Institute of Actuaries of Australia

Measuring and Understanding Superimposed Inflation in CTP Schemes - What's in our toolkit?

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Abstract

This paper explores superimposed inflation in CTP schemes, using both the NSW and Queensland schemes as case studies. I discuss what superimposed inflation is and the difficulties encountered in measuring it. I then explore the tools available for investigating superimposed inflation – the actuarial models that attempt to measure superimposed inflation at a scheme wide level, the comparable claims model that can aid in identifying areas for further investigation, and file reviews, that can be used to gain a deeper understanding of how behavioural factors may be impacting on settlements.

The paper is set out in the following sections.

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- My colleagues at Finity for their review comments and discussions that have helped form my views.

1 What is Superimposed Inflation?

1.1 A Definition

The definition of superimposed inflation varies depending on who you ask. Pearson and Beynon 2007[1] surveyed actuaries and accident compensation schemes and responses fell into two main camps –

1. "the tendency for benefits for a given injury to increase over time at a faster rate than a suitable standard measure of inflation"
2. "the increase in the total cost of compensation…..that has not been explicitly provided by the actuarial model(s)".

To my mind, the first of these is a definition, whereas the second comes down to a question of measurement of superimposed inflation.

I believe superimposed inflation is the tendency for personal injury awards to increase at a rate greater than normal (economic) inflation. The drivers of superimposed inflation include (but are not limited to):

- Legal decisions/precedents or general scheme dynamics that –
  - Allow a larger group of claimants access to a particular head of damage
  - Increase the average award for a particular head of damage
  - Create a new area of compensation
- An increased level of legal involvement (i.e. a higher proportion of legally represented claimants), which may increase the level of awards to claimants, and will certainly increase legal costs
- Better preparation by plaintiff lawyers, so that a claimant may now access a particular head of damage that may not have been available (to a claimant with similar injuries) in the past
- Claims handling practices of insurers, for example the weight that claims managers give plaintiff versus defendant evidence in terms of formulating offers.

Superimposed inflation is not –

- Legislative reforms that change the level of benefits paid to claimants
- Driven by changes in total claim frequency
- Related to a change in mix of frequency by injury type/severity.

[1] "Superimposed Inflation – Australian Accident Compensation Landscape in 2007" presented to the XIth Accident Compensation Seminar , Melbourne, 2007

1.2 Why is it Important?

Understanding the level of superimposed inflation in a scheme is important for good scheme management and as input into valuation and pricing assumption selection. It is arguably the area of most subjectivity in forming a view of how well a scheme may be performing. This is due to –

- problems encountered in measuring it (see section 2)
- the nature of superimposed inflation - it tends to occur in bouts, however for pricing and valuation purposes, a smoothed long-term rate is normally adopted.

Consideration also need to be given to the apparent disconnect between past levels of superimposed inflation and what reasonable expectations for future superimposed inflation may be i.e. just because superimposed inflation has been high in the recent past doesn't necessarily mean it will continue to be so. Having a good understanding of what is driving superimposed inflation and why are key to making sound judgments about how to respond.

The difficulties associated with measuring and understanding superimposed inflation can cause tensions between insurers, regulators and other stakeholders. So what do we have in our toolkit to help us?

1. actuarial models - these are complex statistical models that attempt to measure superimposed inflation at an overall scheme level
2. comparable claims models - in the comparable claim model, the average claim sizes of like claims are compared over time i.e. those with the same/similar detailed injury codes. Later in the paper I present the claims information in this way using both the NSW and Queensland CTP schemes as case studies. I compare the average claim sizes of claims with four specific injuries (whiplash only claims, whiplash plus lumbar strain, whiplash plus thoracic strain, seat belt injuries).

   This approach can be used not to measure the overall level of superimposed inflation in a scheme, but to demonstrate where superimposed inflation may be present. The benefits of this approach are –

   (a) It can aid in identifying areas for further investigation

   (b) It is simple to do and easy to understand.
3. file reviews – once the actuarial models and comparable claims models have identified areas for further investigation, targeted file review exercises can be undertaken. These file reviews can provide valuable information on –

   (a) how cases are being prepared, by both the defendant and the plaintiff

   (b) how behaviours of the two parties may be impacting on settlements, and if these behaviours have changed.

   This information can be used to inform changes in claims management practices or other aspects of scheme design to bring superimposed inflation under control.

2 What are the problems in measuring superimposed inflation?

This section discusses how actuaries measure superimposed inflation and some problems encountered with these techniques.

2.1 How do actuaries measure superimposed inflation?

Historically, actuaries have measured superimposed inflation by building models of average claim size that allow for key explanatory factors (e.g. injury severity, legally represented status), with the superimposed inflation being measured as any residual observed increase in claim size.

