	0.9863	0.9912	0.9937	0.9947	0.9955	0.9961	0.9965
Future % development factors	0.1194	0.0137	0.0088	0.0063	0.0053	0.0045	0.0039	0.0035

Accident Year	1	2	3	4	5	6	7	8	9+	Ultimate
1988/89	2,208	217	22	2	2	0	2	1	1	2,455
1989/90	2,265	351	12	4	1	2	0	0	11	2,646
1990/91	2,242	241	14	2	3	2	2	0	10	2,516
1991/92	1,890	246	10	2	0	1	0	0	9	2,158
1992/93	1,923	191	6	3	5	3	0	2	5	2,138
1993/94	1,853	144	7	8	3	1	1	1	3	2,021
1994/95	1,792	235	8	3	2	3	2	0	3	2,048
1995/96	2,150	284	8	4	0	1	2	2	9	2,460
1996/97	2,190	285	11	2	2	0	4	1	9	2,504
1997/98	2,406	393	20	8	0	2	2	1	10	2,842
1998/99	2,527	370	13	6	4	2	2	1	10	2,935
1999/00	2,655	288	17	1	3	2	2	1	10	2,980
2000/01	2,566	281	12	7	3	2	2	1	10	2,884
2001/02	2,581	298	14	7	3	2	2	1	10	2,919
2002/03	2,599	312	15	7	3	2	2	1	10	2,951

C Claim Payments

C.1 Payment Information (Excluding HIH Group)

Appendix C.1 Payment Information (Excluding HIH Group)

Incremental claims payments (\$000)

Accident Year	1	2	3	4	5	6	7	8	9+	AccYr Total	Pt Yr Total
1980/81									384	384	
1981/82								102	641	742	
1982/83							481	78	1,061	1,620	
1983/84						1,111	681	631	1,060	3,483	
1984/85					905	379	871	507	1,135	3,797	
1985/86				899	779	790	901	251	874	4,493	
1986/87			984	891	1,098	903	719	1,240	1,364	7,199	
1987/88		2,387	1,143	1,064	973	947	940	480	916	8,849	
1988/89	2,770	2,543	1,196	1,085	1,286	814	584	865	1,241	12,384	10,024
1989/90	3,609	3,631	2,058	2,285	1,789	1,350	1,165	1,281	3,402	20,570	10,742
1990/91	3,288	2,935	1,510	1,280	883	935	709	1,365	4,441	17,345	13,630
1991/92	3,034	3,044	1,198	694	791	719	1,001	783	5,566	16,831	13,455
1992/93	3,836	3,592	1,540	1,185	1,562	1,566	1,271	530	4,704	19,786	15,012
1993/94	2,957	2,621	1,599	1,628	1,414	1,100	1,386	961	6,932	20,597	14,684
1994/95	3,304	3,439	1,890	2,391	1,775	1,220	2,021	1,056	4,123	21,219	12,820
1995/96	3,807	4,402	3,414	2,159	2,171	1,583	1,598	1,268		20,402	14,701
1996/97	4,781	5,690	3,358	3,343	3,605	2,128	1,213			24,118	18,213
1997/98	4,955	6,388	3,430	3,562	2,692	2,523				23,550	25,198
1998/99	6,103	7,228	4,951	3,406	4,412					26,100	27,378
1999/00	6,419	8,208	5,164	4,003						23,794	31,293
2000/01	7,299	8,212	5,747							21,258	36,894
2001/02	7,493	9,612								17,105	38,681
2002/03	7,682									7,682	40,583

Inflation-adjusted claim payments (\$000)

