

TAYLOR FRY

CONSULTING ACTUARIES

Department of Labour of the Government of New Zealand

Review of the Accident Compensation Corporation
2007 Year End Estimate of Outstanding Claims
Liability and Liability Projections Underlying the
2007 DEFU



Richard G Brookes
Fellow of the Institute of Actuaries of Australia
Fellow of the Institute of Actuaries (London)
Fellow of the New Zealand Society of Actuaries

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1 Conclusion and statement

1.1 Scope

This report documents Taylor Fry Consulting Actuaries' (TFCA) review of the PricewaterhouseCoopers' (PwC) valuation of the Accident Compensation Corporation's portfolio of outstanding claims as at 30 June 2007, as documented in their draft report dated 16 August 2007.

1.2 Statement

Our conclusions are as follows:

- We have reviewed the appropriateness of the data inputs and the data reconciliations undertaken and we are satisfied with these. However, note that a review of the data itself is excluded from our review and we draw no conclusions as to the actual validity of the data;
- We have reviewed the valuation methods used for suitability in the circumstances against current actuarial practice and conclude that they are suitable;
- We have reviewed the assumptions for consistency with available experience and trends. We conclude that they are consistent or, if not, that there are valid reasons for the assumptions used;
- We have reviewed the analysis of movement of valuation results;
- We have reviewed the judgements made for reasonableness and materiality;
- We have reviewed whether key risks, sensitivities and uncertainties, and their implications, have been identified. Where we believe that additional comment was useful we have included it in our report and we have made some suggestions for additions to future PwC reports;
- We have considered whether there have been departures from relevant legislation and Professional Standards and concluded that there are no significant departures;
- We have given weight to all material factors; and
- In the light of the reviews noted above, nothing has come to our attention that leads us to believe that PwC's valuation results are unreasonable.

1.3 Recommendations

1.3.1 Overall quality of valuation

Overall we find the valuation to be well-executed and presented. Whilst we have suggestions to improve the process these are, with the exception of the issues addressed in sections 1.3.2, 1.3.3 and 1.3.6, minor or presentational in nature only.

1.3.2 Scope (section 7.1)

We suggest that known likely future increases in regulated and contracted rates paid for treatment and rehabilitation services, in excess of standard wage/price inflation, which have been excluded from the valuation are itemised on an ongoing basis so that there is no confusion for the various users of the report.

1.3.3 Superimposed inflation (section 5.2.3)

We regard the current allowance as a legitimate assumption although not one that we would adopt on the basis of the information currently available to us. However, it is not demonstrably unreasonable and it may well be that, as further information and future experience emerges, the allowance is shown to be consistent with these. We think that its validity is 'short term' in the sense that

- We expect the material outlined in section 5.2.3.4 to become available over the next year. This will provide more justification for whatever allowance is then adopted. If it is not made available or does not support the current allowance then we expect that the current allowance will need to be increased; and
- We expect the performance of the new project and initiatives to be carefully monitored in a sound quantitative manner. An absence of evidence that they are successfully controlling costs will also require an increase to the allowance.

We continue to recommend that for future PwC reports either:

- The superimposed inflation assumption for social rehabilitation – serious injury is significantly strengthened; or
- Considerably more analysis is included in the report justifying the current assumption.

We acknowledge that the PwC report gives the issue of sensitivity to this assumption more prominence. However we continue to believe that the discussion of the financial significance of various alternative assumptions could be expanded.

1.3.4 Claims expense assumptions (section 5.2.10.2)

PwC have reduced projected growth in expenses by 3% per annum for the first three years. This reduces the expense provision by approximately \$80M. We would prefer to see more analysis and justification in this area

although we acknowledge that the financial impact of this issue is only around \$30M.

1.3.5 Future inflation (section 6.3)

PwC have retained their future inflation assumptions from the previous review. In light of substantial increase in discount rates from March to June 2007 we had expected to see a corresponding increase in future inflation rate assumptions. The most recent NZIER forecasts current at 30 June 2007 suggest that the short term wage inflation rates are about 0.5% higher than those as at 31 March 2007. We note that increasing the short term wage inflation assumption by 0.5% pa would add approximately \$120M to the central estimate.

1.3.6 Risk margin (section 7.3)

It is not apparent that PwC have taken account of the uncertainty in the social rehabilitation - serious injury superimposed inflation assumption and the sensitivity of the estimated liability to it in their assessment of the risk margin.

We continue to recommend that PwC includes a discussion of this issue and its implications for the risk margin in future reports.

1.3.7 Presentation and completeness of information (section 9.2.4)

We also note we have been supplied with several erroneous versions of report appendices. We do not regard this as a major issue since TFCA in its capacity as reviewing actuary is, we believe, the sole user of the report appendices. However, we recommend that the process of producing these be strengthened to prevent this reoccurring.

2 Background and scope

2.1 Status of report

This report is final and replaces a draft issued on 7 September 2007.

2.2 Background

Each year PricewaterhouseCoopers (PwC) undertake two valuations and projections of the outstanding claims liabilities of the Accident Compensation Corporation (ACC) portfolio. The first valuation is primarily based on 31 December data and gives results as at 31 March and 30 June and the second valuation updates the 30 June results for data in the quarter to 31 March. The projections include estimated liabilities and claim payments for each of the next five years.

The results of the first valuation are used by ACC in compiling the Budget Economic and Fiscal Update (BEFU). The results of the second valuation are used by ACC for their financial statements at 30 June and the December Economic and Fiscal Update (DEFU).

The DOL has some supervisory responsibility for the ACC portfolio and as part of this role it has appointed Taylor Fry Consulting Actuaries (TFCA) to review the actuarial reports, valuations and projections which underlie the BEFU and DEFU.

This is the fourth consecutive year that TFCA has undertaken this review.