As statistical techniques have evolved, actuaries have turned to complex data mining techniques. These data mining techniques have the ability to measure the average claim size of like groups of claims over time using more detailed explanatory factors (e.g. age, sex, employment type), thus arriving at a measurement of superimposed inflation.

However, difficulties can be encountered in measuring superimposed inflation, whether the more basic or highly statistical approaches are used. The two main causes of measurement difficulty are –

- Falling claim frequency and the resulting impact on the types of claims occurring even within an injury severity group[2]
- Changes in the order of claim finalisation – which tends to be exacerbated when claims frequency has fallen.

Even if superimposed inflation has been measured, this often doesn't resolve important questions around the drivers of the superimposed inflation.

The model structure used can also "hide" some elements of superimposed inflation.

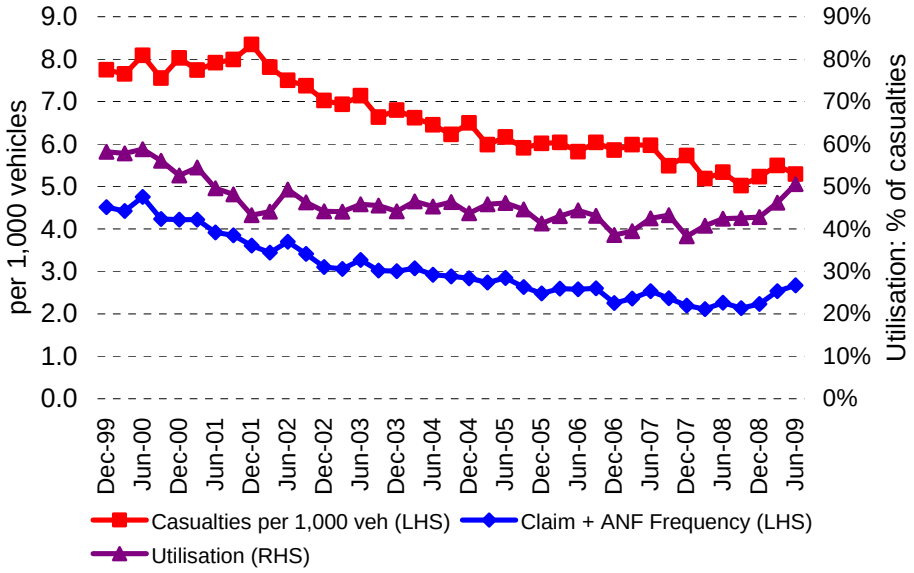
Each of these is discussed further below.

2.2 Falling claim frequency

In both the NSW and Queensland CTP schemes, claim frequency has fallen dramatically, particularly following legislative change: the NSW Motor Accidents Compensation Act 1999 ("MACA") and the Queensland Civil Liability Act 2003 ("CLA"). This has partly been driven by reducing casualty rates in both jurisdictions, but not solely – utilisation (the number of claims per casualty) has also fallen as shown in Figure 2.1 and Figure 2.2.

[2] Claims are coded with detailed injury codes that indicate the specific injury suffered. Embedded within these injury codes are indicators of the injury severity (a number from 1 to 6, with 1 being "minor", 2 being "moderate", etc, up to 6 being "maximum"). Some claims have an unknown injury severity either due to insufficient medical evidence available to code the claim (early in the life of the claim) or due to the nature of injuries (e.g. stress claims)

Figure 2.1 - Casualty Rates and Utilisation – NSW*



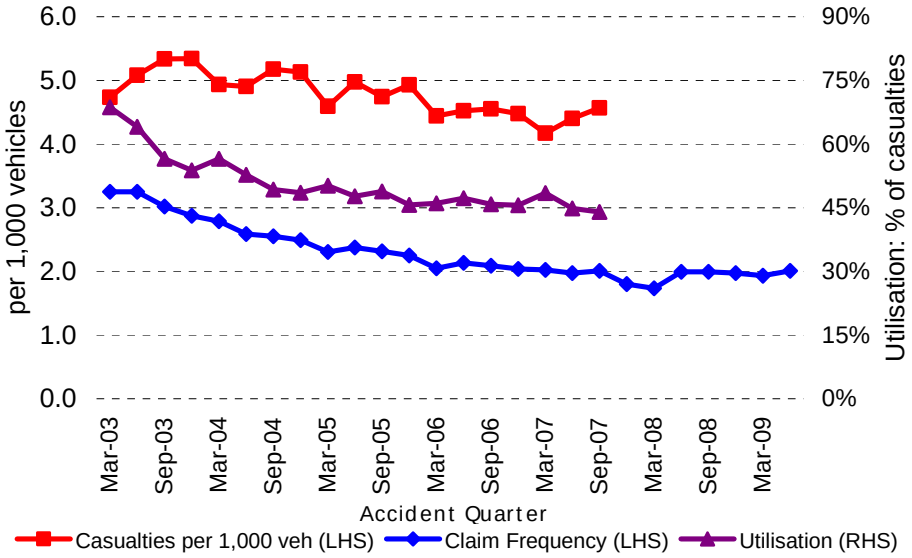
** Casualty data includes all casualties*

Scheme utilisation fell sharply in the first two years following the introduction of MACA, and subsequently declined marginally until December 2008. The bulk of this change in utilisation was due to reducing claim frequency for claims with low injury severities, with smaller reductions in frequency for the higher severity claims. The early reduction is probably a direct result of MACA's aim of removing general damages from less severe claims.