Accident Year	1	2	3	4	4	4	4	4	4	4	AccYr Total	Pt Yr Total
1980/81	0	0	0	0	0	0	0	0	0	577	577	
1981/82	0	0	0	0	0	0	0	0	153	898	1,051	
1982/83	0	0	0	0	0	0	722	109	1,430	2,262	2,262	
1983/84	0	0	0	0	0	1,667	954	851	1,397	4,870	4,870	
1984/85	0	0	0	0	1,359	531	1,175	668	1,488	5,220	5,220	
1985/86	0	0	0	1,350	1,092	1,064	1,187	329	1,128	6,150	6,150	
1986/87	0	0	1,476	1,249	1,481	1,191	942	1,601	1,749	9,689	9,689	
1987/88	0	3,583	1,602	1,434	1,282	1,242	1,214	615	1,162	12,133	12,133	
1988/89	4,157	3,565	1,612	1,430	1,686	1,051	749	1,097	1,531	16,878	15,044	
1989/90	5,059	4,895	2,712	2,996	2,311	1,731	1,477	1,580	3,947	26,708	15,058	
1990/91	4,432	3,869	1,980	1,653	1,132	1,186	875	1,584	5,406	22,115	18,376	
1991/92	4,000	3,991	1,547	890	1,003	886	1,161	953	6,050	20,483	17,737	
1992/93	5,030	4,639	1,974	1,503	1,926	1,817	1,547	576	5,025	24,037	19,683	
1993/94	3,818	3,361	2,028	2,007	1,640	1,339	1,506	1,026	7,484	24,210	18,961	
1994/95	4,236	4,362	2,331	2,774	2,161	1,326	2,159	1,140	4,123	24,612	16,437	
1995/96	4,830	5,429	3,961	2,628	2,360	1,691	1,725	1,268		23,891	18,647	
1996/97	5,897	6,601	4,088	3,634	3,851	2,297	1,213			27,580	22,462	
1997/98	5,748	7,776	3,728	3,805	2,906	2,523				26,487	29,232	
1998/99	7,430	7,856	5,289	3,677	4,412					28,664	33,328	
1999/00	6,977	8,768	5,575	4,003						25,323	34,013	
2000/01	7,797	8,866	5,747							22,410	39,410	
2001/02	8,090	9,612								17,702	41,761	
2002/03	7,682									7,682	40,583	

D PPCI Development Years 1–8

The PPCI method models the claims process by assuming that the payments arising from a cohort of claims develop in a predictable pattern over a period of years. The PPCI method requires assumptions about:

- Claim numbers by accident year
- Average claim size
- Payment patterns (i.e. the proportion of the overall claim payment made in each development period).

Future payments for each accident year are projected by multiplying together:

- The number of claims incurred
- The assumed payments per claim incurred in each future development period
- An inflation index based on the projected rates of claims inflation.

The present value of liabilities is calculated by discounting the projected payments to the valuation date at the assumed discount rate.

D.1 Payments Per Claim Incurred (Excluding HIH Group)

This table shows the PPCI analysis for the first 8 development years.

Appendix D.1 Payments Per Claim Incurred (Excluding HIH Group)

Inflation-adjusted payments per claim incurred (\$)

Accident Year	1	2	3	4	5	6	7	8	9+	Pt Yr Total
1984/85					543	212	470	267	595	
1985/86				540	437	426	475	132	451	
1986/87			590	499	592	476	377	640	700	
1987/88		1,433	641	574	513	497	486	246	465	
1988/89	1,693	1,452	657	582	687	428	305	447	623	4,800
1989/90	1,912	1,850	1,025	1,132	873	654	558	597	1,492	5,153
1990/91	1,762	1,538	787	657	450	471	348	629	2,149	6,330
1991/92	1,854	1,849	717	412	465	411	538	442	2,803	6,730
1992/93	2,353	2,170	923	703	901	850	724	269	2,350	8,408
1993/94	1,889	1,663	1,003	993	812	663	745	508	3,703	8,311
1994/95	2,068	2,130	1,138	1,354	1,055	647	1,054	557	2,013	7,422
1995/96	1,964	2,207	1,610	1,069	959	687	701	516		8,206
1996/97	2,355	2,636	1,633	1,451	1,538	918	484			9,574
1997/98	2,023	2,737	1,312	1,339	1,023	888				11,944
1998/99	2,531	2,676	1,802	1,253	1,503					13,000
1999/00	2,341	2,943	1,871	1,343						13,206
2000/01	2,703	3,074	1,993							14,924
2001/02	2,771	3,293								15,871
2002/03	2,603									14,636