2.3 Purpose and scope of report

This report is intended to document the results of Taylor Fry Consulting Actuaries' (TFCA) external peer review of the PricewaterhouseCoopers' (PwC) draft report entitled "Accident Compensation Corporation Valuation of Outstanding Claims Liabilities as at 30 June 2007", dated 16 August 2007 (the PwC report) and the valuation underlying that report. Our report should be read in conjunction with:

- The PwC report;
- The PwC report entitled "Accident Compensation Corporation Valuation of Outstanding Claims Liabilities as at 31 March 2007", dated 11 June 2007 (the previous PwC report); and
- The TFCA report entitled "Review of the PricewaterhouseCoopers contributions to the March 2007 Budget Economic and Fiscal Update for the Accident Compensation Corporation", dated 23 July 2007 (the previous TFCA report).

The scope of our review is set out in a contract between TFCA and the DOL (unsigned at the date of this draft report). The relevant part of that contract states that review is to include:

- *“A review of the actuarial methodology and its suitability for the portfolio, data and benefit structure for which it is being used;*
- *A review of the suitability of the main actuarial assumptions (in terms of financial significance) with respect to recent experience implied by the data;*
- *A spot check of parts of the valuation calculations to ensure that they have been correctly executed;*
- *A review of the appropriateness of economic and discount rate assumptions;*
- *Any recommendations of improvement to any areas of process or information provided;*
- *Excludes any independent evaluation of the data; we do not wish to purchase a full independent calculation, or an exhaustive check of all the calculations being reviewed.”*

The review is also to:

- *“Track the movement between the claims liability included in ACC’s 2006 financial statements, the forecast approved for BEFU 2007 and the claims liability to be included in ACC’s 2007 financial statements;*
- *Highlight, explain, and if possible quantify any significant changes in methodology or assumptions between the three calculations; and*
- *Review and comment on the out-year forecasts which will feed through into the 2007 DEFU.”*

It should be noted that this report does not provide an additional valuation.

2.4 Addressee of report

This report was commissioned by Andrew Marshall of the DOL and is addressed to the DOL and Noeline Woof as the senior actuary responsible for the PwC report. DOL have informed us that this report will be available to the general public via the DOL and ACC websites. We draw the attention of all parties other than TFCA and DOL to the comments regarding third parties given in section 2.7.

2.5 Compliance

This report, when read in conjunction with the previous TFCA report is intended to comply with Professional Standard 100 of the Institute of Actuaries of Australia “External Peer Review for General Insurance and Life Insurance” which covers the external peer review of general insurance valuations.

There is no equivalent New Zealand standard.

2.6 Actuary

The actuary responsible for this report is Richard Brookes, employed by TFCA. He is acting as a consultant to the DOL. Richard was employed by

PwC from late 1999 to late 2004 and knows the three signatories to the PwC report in this context. Richard considers that he meets the definition of “external” as set out in section 5 of the Professional Standard 100. He does not believe that the associations set out above constitute a conflict of interest that prevents him from undertaking this review. No limitations have been placed on him over the course of the review. He was associated with (but not directly responsible for) TFCA’s review in 2005 and was responsible for TFCA’s review in 2006. Accordingly he meets the rotation requirement set out in section 5 of Professional Standard 100.

2.7 Reliances and limitations

This report is being provided to the addressees for the purposes outlined in section 2.3. It is not intended, nor necessarily suitable for any other purpose.

Third parties should place no reliance on this report that would create any duty or liability by TFCA to the third party.

We have prepared this report in conformity with its intended use by persons technically familiar with the areas addressed and for the stated purposes only. Judgements about the conclusions drawn in this report should be made only after considering the report in its entirety and in conjunction with the previous TFCA report and PwC reports noted in section 2.3.

Finally, in undertaking this review, we have relied upon the accuracy of information supplied by the parties as outlined in section 3. We have used the information without independent verification. It has been reviewed where possible for reasonableness and consistency.

3 Information supplied

This section describes the data supplied to us from various sources:

- PwC's report dated 16 August 2007 and appendices, supplied by David Gifford of PwC;
- Some updated appendices, supplied by David Gifford of PwC;
- Verbal and email advice on the technical details of PwC's calculations, supplied by David Gifford of PwC;
- A spreadsheet showing active claims and past quarterly payments, in 30 June 2007 values for Weekly non-fatal and in 31 March 2007 values the for medical payment types, hospital rehabilitation and weekly fatal, supplied by David Gifford of PwC;
- A spreadsheet giving details of the serious injury claim cash flows, supplied by David Gifford of PwC;
- Email advice on the technical details of PwC's serious injury calculations, supplied by David Gifford of PwC;
- Discussion with David Gifford of PwC's reasons for the adoption of their future inflation rate assumptions.

We have received the full cooperation of all the parties named in this section and received all the information that we requested.

4 Valuation results and changes from the previous reports

4.1 Changes since the 31 March 2007 valuation

In this section we compare the central estimates given in the PwC report with the projected results at 30 June 2007 based on the previous PwC report (i.e. as at 31 March 2007).