Utilisation increases in the last three quarters shown coincide with the implementation of the MACA 2007 amendments[3] (noting the December quarter is usually seasonally low). These amendments increased the level of payments that could be made to injured persons via the ANF process (i.e. without the formal processes that come with lodging a claim). Hence I expect this increase in utilisation to be the result of increased reporting of small claims, where the claim process itself would previously have been a deterrent to claiming.

[3] Motor Accidents Compensation Amendment Act 2007

Figure 2.2 - Casualty Rates and Utilisation – Queensland*



** Casualties available to September 2007 only and include fatalities, hospitalisations and other medical treatments*

As for NSW, utilisation fell sharply in the first couple of years following the introduction of the new legislation and was reasonably stable over the next two years. Unfortunately, casualty statistics are not available beyond September 2007.

Again, the bulk of the change in utilisation after the legislative change was due to reducing claim frequency for claims with low injury severity and smaller reductions for higher injury severity claims. This is probably largely due to the CLA which reduced general damages significantly for low injury severity claims.

While actuarial models can normalise for injury severity, the injury severity is not a perfect proxy for the impact the injury will have on the claimant and the resultant size of the claim (i.e. some severity 3+ claims have a low cost as, while they have a high injury severity rating, there is not necessarily a high degree of ongoing disability). As such, with the smaller claims coming out of the scheme due to legislative driven falls in frequency, the remaining mix of claims within each injury severity can change significantly (particularly for severity 1 claims). It is this change in mix within injury severity that causes problems in measuring superimposed inflation. Are observed changes in average claim sizes for a particular injury severity solely due to a different mix, or is there an element of superimposed inflation as well?

In addition, operational time is usually one of the key data inputs into the models used to measure superimposed inflation. Operational time is measured as the number of claims finalised for an accident period relative to the ultimate number of claims for that same period. It reflects the 'order' in which claims finalise – claims that finalise first have a lower operational time, while claims that take a long time to finalise have a high operational time. Changes in claim frequency and mix can mean that claims measured in a particular operational time interval (OTI) for one accident year will not be comparable to claims in that same OTI in a subsequent accident year.

2.3 Changes in order of finalisation

In addition to the OTI problems encountered with changing claim frequency, the problem can be exacerbated by changes in the order of finalisation. In both NSW and Queensland in the period following the introduction of MACA and the CLA legislation, there have been substantial changes in the order of finalisation of claims –

- In Queensland, there were delays in getting the regulations surrounding the Injury Scale Value (ISV) in place (see Section 3.2), so there were few settlements of more serious claims in the first few years following the introduction of the CLA.
- In both jurisdictions, insurers' claims handling practices and plaintiff lawyer's processes have evolved post-legislative change, resulting in further changes to the order of finalisation. Anecdotal evidence suggests that larger claims are now being settled earlier than they were in the past.

This change in order of finalisation has obvious impacts for measuring superimposed inflation using operational time as an explanatory factor.

2.4 Cause versus effect

In trying to identify the drivers of superimposed inflation (in order to implement remedial action), the actuarial models may not be effective at revealing the causes of superimposed inflation. The models can estimate how much superimposed inflation is present overall, but cannot necessarily tell you why the superimposed inflation exists. A couple of examples –

- in NSW, one hypothesis is that the dispute resolution system (CARS) is a key source of superimposed inflation. However, claims that go to CARS for a quantum assessment make up only a small proportion of settlements by number. As such, CARS claims are not "statistically significant", hence the actuarial models may not identify CARS as a driver of superimposed inflation. While CARS is not revealed as causal in the modelling, CARS decisions may have a flow on effect to other claims
- behavioural changes by claims managers and plaintiff lawyers are not easily captured by the data items collected in respect of claims. These behaviours can have a large impact on claims costs, but are not easily measured or quantified.

This can create tensions when one set of stakeholders is of the view that superimposed inflation is the result of a particular element of scheme design, but the actuarial advice does not reveal it as such.

2.5 Model structure

Earlier in the paper I discussed how some view superimposed inflation as "the increase in the total cost of compensation…..that has not been explicitly provided by the actuarial model(s)". This view can "hide" some superimposed inflation – for example, if the

legally represented status of a claim is incorporated into the model (as it usually is), then any increase in the level of legal involvement will not "count" as superimposed inflation.