Summary statistics

	1	2	3	4	5	6	7	8	9
Maximum	2,771	3,293	1,993	1,451	1,538	918	1,054	640	3,703
Minimum	1,693	1,433	590	412	437	212	305	132	451
Simple average	2,188	2,243	1,180	927	823	588	559	437	1,577
Column sum average	2,215	2,294	1,215	942	833	588	547	437	1,505
Standard deviation	356	616	488	372	354	206	203	170	1,109

Selected payments per claim incurred

Selected PPCI	1	2	3	4	5	6	7	8	Tail	Total
- DY: 9+ tail for acc yrs pre 30/6/1999									1,700	
- DY: 1-8; 9+ tail for acc yrs post 30/6/1999	2,750	3,200	1,900	1,300	1,090	820	750	500	1,950	14,260
Selected 6/02 valn rolled fwd @ 9%	2,780	3,161	1,908	1,308	1,090	818	763	491	1,799	14,116
Selected 6/02 valn	2,550	2,900	1,750	1,200	1,000	750	700	450	1,650	12,950

E PPCI For the Tail

E.1 Finalisation Rates for Development Years 1–8 (Excluding HIH Group)

Finalisation rates are calculated by comparing the cumulative number of claims finalised in successive development years, and using the selected finalisation rates to project for future development periods

E.2 Claim Numbers Open at Year End (Excluding HIH Group)

The number of open claims at the end of each year is equal to the number open at the start of the year less the number closed during the year. This data is extracted from the insurer returns.

E.3 Claim Numbers Open at Year End Modelled (Excluding HIH Group)

The modelling of open claims starts with the analysis of open claims at year end, and models the number of open claims in the tail development years. The modelling of the number of claims finalised in each year is based on the number open at the start multiplied by the assumed closure rate.

E.4 Average Payment per Open Claim (Excluding HIH Group)

The average payment per open claim is selected based on the history of average payments in the tail (development years 9 and later). Explicit adjustment has been made for the impact of commutations. Analysis both with and without HIH has been used (as we were unable to examine commutation history excluding HIH in the past).

E.5 Claim Payments for Modelled Open Claims – Current Value

The claim payments for modelled open claims is equal to the modelled open claims for each year multiplied by our selected assumption of \$33,280 per open claim.

The implied tail PPCI is calculated based on the projected payments divided by the ultimate number of claims reported for that accident year.

Appendix E.1 - Finalisation Rates for Development Years 1-8 (Excluding HIH Group)

Cumulative Number of Claims Finalised

Accident Year	1	2	3	4	5	6	7	8
1988/89	1,448	2,285	2,359	2,381	2,405	2,405	2,416	2,424
1989/90	1,546	2,428	2,516	2,546	2,559	2,572	2,584	2,583
1990/91	1,460	2,331	2,416	2,436	2,452	2,460	2,464	2,468
1991/92	1,190	2,017	2,056	2,093	2,107	2,117	2,124	2,128
1992/93	1,253	1,917	2,044	2,056	2,071	2,086	2,094	2,102
1993/94	1,167	1,856	1,917	1,954	1,968	1,971	1,981	1,993
1994/95	1,109	1,822	1,937	1,967	1,981	1,997	2,014	2,023
1995/96	1,331	2,233	2,336	2,378	2,399	2,412	2,423	2,429
1996/97	1,432	2,308	2,368	2,411	2,441	2,458	2,463	
1997/98	1,580	2,589	2,704	2,748	2,783	2,794		
1998/99	1,782	2,679	2,807	2,848	2,865			
1999/00	1,563	2,721	2,831	2,881				
2000/01	1,770	2,618	2,740					
2001/02	1,638	2,614						
2002/03	1,668							