Table 4-1 Central estimates by payment type (all figures in \$M)

Payment type	At 30 June 2007	Past inflation	Variance due to		Projected from 31 March 2007 review
			Future inflation and discount	Experience and non- economic assumptions	
Non fatal weekly compensation	4,314	4	-326	14	4,603
Fatal weekly compensation	389	0	-18	4	404
Medical	928	1	-86	0	1,016
Social rehabilitation	4,987	7	-650	516	5,126
Vocational rehabilitation	132	0	-9	1	140
Hospital rehabilitation	745	1	-69	23	791
Other rehabilitation	481	1	-45	-21	547
Independence allowance	574	1	-69	37	606
Lump sums	262	0	-7	14	256
Ambulance and bulk billed	20	0	0	-1	20
Claims handling expenses	904	1	-88	42	949
Total	13,735	15	-1,368	629	14,458

Table 4-2 Central estimates by account (all figures in \$M)

Account	At 30 June 2007	Past inflation	Variance due to		Projected from 31 March 2007 review
			Future inflation and discount	Experience and non- economic assumptions	
Earners'	2,453	2	-196	71	2,572
Employers'	949	1	-61	7	999
Medical misadventure	886	1	-128	87	926
Motor vehicle	3,964	5	-454	261	4,154
Non earners'	2,398	3	-297	192	2,505
Partnership program	81	0	-2	0	83
Residual non work	938	1	-78	32	983
Residual work	1,829	2	-136	-21	1,983
Self employed	237	0	-16	0	252
Total	13,735	15	-1,368	629	14,457

Note: Totals in the two tables differ due to rounding.

The main issues emerging from Table 4-1 are:

- The large increase (\$516M) in social rehabilitation, arising from an increase in the assumption for superimposed inflation. We address this issue in detail in section 5.2.3;
- The large decrease (\$1,368M) due to an increase in the discount rate. We address this issue in section 6.2;
- A small increase in claims handling expenses. This is due to the incorporation of actual claims handling expense history into the assumptions, where previously only budgeted expenses were available.

The changes by account detailed in Table 4-2 are simply the consequences for each account of the changes described above.

4.2 Changes since the 30 June 2006 valuation

In this section we compare the central estimates given in the PwC report with the projected results at 30 June 2007 based on PwC's 30 June 2006 report.

Table 4-3 Central estimates by payment type (all figures in \$M)

Payment type	At 30 June 2007	Variance due to			Experience and non- economic assumptions	Projected from 30 June 2006 review
		Past inflation	Future inflation and discount	Reallocation of payments		
Non fatal weekly compensation	4,314	77	-266	0	106	4,396
Fatal weekly compensation	389	2	-15	0	19	383
Medical	928	7	-69	-101	28	1,063
Social rehabilitation	4,987	33	-542	18	843	4,635
Vocational rehabilitation	132	2	-7	-21	-17	175
Hospital rehabilitation	745	5	-55	0	52	742
Other rehabilitation	481	3	-35	103	60	350
Independence allowance	574	3	-55	0	85	541
Lump sums	262	1	-5	0	45	221
Ambulance and bulk billed	20	0	0	0	-1	21
Claims handling expenses	904	11	-72	0	59	906
Total	13,735	144	-1,122	-1	1,280	13,433

Table 4-4 Central estimates by account (all figures in \$M)

Account	At 30 June 2007	Variance due to			Experience and non- economic assumptions	Projected from 30 June 2006 review
		Past inflation	Future inflation and discount	Reallocation of payments		
Earners'	2,453	33	-158	0	128	2,450
Employers'	949	-38	-48	0	-47	1,082
Medical misadventure	886	7	-106	0	135	850
Motor vehicle	3,964	36	-376	0	585	3,719
Non earners'	2,398	21	-246	0	430	2,193
Partnership program	81	0	-1	0	-7	89
Residual non work	938	11	-64	0	63	928
Residual work	1,829	81	-110	0	34	1,824
Self employed	237	-8	-13	0	-41	299
Total	13,735	143	-1,122	0	1,280	13,434

Note: Totals in the two tables differ due to rounding.

Obvious issues arising from the tables above are:

- The general deterioration in estimated liabilities due to experience and non-economic assumptions across most payment types and accounts;
- The seemingly anomalous releases from the Employer and Self-employed accounts; and
- The large changes due to future inflation and discounting and the past inflation assumptions.

These issues, with the exceptions of the change to the discount rate and a change to the superimposed inflation allowance for serious injury claims, were addressed in some detail in our previous report and interested readers are referred to that report for the full discussion.

The remaining sections of this report discuss the experience and changes since the March 2007 PwC report and note our opinion on the assumptions adopted.

5 Non-economic assumptions

5.1 Experience

5.1.1 *Translating experience into valuation results*

Broadly speaking, the deviations in actual experience from that expected in the previous report will have three effects on the estimated liability given in the current report:

- The different number of active claims to that expected will result in a different estimated liability, even if the assumptions in the calculation remain unchanged. In broad terms, 2% more active weekly non-fatal claims than expected will result in a 2% higher estimated liability than projected in the previous review;
- The different number of active claims may also induce the actuary to reconsider the assumptions for future continuance rates. For instance more active weekly non-fatal claims than expected may indicate that the continuance rate assumptions should be increased, raising the number of projected future active claims and increasing the estimated liability; and
- More payments per active claim than expected may indicate that the payment per active claim assumptions should be increased, raising the future projected payment levels and increasing the estimated liability.

The distinction between these effects is that the first effect happens automatically as a consequence of the valuation models, whilst the second two arise as a consequence of deliberate decisions by the actuary based on an interpretation of the experience.

5.1.2 *How to interpret experience*

For most payment types there are two crucial components of experience. The first is payments and second component (which we will call the “experience component”) depends on the model being used. For most payment types the model used is a Payment Per Active Claim (PPAC) model, thus the experience component is the number of active claims. However for lump sum models, it is the number of lump sum payments and for a payment decay models there is no experience component. We show in Table 5-1 below the experience since the 31 March 2007 valuation, indicating the experience component as appropriate. For most payment types the period is the 3 months to 31 March 2007 but for Weekly Non Fatal payments the period is the 3 months to 30 June 2007. For brevity, we show the experience aggregated for all accounts although PwC presents results for different groups of accounts. We also exclude the Partnership Plan since the net liability is small. To interpret the table, note that:

- A different number of active claims to that expected will have a flow through effect to payments. For instance, the number of active non-fatal weekly claims is 3% more than expected. The amount of payments is 4% more than expected. Of this 4%, 3% is accounted for by the greater number of active claims than expected and the remaining 1% by payments per claim being 1% more than expected;
- In the absence of an assumption change by the actuary, a different number of active claims to that expected in the quarter before the valuation date will also flow through automatically to the estimated liabilities;
- Projected demographic and economic changes are all taken into account in the expected experience. Therefore, if the actuary's assumptions were perfect and there were no random variation, all the actual versus expected ratios would be 100%; and
- The Scheme experience is the result of a statistical process. Let's use the payment per active claim (PPAC) assumption as an example. The PPAC is a statistical variable with a mean and variability about the mean. The actuarial assumption for a PPAC is the mean but the actual outcome in any quarter may not be equal to the mean/actuarial assumption. Broadly speaking, the most likely outcome is the mean/actuarial assumption but there are probabilities of an outcome much larger or much smaller than this. We refer to this variation about the mean/actuarial assumption as random variation. In the context of Table 5-1, this means that we expect our actual versus expected ratios to vary around 100% but not too much. The larger the payment type, the closer to 100% we should expect.

Finally, we note that 3 months is a very short time over which to judge and interpret experience. Unless there is a significant deviation in experience from that implicit in the valuation assumptions any differences are likely to be the result of random variation or seasonal variation.

5.1.3 ACC experience over the last three months

Table 5-1 Experience over last three months

Payment type	Experience component	Actual experience component	Actual/Expected (%)	Actual payments (\$M)	Actual/Expected (%)
Non fatal weekly compensation	Active claims	44,250	100%	201.9	102%
Fatal weekly compensation	Active claims	4,787	102%	15.1	96%
Medical	Active claims	786,386	103%	100.6	102%
Social rehabilitation					
serious injury	Active claims	3,002	100%	47.9	95%
non-serious injury capital	n/a		n/a	20.8	101%
non-serious injury non-capital	Active claims	15,623	106%	24.3	112%
Vocational rehabilitation	Active claims	15,560	105%	10.5	106%
Hospital rehabilitation	Active claims	44,348	123%	9.5	112%
Other rehabilitation	n/a		n/a	20.5	84%
Independence allowance	Active claims	16,091	99%	7.9	93%
Lump sums	n/a		n/a	9.8	39%

In the light of the discussion above, examination of Table 5-1 highlights the following issues:

- Payments per active claim have been higher than expected for non-fatal weekly compensation;

- Serious injury social rehabilitation payments have been 5% lower than expected;
- The number of non serious injury non capital social rehabilitation active claims and payments per claim are greater than expected;
- The number of vocational rehabilitation active claims has been greater than expected, leading to greater payments than expected;
- There have been significantly more active claims than expected for hospital rehabilitation. Payments have also been higher than expected but by a lower amount;
- Other rehabilitation payments have been 16% lower than expected for the previous three months.

The other deviations in experience are less significant from a financial point of view.

5.1.4 Update process

Table 5-1 also raises another issue. The 30 June valuation makes use of only one more quarter of data than the 31 March valuation. Experience by payment type is clearly volatile over a single quarter. Therefore for each payment type is faced with the decision of whether to change their assumptions in the light of that quarter of experience. They do this in a subjective fashion, depending whether or not they think the experience is sufficiently different from their assumptions to indicate a change in the behaviour of the portfolio. This is not an unusual approach but it does suffer from at least two weaknesses:

- Without a statistical evaluation of the variability in each parameter it is not possible to objectively assess when deviations in experience from the assumptions are statistically significant and therefore merit a change in assumptions; and
- If there is a change in the behaviour of the portfolio but at a less than statistically significant level then the valuation results may not reflect it until the next full valuation.

From a strict theoretical point of view there is a strong argument for always incorporating the new quarter of experience into the assumptions. However, this means that the June valuation would require a full analysis this would be considerably more time consuming than the current process.

In the past we were hesitant to suggest a change to the adopted process since it would involve considerable effort either to put the valuation on a statistical basis that generates estimates of variability or to completely review the assumptions at the June valuation. However, we have been informed that there is a proposal to move to biannual full valuations. We make no comment on the cost/benefit implications of this proposal but note that, if it involves a complete review of assumptions rather than the current update process, then the weaknesses referred to above are largely offset.

5.1.5 ACC experience for the last 3 months but only for the most recent accident year

Table 5-2 Experience over the most recent accident year

Payment type	Accident period ending 31 March	Actual payments (\$M)	Expected payments (\$M)	Actual payments (\$M)
Non fatal weekly compensation	June 2006 - June 2008	108.11	102.94	105%
Fatal weekly compensation	2007	1.53	1.13	136%
Medical	2007	80.18	77.68	103%
Social rehabilitation				
serious injury			n/a	
non-serious injury capital	2007	7.40	7.59	97%
non-serious injury non-capital	2007	15.76	14.07	112%
Vocational rehabilitation	2007	5.23	5.11	102%
Hospital rehabilitation			n/a	
Other rehabilitation	2007	9.88	11.56	85%
Independence allowance			n/a	
Lump sums			n/a	

It is also worthwhile to examine experience for the most recent accident year since this can be an indicator of a trend which may affect the sufficiency of future levy rates. Table 5-2 suggests that the recent experience of payments being greater than expected is more marked for the most recent accident year although it is not at the level at which we would recommend any further adjustment to the levy risk rates emerging from this valuation. Nevertheless, it should be monitored over the year so that any strong emerging trend can be identified.

5.2 The assumptions

5.2.1 Review of the previous PwC report

For the previous TFCA report we applied the following process in respect of the significant payment types:

- We took the data shown in the appendices to the previous PwC report and inflated the payment data to 31 March 2007 with the appropriate index;
- We compared the assumptions given in the appendices with recent averages;
- Where the assumptions adopted appeared inconsistent with these averages we have raised this with PwC and received an explanation;
- We evaluated the superimposed inflation assumptions, given the analysis documented in the PwC report and the trends in the data.