The extent to which this is a problem (or not) will depend on both –

- the purpose for which superimposed inflation is being measured – if the total level of superimposed inflation is required for understanding scheme dynamics as part of good scheme management for example, then the models may understate the actual level of superimposed inflation
- the model structure of the projection models (pricing or valuation models) - if the projection models and the superimposed inflation models follow a similar structure in terms of the variables that are explicitly modelled, then there is no problem. However if, for example, the legally represented status was part of the superimposed inflation model but not the projection model, then the superimposed inflation allowance could be too low.

In addition, any modelling will be constrained by the availability (or lack thereof) and quality of explanatory variables in the data.

2.6 Why use actuarial models?

The problems listed above do not invalidate the use of actuarial models of superimposed inflation. Rather, actuarial models should be used to –

- provide an indication of the existence of superimposed inflation (or not), without being overly definitive about quantum. I suggest superimposed inflation be classed as either –
  - very high – measured in excess of 20% p.a.
  - high - measured between 10% and 20% p.a.
  - moderate - measured between 5% and 10% p.a.
  - low - measured as less than 5% p.a.,

  noting that the cut-offs shown above are in themselves are somewhat arbitrary.
- provide an indication of where superimposed inflation is apparent. What are the drivers of any superimposed inflation, and are these drivers likely to cause superimposed inflation to continue in the short/medium/long term?
- direct further investigations into causal impacts (such as using comparable claims models and file reviews).

3 Actuarial Model Results

In this section I present the results of the actuarial measurement of superimposed inflation in both NSW and Queensland. This modelling has been undertaken by my esteemed colleagues, Bo Wang and Aaron Cutter, and a description of the approach used can be found in Appendix A.

3.1 NSW

Background

MACA came into effect on 5 October 1999 with the intention to keep premiums affordable by restricting the level of non-economic loss compensation in cases of minor injuries, while preserving principles of full compensation for those with severe injuries involving ongoing impairment and disabilities.

It also created –

- the Claims Assessment and Resolution Service (CARS), established to reduce the need for injured persons or insurers to commence legal or court proceedings. CARS assesses disputes over issues of liability and amounts of damages. Court proceedings cannot commence unless the claim has been referred to CARS and either –
  - an exemption certificate is issued (in the circumstances of disputes over fault, contributory negligence is involved, nominal insurer claims, allegations of fraud)
  - one of the parties does not accept the decision on issues of liability
  - the claimant rejects the CARS assessment regarding quantum (noting quantum assessments are binding on the insurer)
- the Medical Assessment Service (MAS), established to resolve medical disputes as they arise during the course of a claim, and usually before proceedings are commenced at CARS or court. MAS assesses disputes between insurers and claimants over reasonable medical treatment, whether required treatment is due to the injury sustained, and whole person impairment assessments.

Both CARS and MAS are intended to facilitate earlier settlement of claims.

Measured Superimposed Inflation

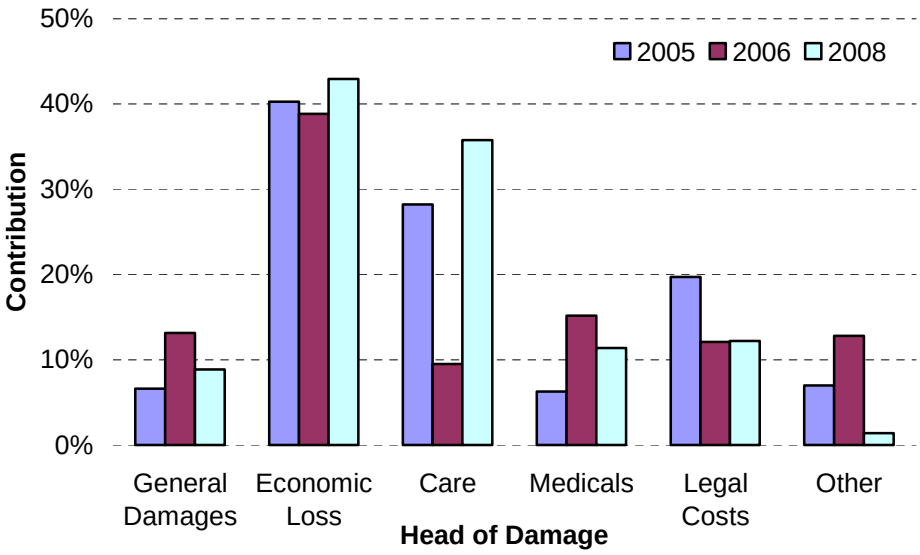
We have measured superimposed inflation in NSW as shown in the following graph. As discussed in Section 2.6, while we have quantified the level of superimposed inflation present, we would view the results as indicative rather than definitive.