Summary statistics

	1	2	3	4	5	6	7	8
Maximum	61.37%	93.47%	96.09%	97.02%	97.96%	98.32%	98.51%	98.78%
Minimum	52.46%	88.96%	94.58%	96.04%	96.71%	97.20%	97.66%	97.62%
Simple average	57.01%	91.31%	95.22%	96.61%	97.39%	97.82%	98.18%	98.44%
Column sum average	57.04%	91.30%	95.23%	96.62%	97.41%	97.83%	98.17%	98.42%
Standard deviation	2.49%	1.32%	0.49%	0.34%	0.44%	0.36%	0.30%	0.41%

Selected Finalisation Rates

	1	2	3	4	5	6	7	8
Selection	57.00%	91.00%	95.00%	96.75%	97.75%	98.00%	98.25%	98.50%
Selected 6/02 valn	57.00%	91.00%	95.00%	96.75%	97.75%	98.00%	98.25%	98.50%
Revised Selection	57.00%	91.00%	95.00%	96.75%	97.75%	98.00%	98.25%	98.50%
Incremental Selection	34.00%	4.00%	1.75%	1.00%	0.25%	0.25%	0.25%	0.30%

Incremental Number of Finalised Claims

Accident Year	1	2	3	4	5	6	7	8
1988/89	1,448	837	74	22	24	0	11	8
1989/90	1,546	882	88	30	13	13	12	-1
1990/91	1,460	871	85	20	16	8	4	4
1991/92	1,190	827	39	37	14	10	7	4
1992/93	1,253	664	127	12	15	15	8	8
1993/94	1,167	689	61	37	14	3	10	12
1994/95	1,109	713	115	30	14	16	17	9
1995/96	1,331	902	103	42	21	13	11	6
1996/97	1,432	876	60	43	30	17	5	6
1997/98	1,580	1,009	115	44	35	11	6	6
1998/99	1,782	897	128	41	17	8	8	8
1999/00	1,563	1,158	110	50	30	8	8	8
2000/01	1,770	848	122	50	29	7	7	7
2001/02	1,638	976	136	59	34	8	8	8
2002/03	1,668	1,015	119	52	30	7	7	7

Appendix E.2 - Claim Numbers Open at Year End (Excluding HIH Group)

Accident Year	1	2	3	4	5	6	7	8	9+	Totals new in 9+	closure rate
1980/81	-	-	-	-	-	-	-	-	31		2
1981/82	-	-	-	-	-	-	-	11	42		4 5%
1982/83	-	-	-	-	-	-	17	7	39		8 26%
1983/84	-	-	-	-	-	35	24	19	48		3 19%
1984/85	-	-	-	-	44	34	25	18	60		7 14%
1985/86	-	-	-	59	40	27	23	17	48		2 38%
1986/87	-	-	97	69	52	40	34	26	62		3 18%
1987/88	-	144	80	59	49	43	38	25	72		3 19%
1988/89	760	140	88	68	46	46	37	30	91		1 11%
1989/90	719	188	112	86	74	63	51	52	118	1,155	11 21%
1990/91	782	152	81	63	50	44	42	38	121	1,279	10 25%
1991/92	700	119	90	55	41	32	25	21	122	1,210	9 17%
1992/93	670	197	76	67	57	45	37	31	130	1,156	5 16%
1993/94	686	141	87	58	47	45	36	25	127	1,268	3 19%
1994/95	683	205	98	71	59	46	31	22	121	1,192	3 20%
1995/96	819	201	106	68	47	35	26	22	-	1,416	
1996/97	758	167	118	77	49	32	31	-	-	1,389	
1997/98	826	210	115	79	44	35	-	-	-	1,443	
1998/99	745	218	103	68	55	-	-	-	-	1,424	
1999/00	1,092	222	129	80	-	-	-	-	-	1,784	
2000/01	796	229	119	-	-	-	-	-	-	1,470	
2001/02	943	265	-	-	-	-	-	-	-	1,620	
2002/03	931	-	-	-	-	-	-	-	-	1,659	
Total	11,910	2,798	1,499	1,027	754	602	477	364	1,232		

Appendix E.3 - Claim Numbers Open at Year End Modelled (Excluding HIH Group)