5.2.2 Updating from the previous to the current PwC report

As described in section 5.1.4, for this PwC report the general process followed by PwC has been to compare experience over the quarter to 31 March (30 June for weekly non-fatal payments) and assess whether the experience has been consistent with the assumptions made for the previous PwC report. If there is no significant deviation then the assumptions are left unchanged. We agree with this approach although we note the potential weaknesses described in section 5.1.4.

For our review of this PwC report we have examined the reported experience for each payment type and PwC's reaction to it. We discuss particular issues with respect to the various payment types and other non-economic assumptions in the next sections. Unless we have discussed an issue below, we are satisfied with the assumption adopted or it has little financial significance.

5.2.3 Superimposed inflation for serious injury social rehabilitation

5.2.3.1 Previous allowance

The previous PwC report allowed for assumed future growth of 25% in excess of LCI for serious injury social rehabilitation costs per claimant. This was expressed in terms of a superimposed inflation assumption of 5% per annum for five years, with zero allowance in the long term.

In our previous report, we recommended that:

- Considerably more data and analysis justifying the current assumption be included in the report; or
- The superimposed inflation assumption for social rehabilitation – serious injury be significantly strengthened.

5.2.3.2 Change to allowance

Since our previous report, there has been much discussion between PwC, the auditors and TFCA concerning the assumption.

For this report PwC have added a 1% per annum long term superimposed inflation allowance, in addition to the 25% growth previously allowed. This results in an increase in the valuation estimate of liabilities by approximately \$506M.

In response to PwC's letter that documented the change in valuation assumptions for social rehabilitation – serious injury, TFCA issued a letter dated 8 August 2007 authored by Richard Brookes. The letter summarised the opinion of TFCA concerning the implications of the increased allowance. We reproduce some of this letter in the following sections. We encourage the interested reader to also read our previous report which outlines some key considerations about the importance of superimposed inflation.

5.2.3.3 Uncertainty and superimposed inflation allowances

The setting of superimposed inflation assumption is not a precise science and there is scope for a wide variety of views, depending on the circumstances and the professional judgement of the actuary involved. However, professional and accounting standards require a "best estimate" or mean assumption to be set. It is the validity of the allowance as a best estimate, given the information available, that has generated the recent discussion between ACC, the auditors, PwC and TFCA.

5.2.3.4 Lack of information

The assessment of the required allowance is particularly difficult in this case since, as noted in the PwC letter, currently there seems to be little or no quantitative information on:

- Target levels of care for various injury profiles;

- Current levels of care and how these compare to the target; and
- The impact of the aging of the claimant and carer populations on the expected levels and costs of care.

This information is vital to formulating a soundly based allowance and, in many ways; the issue reduces to an assessment of the correct course of action pending this information becoming available. We comment that such information seems to us important for the proper management of the portfolio so the exercise of sourcing and maintaining it should not be seen as being driven primarily by the need for actuarial information.

5.2.3.5 *Current allowance*

The change to the allowance is to increase the assumption of zero increases after five years to 1% per annum after five years. This seems to us to be a better reflection of the long term risks in the portfolio.

However, we still regard the allowance as being reflective of the likely outcome if:

- The newly introduced project and other initiatives referred to in the draft ACC letter are successful in achieving control of the costs; and
- There are no significant issues regarding the target levels of care and the aging of the claimant and carer populations.

Given that there is no evidence yet that the ACC project and initiatives will be successful, that at least one previous similar project (the Lifetime care planning) appears not to have been successful and that the information referred to above is not yet available, we classify this as an 'all going well' scenario.

We note that another two years of increases at the 13% rate reported for the year to 31 March 2007 would exhaust the 5% per annum for five years part of the allowance.

In this sense the allowance is not one that we would adopt as a 'central estimate' since we do not regard it as allowing for, for instance, the possibility that the new project and initiatives are unsuccessful or slow to start. However, it is not demonstrably unreasonable and it may well be that, as further information and future experience emerges, the allowance is shown to be consistent with these.

Accordingly, we regard the current allowance as a legitimate assumption although not one that we would adopt on the basis of the information currently available to us. We think that its validity is 'short term' in the sense that

- We expect the material outlined above in section 5.2.3.4 to become available over the next year to support the allowance. If it is not made available or does not support the allowance then we expect that the allowance will need to be increased; and
- We expect the performance of the new project and initiatives to be carefully monitored in a sound quantitative manner. An absence of evidence that they are successfully controlling costs will also require an increase to the allowance.

5.2.3.6 *TFCA recommendation*

We continue to recommend that for future PwC reports either:

- The superimposed inflation assumption for social rehabilitation – serious injury is significantly strengthened; or
- Considerably more analysis is included in the report justifying the current assumption.

5.2.4 *Social rehabilitation – non-serious injury non-capital*

The total estimated liability for this payment type is around \$270M.

As noted in section 5.1.5 the number of active claims was 6% greater than expected and payments 12% greater than expected for the March quarter. This is a significant deviation. PwC have elected to leave their continuance rates and PPAC assumptions unchanged from the March review. There has still been an increase of 3-5% in the estimated liability as the increased number of active claims feeds through the model.

We agree with this although we note that the assumptions are uncertain due to the removal of travel costs at the March review. The removal was not retrospective so experience before 2006 was not relevant to the recent portfolio. Accordingly there is some uncertainty in these assumptions and there is a risk that the experience in the March quarter is an indicator that they will need to be changed once more relevant experience emerges.

5.2.5 *Hospital rehabilitation*

The total estimated liability for this payment type is approximately \$745M.