Figure 3.1 - Total Measured Superimposed Inflation – NSW

Our modelling indicates that there were moderate levels of superimposed inflation present in the 2005 and 2006 settlement years, and high levels in 2008. We have measured only low levels of superimposed inflation in 2007 and the first half of 2009.

The following chart provides an indication of the sources of superimposed inflation by head of damage for the 2005, 2006 and 2008 years.

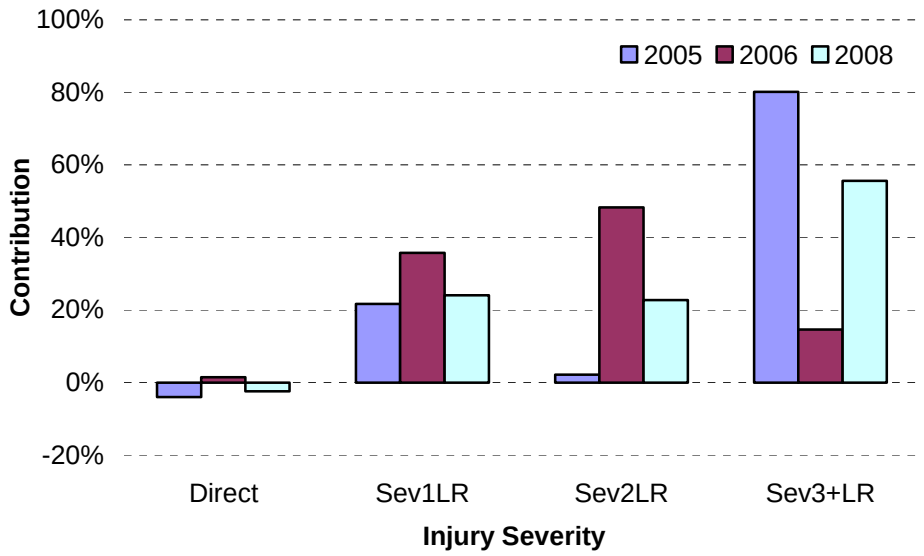
Figure 3.2 – Contribution to SI by Head of Damage - NSW



The main contributors to superimposed inflation have been economic loss and care, with lesser contributions from the other heads. The contributions were broadly similar across the three years, although the care contribution for 2006 was lower than for the other two years shown.

The following chart provides an indication of the sources of superimposed inflation by injury severity (noting we have split claims into those with and those without legal representation and claims of unknown severity are included with severity 1 claims).

Figure 3.3 – Contribution to SI by Injury Severity - NSW



The contribution of each injury severity has not been consistent over the three years shown. There have been consistently high levels of measured superimposed inflation for Severity 1 claims with legal representation (Sev1LR), contributing around 25% to 35% of total superimposed inflation. Superimposed inflation in severities 2 and 3+ has been somewhat variable.

Summary

In NSW over the period examined, the overall level of superimposed inflation has been moderate. The main contributors have been –

- the economic loss and care heads of damage
- severity 1 claims with legal representation.

3.2 Queensland

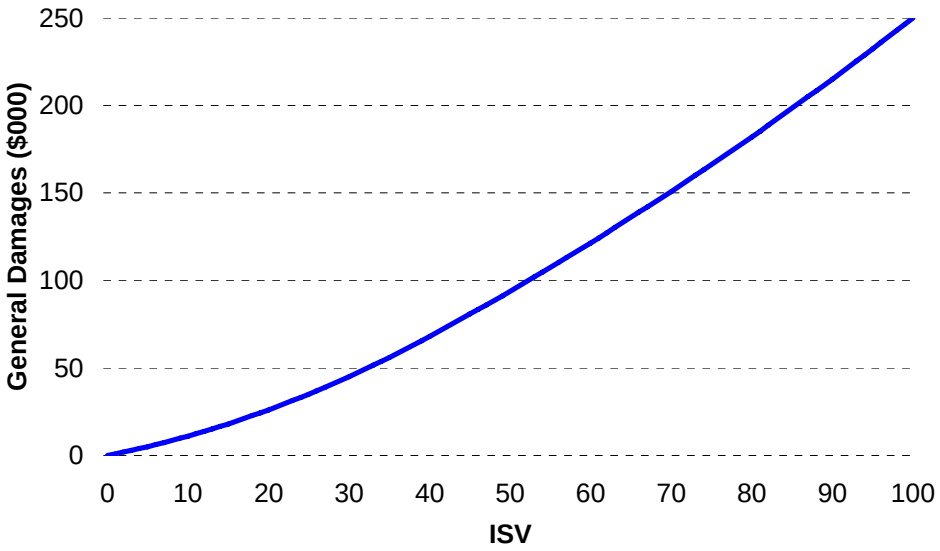
Background

The CLA came into effect on 2 December 2002 with the main provision being to reduce the level of general damages awards, but to also introduce some caps and thresholds on loss of earnings, gratuitous services, and loss of consortium/servitium.