Assumed 17% reduction rate for all past DYs; and 20% for future DYs

Accident Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1980/81	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0
1981/82	-	-	-	-	-	-	-	11	9	8	6	5	4	4	3	2	2	2
1982/83	-	-	-	-	-	-	17	7	6	5	4	3	3	2	2	2	1	1
1983/84	-	-	-	-	-	35	24	19	16	13	11	9	7	6	5	4	4	3
1984/85	-	-	-	-	44	34	25	18	15	12	10	9	7	6	5	4	3	3
1985/86	-	-	-	59	40	27	23	17	14	12	10	8	7	6	5	4	3	3
1986/87	-	-	97	69	52	40	34	26	22	18	15	12	10	9	7	6	5	4
1987/88	-	144	80	59	49	43	38	25	21	17	14	12	10	8	9	7	6	5
1988/89	760	140	88	68	46	46	37	30	25	21	17	14	12	13	11	9	7	6
1989/90	719	188	112	86	74	63	51	52	43	36	30	25	23	19	15	12	10	8
1990/91	782	152	81	63	50	44	42	38	32	26	22	29	16	13	10	8	7	5
1991/92	700	119	90	55	41	32	25	21	17	14	8	7	6	4	4	3	2	2
1992/93	670	197	76	67	57	45	37	31	26	19	17	14	11	9	7	6	4	4
1993/94	686	141	87	58	47	45	36	25	20	15	12	10	8	6	5	4	3	3
1994/95	683	205	98	71	59	46	31	22	19	15	12	10	8	6	5	4	3	3
1995/96	819	201	106	68	47	35	26	22	18	14	11	9	7	6	5	4	3	2
1996/97	758	167	118	77	49	32	31	26	21	17	13	11	9	7	5	4	4	3
1997/98	826	210	115	79	44	35	31	26	21	17	13	11	8	7	5	4	3	3
1998/99	745	218	103	68	55	50	43	37	29	24	19	15	12	10	8	6	5	4
1999/00	1,092	222	129	80	53	47	42	35	28	23	18	14	12	9	7	6	5	4
2000/01	796	229	119	76	50	45	39	33	27	21	17	14	11	9	7	6	4	4
2001/02	943	265	144	92	61	55	48	41	33	26	21	17	13	11	9	7	5	4
2002/03	931	228	123	78	52	46	41	34	28	22	18	14	11	9	7	6	5	4

Appendix E.4 - Claim payments for modelled open claims - Current Value

Accident Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1980/81										0	0	0	0	0	0	0	0	0
1981/82									352	292	243	201	167	139	115	96	79	66
1982/83								78	224	186	154	128	106	88	73	61	50	42
1983/84							681	631	608	505	419	348	289	240	199	165	137	114
1984/85						379	871	507	576	478	397	330	274	227	188	156	130	108
1985/86					779	790	901	251	544	452	375	311	258	214	178	148	123	102
1986/87			891	1,098	903	719	1,240	833	691	574	476	395	328	272	226	188	153	
1987/88			1,064	973	947	940	480	801	665	552	458	380	315	301	288	235	188	
1988/89			1,085	1,286	814	584	865	961	797	662	549	456	434	420	347	277	222	
1989/90			2,285	1,789	1,350	1,165	1,281	1,665	1,382	1,147	952	834	735	599	479	383	306	
1990/91			1,280	883	935	709	1,365	1,217	1,010	838	888	788	504	403	323	258	206	
1991/92			694	791	719	1,001	783	673	558	393	263	221	176	141	113	90	72	
1992/93			1,185	1,562	1,566	1,271	530	993	783	630	536	428	343	274	219	175	140	
1993/94			1,628	1,414	1,100	1,386	961	788	613	473	378	302	242	194	155	124	99	
1994/95			2,391	1,775	1,220	2,021	1,056	718	599	479	383	306	245	196	157	126	100	
1995/96			2,159	2,171	1,583	1,598	840	693	554	444	355	284	227	182	145	116	93	
1996/97			3,343	3,605	2,128	1,103	1,001	825	660	528	422	338	270	216	173	138	111	
1997/98			3,562	2,692	1,383	1,150	991	816	653	522	418	334	267	214	171	137	109	
1998/99			3,406	2,153	1,829	1,626	1,403	1,158	926	741	593	474	379	304	243	194	155	
1999/00			2,993	2,320	1,749	1,556	1,343	1,107	886	709	567	454	363	290	232	186	149	
2000/01			3,658	2,194	1,653	1,471	1,269	1,046	837	670	536	429	343	274	219	176	140	
2001/02			3,689	2,671	2,021	1,796	1,550	1,280	1,024	819	655	524	420	336	268	215	172	
2002/03			3,533	2,276	1,715	1,526	1,316	1,086	869	695	556	445	356	285	228	182	146	
Adopted Pattern - accident years pre 30/6/1999									343	274	219	175	140	112	90	72	57	46
Adopted Pattern - accident years post 30/6/1999									393	314	251	201	161	129	103	82	66	53