As noted in section 5.1.5 the number of active claims was 12% greater than expected and payments 23% greater than expected for the March quarter. This is a significant deviation and comes after payments of 5% more than expected for the 9 months to 31 December 2006, even after allowing for the superimposed inflation assumption over the year of 6%.

PwC attributed the poor experience up to December to the elimination of budget caps on certain elective procedures in April 2006. They believe that this will lead to an initial spike in the number of procedures before experience settles back to an equilibrium level (which may well be higher than past levels). In contrast, they believe the experience within the most recent quarter is attributable to an unusual seasonality pattern and on this basis they have, for the most part, retained their assumptions from the previous review.

In our opinion the distinction drawn between the 9 months to 31 December and the 3 months to 31 March is uncertain and it could easily turn out instead that the 'spike' is lasting longer than anticipated. We suggest that payments for the next few quarters are monitored closely.

The superimposed inflation allowance adopted by PwC is 6% for 2008, 5% for 2009 and 1% per annum beyond that. In our previous report we noted that, in the context of the increase over the last year of 11% and the strong increasing trends in historic PPACs noted in the previous PwC report there must be a risk that this allowance is insufficient. The experience of the last quarter reinforces this view.

5.2.6 Other rehabilitation

The total estimated liability for this payment type is around \$480M.

Payments have been around 16% less than expected over the quarter to 31 March. This compares to 21% higher than expected over the previous nine months which led to a strengthening in assumptions for the previous review. In addition to the volatile experience, provider travel and backdated attendant costs have recently been included in this payment type.

The change in payments included makes the interpretation of past experience and the choice of assumptions problematic. PwC have responded to the last quarter of experience by letting the reduced number of active claims flow through their models but have not otherwise changed their assumptions. This has resulted in a reduction of the liability estimate of approximately \$20M. We agree with this decision and note that, other things being equal, the experience should stabilise over time as the new payment mix is incorporated.

5.2.7 Independence allowance

The total estimated liability for this payment type is around \$570M.

Payments have been a little less than expected but not at a level which suggests that the assumptions are materially invalid.

The high courts' decision in *Fenemor vs. ACC*, which considered the level of independence allowance for claimants that had already received a lump sum payment for a prior injury, has been estimated by ACC to increase the liability for independence allowance by approximately \$40M. PwC have allowed for this impact by increasing their PPAC assumptions by 6.5%. This increase was applied uniformly across all accounts.

We are comfortable with the approach taken by PwC.

5.2.8 Lump sums

The total estimated liability for this payment type is around \$260M.

Payments have been only 39% of expected over the quarter to 31 March. However, experience for this payment type is dominated by the speed of reporting of asbestos claims. The speed of reporting and ultimate number of these claims is extremely uncertain. PwC have therefore assumed that the ultimate number of claims is similar to the assumption made for the 31 March review so that the slow speed of reporting and settlement means that more claims will be reported in the future. This has led to a small increase in the liability estimate.

We are comfortable with the approach taken by PwC.

5.2.9 Medical costs

Overall, the estimated liability for medical costs is approximately \$930M.

Considered together, experience has been in line with that expected and there has been no significant change to the estimated liability since the 31 March review. However, medical costs are modelled as four separate payment types. There has been a reduction in the liability of approximately

\$10M for 'other medical' costs and an almost exactly offsetting increase for radiology costs. The increase in radiology costs is as a result of:

- Poor experience in the work and non earners accounts; and
- An anticipated increase of 11% in High Tech Imaging costs.

5.2.10 Expenses

5.2.10.1 General

Overall, the estimated liability for expenses is approximately \$904M.

The method used by PwC involves using an allocation of budgeted expenses provided by ACC to express expenses as a percentage of claim payments, where the percentage varies by payment type and development period. For this review they have also received actual expenses by category but not development year. We believe that they have used the actual expenses to calibrate the budgeted expenses although this is not quite clear from the PwC report.

We agree with the methodology adopted by PwC.

5.2.10.2 Short term adjustment

Since the expenses are expressed as a percentage of claim payments, they are assumed to increase in line with claim payments and, in particular, with superimposed inflation. In the previous report PwC took the view that:

- An increase in expenses in line with superimposed inflation over the short term is unlikely;
- The past expenses include a depreciation allowance for ACC's new claim management system which will not be carried forward at its current level.

They therefore reduced projected growth in expenses by 3% pa for the first three years (i.e. a total of 9%). This gave an estimate of expense liability that closely agreed with the methodology used for the June 2006 review (and since superseded). In our previous report, we suggested that the 9% required more quantitative justification.

For this PwC report a table is included demonstrating that superimposed inflation adds a total of 2.5% to claim payments over the next three years. This still leaves an adjustment of 6-7% to be accounted for. PwC have indicated in discussions that the reason for the extra reduction is that the expenses projected by PwC are still in excess of the expenses budgeted by ACC over the next few years. It seems unlikely to us that the ACC budget take good account of the projected claim numbers and activity over the long term and therefore we are wary of reducing the whole expense allowance, which will be paid over many years simply because ACC budgets for the next few years show a lower rate of growth. We would prefer to see more analysis and justification in this area although we acknowledge that the financial impact of this issue is only around \$30M.

6 Economic assumptions

6.1 Total change

We have summarised the changes due to economic assumption changes from Table 4-1 and present them in the table below.

Table 6-1 Analysis of movement from economic effects (all figures in \$M)

	Central estimate
Current report but economic assumptions as at 31 March	15,088
plus change due to	
Increase in discount rate	-1,368
Increase in future inflation	0
Past inflation higher than assumed	15
Current report	13,735

We consider the changes and the adopted assumptions in turn below.

6.2 Discount rate

PwC derive period specific risk free discount rates based on interpolating yields on available Government fixed interest bonds. For this report the yields are as at 30 June 2007.

The effective discount rate has increased from 5.70% pa at 31 March 2007 to 6.61% pa at 30 June 2007, resulting in a decrease in the central estimate of \$1,368M. We have verified the assumption of 6.61% per annum.