The provisions relating to general damages introduced the concept of an injury scale value (ISV), where general damages must be assessed based on the ISV score. The ISV is a number between 0 and 100, reflecting the severity of the injury. The ISV rules are provided in Regulations and indicate the number of points a claimant can receive for a

single injury (a range is provided, with descriptors of what to take into account to assess the claimant at the upper or lower end of the range). If the claimant has multiple injuries, "uplift" can be awarded to the dominant injury's ISV to increase the overall score awarded. The ISV score then translates directly into a general damages amount (as shown in Figure 3.4) using a formula provided in the Act.

Figure 3.4 – General Damages for Given ISV

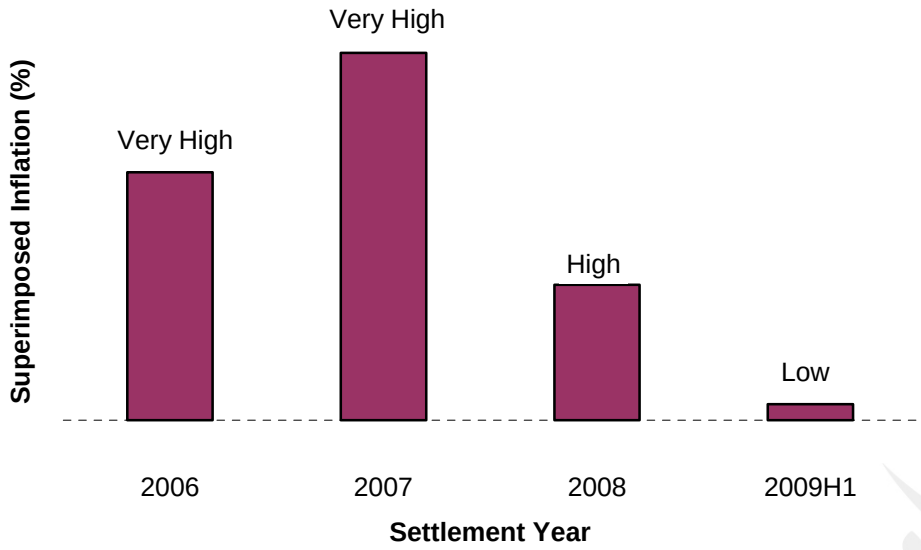


These provisions severely curtailed the level of general damages that could be awarded at the lower end of the scale.

Measured Superimposed Inflation

We have measured superimposed inflation in Queensland as shown in the following graph.

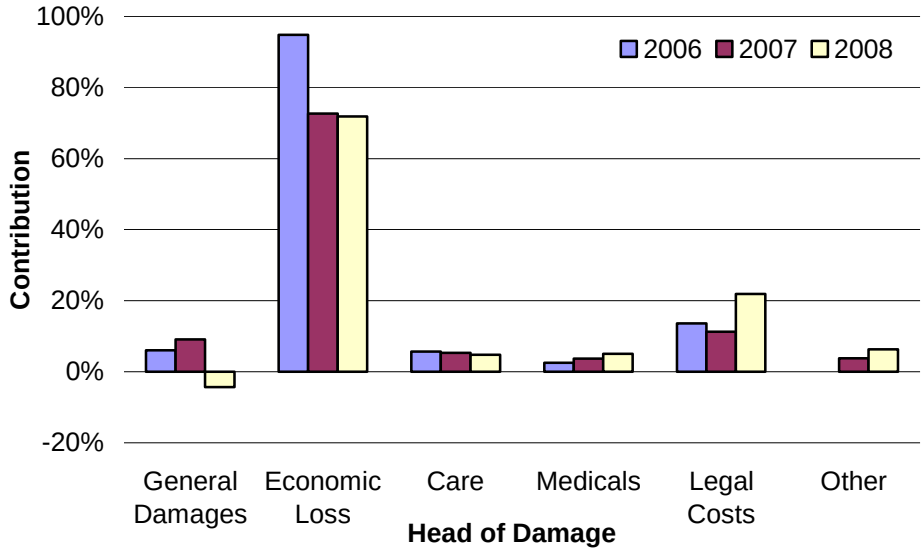
Figure 3.5 - Total Measured Superimposed Inflation - Queensland



Our modelling indicates that there were high to very high levels of superimposed inflation present in the 2006 to 2008 settlement years, and a low level of superimposed inflation in the first half of 2009.

The following chart provides an indication of the sources of superimposed inflation by head of damage for the 2006 to 2008 years.