F Valuation Results, including Scheme Cost

F.1 Valuation Results by Accident Year

F.2 Projected Cashflows

F.3 Estimated Annual Scheme Cost

Appendix F.1 - Valuation Results by Accident Year

Accident Year	Gross Central Estimate ¹	Reinsurance Recoveries ²	Net Central Estimate	Margins and Expenses ³	Net Outstanding Provision	Insurer Reserves 2002
	\$000	\$000	\$000	\$000	\$000	\$000
<i>94/95 and Prior</i>	14,966	299	14,666	3,212	17,878	17,007
95/96	4,678	94	4,584	1,004	5,588	3,498
96/97	6,307	126	6,181	1,354	7,534	4,777
97/98	9,698	194	9,504	2,081	11,586	8,409
98/99	12,960	259	12,701	2,782	15,483	8,101
99/00	18,086	362	17,724	3,882	21,605	12,986
00/01	22,162	443	21,718	4,756	26,475	18,747
01/02	29,182	584	28,598	6,263	34,861	27,308
02/03	40,675	814	39,862	8,730	48,591	41,219
TOTAL	158,713	3,174	155,539	34,063	189,602	142,052

1 Assumed Future Wage Inflation at 4%pa, Superimposed inflation at 5%pa, Discounted at 5%pa

2 Reinsurance Recoveries assumed to be 2% of Gross Claim Payments

3 Claims Handling Expenses 6% of Net Central Estimate, Prudential Margin 15% of Net Central Estimate plus Claims Handling Expenses

Appendix F.2 - Projected cashflows (Undiscounted & Inflated) (\$000)

Accident Year	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	thereafter	Total
1985/86	98	84	72	62	53	45	39	33	28	24	21	18	0	0	577
1986/87	123	105	90	77	66	57	48	41	35	30	26	22	19	0	741
1987/88	154	132	113	96	83	71	60	52	44	38	32	28	24	20	946
1988/89	189	162	138	118	101	87	74	64	54	47	40	34	29	46	1,183
1989/90	254	218	186	159	136	117	100	86	73	63	54	46	39	87	1,619
1990/91	302	259	221	190	162	139	119	102	87	75	64	55	47	129	1,949
1991/92	324	277	237	203	174	149	127	109	93	80	68	59	50	161	2,113
1992/93	401	343	294	252	215	184	158	135	116	99	85	73	62	224	2,641
1993/94	474	406	347	297	255	218	186	160	137	117	100	86	73	289	3,145
1994/95	600	514	440	377	322	276	236	202	173	148	127	109	93	393	4,011
1995/96	901	772	661	565	484	414	355	304	260	222	190	163	140	625	6,055
1996/97	1,365	1,000	856	733	627	537	460	393	337	288	247	211	181	848	8,083
1997/98	2,323	1,688	1,237	1,059	907	776	664	569	487	417	357	305	261	1,273	12,324
1998/99	2,624	2,616	1,901	1,393	1,193	1,021	874	748	640	548	469	402	344	1,727	16,500
1999/00	3,540	2,903	2,894	2,103	1,768	1,514	1,296	1,109	949	813	696	595	510	2,629	23,318
2000/01	4,087	3,735	3,063	3,054	2,219	1,866	1,597	1,367	1,170	1,002	857	734	628	3,311	28,690
2001/02	6,045	4,508	4,120	3,379	3,368	2,448	2,058	1,762	1,508	1,291	1,105	946	810	4,346	37,693
2002/03	10,294	6,662	4,969	4,541	3,724	3,712	2,698	2,268	1,941	1,662	1,423	1,218	1,042	5,681	51,834