Important points to note about changes in the central estimate due to changes in the discount rate are:

- If the discount rate is based on risk free rates at the valuation date then the resulting rate is determined wholly by market conditions. There is no subjective input from the actuary; and
- Changes in the central estimates are accompanied by offsetting changes in the value of Government securities. Therefore the effect of a discount rate change on the overall funding level of the ACC scheme will generally be significantly less than the impact on the central estimate of the liabilities. If the estimated liabilities were matched by Government securities of the same term there would be no impact on the overall funding level of the scheme as a result of discount rate changes. Therefore, volatility in the overall funding level arising from movements in the discount rate is due to
 - ✓ The scheme not being fully funded, and

- ✓ The assets and liabilities not being fully matched (i.e. investment risk).

The PwC report flags a possible change in the way the risk free discount rates are derived. We await this with interest but refer the reader to the previous paragraph. In addition we note that any change will need to be consistent with FRS-35 of the Institute of Chartered Accountants of New Zealand and PS4 of the New Zealand Society of Actuaries.

6.3 Future inflation

PwC's projected Labour Cost Index and Average Weekly Earnings are shown in the flowing table:

Table 6-2 Future inflation assumptions

Index	Year to 31 March				
	2008	2009	2010	2011	2012 & later
Labour cost	3.00%	2.60%	2.60%	2.58%	2.58%
Average weekly earnings	3.80%	3.40%	3.40%	3.38%	3.38%
Consumer price index	2.90%	2.30%	2.30%	2.30%	2.27%

These are unchanged from the previous review.

We find the decision not to amend the inflation assumptions for this valuation a little surprising. In general terms, the Reserve Bank of New Zealand (RBNZ) influences market interest rates with a view to controlling inflation within a preset band. There were two increases of 0.25% to the RBNZ's cash rate between 31 March and 30 June 2007. One might expect that this was in reaction to rising inflation pressures and this indeed seems to be the case. The consensus wage inflation forecasts for the 2007/08 and 2008/09 years in the New Zealand Institute of Economic Research (NZIER) Survey rose from 3.9% and 3.4% in the March survey to 4.4% and 3.9% in the June survey.

Therefore we believe that there was a case for increasing the wage inflation assumptions by 0.5% pa for at least these years. We estimate that this would have increased the estimate of liability by around \$120M. From a pragmatic point of view this would have partially reduced the volatility caused by the changing discount rate.

7 Valuation process and methodology

We fully reviewed the valuation process and methodology in our previous report which related to the March 2007 valuation. Therefore, in this section we concentrate on changes made since the previous PwC report or where we made a recommendation in our previous report.

7.1 Scope

The purposes of the PwC report, as noted in section 1.1 of the report are to:

- To make recommendations which will assist ACC's Board of Directors in setting aside provisions in their 30 June 2007 accounts in respect of the outstanding claim liability for ACC; and
- To provide updated information on projected claim costs required by ACC to assist in levy rate setting for the 2007/08 financial year.

For the first time PwC document in section 1.3 of their report a restriction to their scope relating to allowances for increases in regulated and contracted rates paid for treatment and rehabilitation services, in excess of standard wage/price inflation. This is in line with one of our recommendations and is a disclosure rather than a change in approach. We note that DOL is comfortable with this restriction in scope. Although we understand the reasons for not allowing for such increases we note that it creates:

- Some confusion in what the superimposed inflation allowances in the valuation are actually allowing for; and
- A tension between the various interested parties to the valuation, including
 - ✓ Future levy payers who will fund the cost for past claims of the increases excluded from the valuation
 - ✓ ACC's auditors who have a duty to ensure that the valuation represents an unrestricted central estimate of outstanding claims liabilities.

There is insufficient information for us to assess the effective impact of the restriction in scope. PwC note in a later section of their report, by way of example, that a 10% increase in the cost of home based care would increase the estimated liabilities by around \$230M. It is not clear to us if this is a specific increase that has been excluded but, if it is, then it seems material. We believe that it would be worthwhile to itemise on an ongoing basis specific increases that have been excluded.

7.2 Application of assumptions

We have taken the data as shown in the appendices and applied the assumptions to it for each significant payment type. In theory this should reproduce the cash flows shown in the appendices and indeed it did so to an acceptable degree of precision once the correct appendices had been

supplied. We note that, initially, we were supplied with incorrect versions of several appendices.

Also, we applied the discount rate and aggregated the discounted cash flows to give the total discounted estimated liabilities for each significant payment type. Again these agreed with those shown in the PwC report.

The payment type which we did not verify in this way is ambulance and bulk billed payments.

7.3 Risk margin

PwC's report makes a recommendation on the level of risk margin. The recommended margin is varies by account, averaging 12% across all accounts.

In our previous report we noted that the uncertainty around the allowance for superimposed inflation for serious injuries creates a considerable degree of uncertainty for this valuation. There is a range of likely outcomes for superimposed inflation experience which have considerable implications for the estimated liabilities. It is not apparent that PwC have taken account of the uncertainty in the serious injury superimposed inflation assumption and the sensitivity of the estimated liability to it in their assessment of the risk margin. We recommended that PwC include a discussion of this issue and its implications for the risk margin in future reports. They have not done this.

7.4 Disclosure

In general, we find the PwC reports to be clear, with an adequate discussion of the important issues. Given the bulk of the reports plus lengthy appendices, we hesitate to recommend significant additions. However there are some areas where we think extra material would be helpful, both to the casual reader and for us in our review role. We made four recommendations in our previous report which we hope will be implemented for future reports. Three of these are only relevant to the 'full report' which is based on the valuation as at 31 March and will presumably be implemented for the 31 March 2008 report. See section 9.2.4 for details. The remaining recommendation, dealing with the sensitivity of the results to changes in assumptions, has been partially implemented for this report.