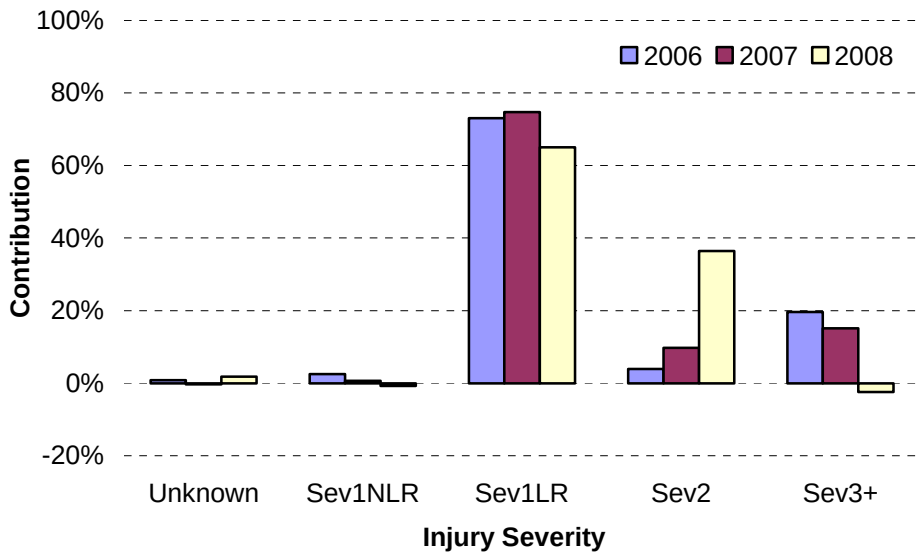
Figure 3.6 – Contribution to SI by Head of Damage - Queensland



By head of damage, the main contributor to superimposed inflation was Economic Loss (both past and future). Legal costs also made a significant contribution. The other heads of damage have made small contributions to superimposed inflation.

The following chart provides an indication of the sources of superimposed inflation by injury severity, noting we have split severity 1 into those with and those without legal representation.

Figure 3.7 – Contribution to SI by Injury Severity - Queensland



This analysis shows some changes in the types of claims by injury severity contributing to superimposed inflation. Severity 1 claims with legal representation (Sev1LR) have been a large contributor across all three years, while severity 2 claims have contributed an increasing proportion each year. Severity 3+ claims made significant contributions in 2006 and 2007, but no contribution in 2008.

Summary

In Queensland over the period examined, the overall level of superimposed inflation has been very high. The main contributors have been –

- the economic loss head of damage
- severity 1 claims with legal representation.

4 Comparable Claims Model

This section shows the average claim size over time for claims with similar injuries.

Some notes on the data –

- All settlement years are years ending 30 September (for NSW) and 31 December (for Queensland), noting that the 2009 year is the partial year ending 30 June 2009. For NSW, the settlement date used is an amalgam of the settlement date, the date of last payment, and the date finalised, while for Queensland we have used the date finalised.
- All amounts shown have been inflated with wage inflation to 30 June 2009
- I have excluded the following claims –
  - claims settled for nil cost
  - large claims i.e. claims settled for more than $1 million (NSW) and $0.5 million (Queensland) in June 2009 values
  - ANFs (in NSW)
  - nominal defendant claims, interstate claims and workers compensation only claims.