Note:

- Payments are gross of reinsurance recoveries
- Payments do not include allowance for claim handling expenses

Appendix F.3 - Estimated Annual Scheme Cost

Accident Year	Earned Premium	Net Paid to Date		Net Outstanding		Total Net Claims Cost	Assumed Expenses ²	Total Cost	Loss Ratio
		Undisc	Disc ¹	at 6/02	Disc ¹				
	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	%
1997/98	28,311	29,133	26,382	9,205	6,898	33,280	6,587	39,867	141
1998/99	31,987	30,934	28,412	12,380	9,741	38,153	7,551	45,704	143
1999/00	44,148	25,232	23,709	17,390	14,367	38,076	7,536	45,611	103
2000/01	52,432	21,321	20,391	21,232	18,418	38,809	7,681	46,490	89
2001/02	60,149	16,763	16,314	28,392	25,861	42,175	8,347	50,522	84
2002/03	66,165	7,528	7,528	39,953	38,210	45,739	9,052	54,791	83

1 Discounted to the middle of injury period at 5.0% pa - inflation of 4% pa and superimposed inflation of 5% pa used in calculations

2 Claims Handling Expenses 15% of Net Claims Cost, Commission 4% of premiums

3 Reinsurance Recoveries assumed to be 2% of gross central estimate

G Glossary of Terms

The table below provides a summary of a number of terms used throughout the report. The terms described below may have different meanings ascribed to them in some other actuarial reports.

Term	Definition
Accident Year	The year (defined in years ending 30 June) in which an accident occurred: eg. a claim occurring on 30 November 2000 is said to belong to the 2000/2001 accident year
Break-even Premium	Expected discounted costs of claims for an accident year plus the expected cost of expenses for that year
Central Estimate	An estimate of the liability which is intended to contain no deliberate bias to either over or underestimate
Claims Cost	Expected net (ie. after allowing for reinsurance) cost of an accident year. This is equal to the net payments to date plus the discounted net central estimate for outstanding claims
Claims Handling Expenses	The expected expenses of administering the claims that have been valued
Development Year	The number of years after an accident year (counting the accident year as year 1) in which an event occurs. For example a claim which occurs on 30 November 1998 but is not reported until 30 November 2000 is said to be reported in Development Year 3
Gap	Difference between discount rate and wage inflation rate
GST	Goods and Services Tax
IBNR	Incurred but Not Reported Claims – ie. claims that have occurred at the investigation date but have not yet been reported to the insurer
Incurred Claims Cost	Net Central Estimate at end of the period + Payments made in the period - Net Central Estimate at beginning of the period
Inflated/Discounted Provisions	The central estimate after allowing for future inflation and discounting, together with an allowance for claims handling expenses and prudential margins

Loss Ratio	Expected Claims Cost as a percentage of Net Earned Premium
Net Earned Premium	The premium (net of reinsurance) earned during the period.
Run-off Claims	Claims occurring prior to the most recent accident year, ie. claims occurring prior to 1 July 2000
PPCI	Payment per Claim Incurred (see Section 3)
Prudential Margin	An additional amount, held above the central estimates to increase the probability of the overall provision being sufficient
Superimposed Inflation	The tendency for claims costs to increase faster than movements in general inflation
Tail	Claims belonging to accident years more than 8 years old at the date of investigation
Total Provision	Net Central Estimate + Claims Handling Expenses + Prudential Margin
TNTS	The New Tax System – includes GST and other legislation, which took effect from 1 July 2000
Ultimate Claims Incurred	The total expected claims for an accident year. This will include all claims reported to the investigation date together with any IBNR claims for the accident year