With respect to our recommendation on the sensitivity of the results to various assumptions, we note the inclusion of section 2.3 in the PwC report. This discusses operational issues and areas of uncertainty but it does not quantify their effect, even by way of example. We would much prefer a more complete discussion.

7.5 Compliance

7.5.1 *Professional Standard No 4 of the New Zealand Society of Actuaries*

In our opinion, the PwC reports, considered together, comply with the professional standard.

7.5.2 *Financial Reporting Standard No 35 of the Institute of Chartered Accountants of New Zealand*

In our opinion, the estimated outstanding claim liabilities given in the PwC report comply with the requirements of FRS 35.

8 Comparison of projected liabilities in the current PwC report with those in the previous PwC report

8.1 General

PwC also produce financial projections for future year in Appendix U of their report. These will feed into the 2007 DEFU. We have calculated these from the cash flows in the PwC report and they agree with the figures in PwC's Appendix U.

In this section we track the changes in the financial projections, as reported in:

- The previous PwC report; and
- The current PwC report.

8.2 Potential sources of changes

Any changes in the projected claims liabilities can potentially be caused by changes in:

- The assumptions for the outstanding claims valuation, including
 - ✓ Economic assumptions
 - ✓ Claims assumptions such as the run-off of active claims and payments per claim; and
- The assumptions for the number of claims in future years of exposure, including
 - ✓ The level of future exposure, for instance the number of motor cars, and
 - ✓ The number of claims per unit of exposure.

8.3 Comparison of the previous and current PwC reports

There have been of changes in the assumptions for the outstanding claims valuation (primarily the discount rate and the allowance for superimposed inflation for serious injury) and there have also been some slight changes in the levels of future exposure. Changes in the projected future claim liabilities are shown in the following table:

Table 8-1 Projected claim liabilities

	As at 30 June (\$M)				
	2007	2008	2009	2010	2011
Previous PwC report	14,457	15,272	16,096	17,007	17,966
Current PwC report	13,735	14,542	15,368	16,283	17,251
Increase (%)	-5.0%	-4.8%	-4.5%	-4.3%	-4.0%

Note that we have approximated some of the figures in the above table so as to include projected expense allowances.

The 5% decrease for 2007 is made up of the various factors as shown in Table 4-3. The gradually 'reducing decrease' over future years is consistent with the changes to the non-economic assumptions, which result in higher costs, gradually emerging in future years of exposure.

9 Previous recommendations

In this section we note recommendations from our previous reports which we believe to be still outstanding. We only go back as far as our 2006 reports.

Readers should note that we have made other recommendations which have either been accepted or that PwC have validly argued are either not significant or not relevant. This section of the report is not intended to convey that we believe that our recommendations are ignored, simply to record matters that we believe are still outstanding.

9.1 March 2006 report

9.1.1 *Inflation assumptions*

We noted that the inflation assumptions did not seem consistent with market consensus forecasts current at the date of the valuation. We suggested that either they should be or reasons for deviation be given. PwC accepted our recommendation and we were comfortable with the assumptions used for the 31 March 2007 report. However, there are still some weaknesses in the adopted process and therefore we raise this issue again in section 6.3 of this report.

9.1.2 *Process improvements*

We noted several cases of incorrect appendices being attached to the report. Although we conceded that TFCA were probably the only users of these appendices and that they were of minor significance compared to the main valuation calculations we thought that the process of producing them should be tightened. We raise this issue again in section 7.2 of this report.

9.1.3 *Discount rate*

We noted the practice of deriving period specific discount rates but then re-expressing the liability estimates and discounted cash flows using a single uniform discount rate. This seemed a complex and unnecessary procedure which potentially introduces cross-subsidies between accounts. However, we noted that any such cross-subsidy was minimal so long as the yield curve was reasonably flat. We remain of this view and note that the effect of this issue needs to be assessed at each review so that, in economic conditions when it is material, the issue can be evaluated and addressed.

9.2 March 2007 report

9.2.1 *Superimposed inflation for social rehabilitation - serious injury*

We recommended that for future PwC reports, either:

- The superimposed inflation assumption for social rehabilitation – serious injury is significantly strengthened; or

- Considerably more analysis is included in the report justifying the current assumption.

The assumption has been strengthened for this review. However we continue to make a similar recommendation. We explain this issue in more detail in section 5.2.3 of this report.

We also suggested that the sensitivity of the estimate of liabilities to this assumption should be given more prominence in the report. PwC have partially addressed this but we believe that more could be done. We deal with this issue in section 7.4 of this report.

9.2.2 *Claims expenses*

We recommended that PwC present more analysis in their report relating to their assumptions for claims expenses, including more justification for a 3% pa reduction to expense level for the first 3 years of the projection. More material has indeed been included but we still believe that there is insufficient justification for the 3% pa reduction. We discuss this in section 5.2.10.2 of this report.

9.2.3 *Risk margin*

We recommended that PwC include a discussion of the impact of the uncertainty of the superimposed inflation assumption for social rehabilitation – serious injury on the level or probability of adequacy of their recommended risk margins. We raise this issue again in section 7.3 of this report.

9.2.4 *Completeness of information*

We outlined several areas where we suggested the report be expanded. Many of these we would expect to see addressed in the next full report rather than the shortened 'update' PwC report which is the subject of this review. However, we note them here for completeness:

- Tables showing the changes in the estimated liability for each payment type and account due to non-economic effects split by experience and changes in assumptions;
- More details on the process used to derive the smoothed diagonals. We also suggested that, if they have not done so, PwC should evaluate their method against just using the raw diagonals of unsmoothed data and other methods of smoothing;
- Graphs of recent continuance or decay experience, compared with assumptions, for each payment type as appropriate.