4.1 Injuries shown in context

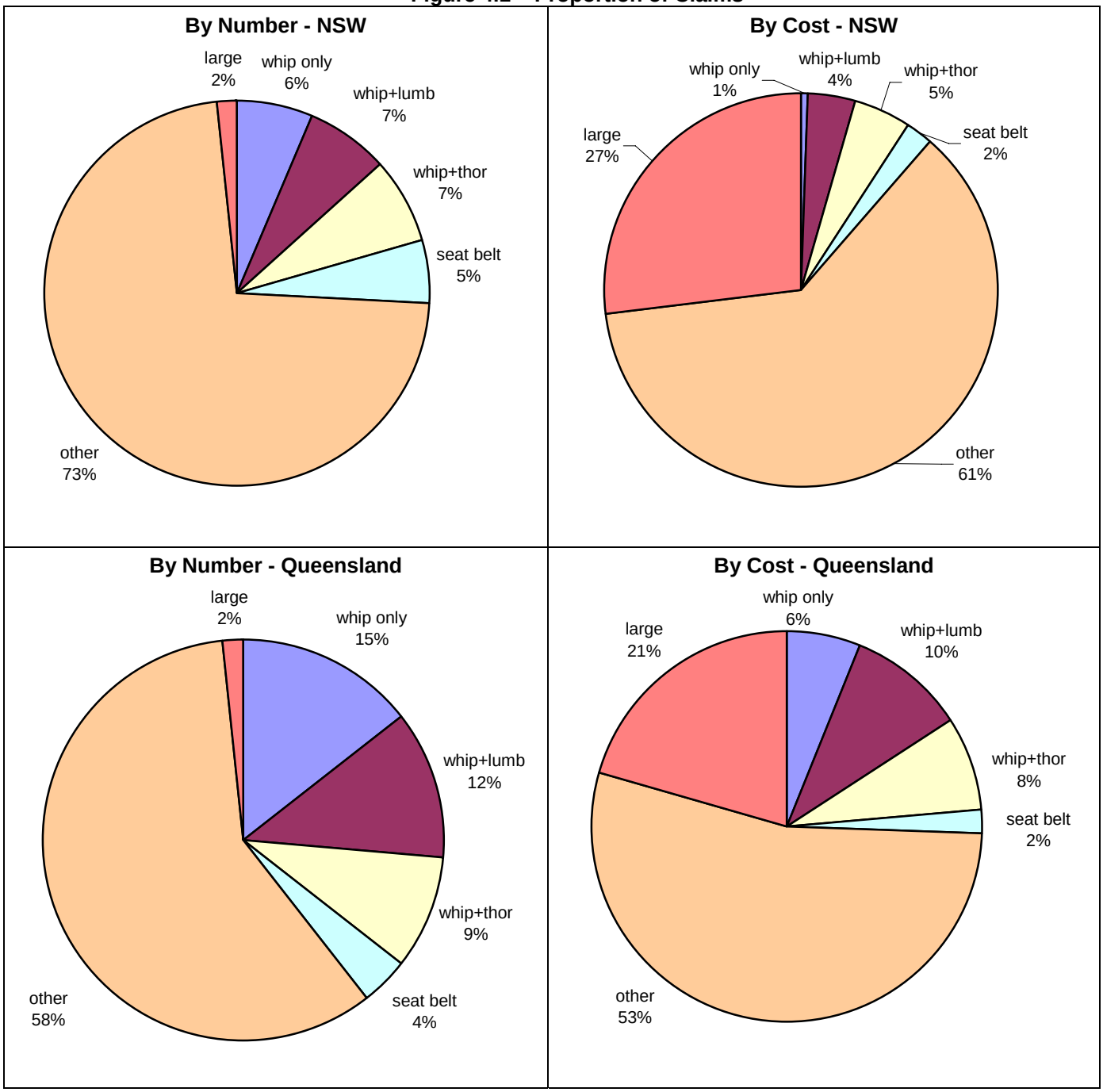
The four injuries shown in detail in this section are all injury severity 1 claims and are –

1. Whiplash only claims (Abbreviated Injury Scale 1985 Revision (AIS85) injury code of 70101.1 present in the first injury code, no other injuries present)
2. Whiplash as the most severe injury (AIS85 of 70101.1 present in the first injury code) plus strain of the lumbar spine as second most severe injury (AIS85 of 76101.1 present in the second injury code). Third and subsequent injuries may or may not be present
3. Whiplash as the most severe injury (AIS85 of 70101.1 present in the first injury code) plus strain of the thoracic spine as second most severe injury (AIS85 of 73101.1 present in the second injury code). Third and subsequent injuries may or may not be present
4. Seat belt injuries as the most severe injury (AIS85 of 50101.1 present in the first injury code). Second and subsequent injuries may or may not be present.

I have chosen these claims as they are high in volume and the injuries sustained are reasonably homogeneous (certainly compared with other types of injury). In addition, when superimposed inflation is present in a scheme, it has tended to be these claim types that have exhibited higher levels of superimposed inflation. These claim types can, therefore, be used as a "litmus" test regarding the presence of superimposed inflation in the lower injury severity claims.

The following graphs show the proportion of claims by number and by settlement value that these four injury types make up.

Figure 4.1 – Proportion of Claims*



** excludes interstate, nominal defendant and workers compensation only claims*

Overall, the four injuries examined make up –

- For NSW, around 25% of settlements by number (out of a total of around 7,500 per annum) and just over 10% by cost
- For Queensland, around 40% of settlements by number (out of a total of around 6,000 per annum) and almost 25% by cost.

4.2 Limitations on the Analysis

While in the following analysis I compare average claim sizes of claims with broadly the same injuries, the claims may not be directly comparable for the following reasons –

1. for the whiplash only claims, the injury coding of the set of claims is identical from one period to the next. For the other three injuries however, there may be differences in the injury coding for the third and subsequent injuries (whiplash plus claims) and the second and subsequent injuries (seat belt injuries). As such, the claims may not be exactly "like with like". In addition, any changes in injury coding protocols over time may also result in comparisons not being exactly like with like
2. I have not attempted to normalise for claimant characteristics that can have a significant bearing on claims costs (i.e. sex, employment status, age, etc). I have checked if the mix of settlements by each of the key claimant characteristics has changed over the period examined and concluded that, for each of the injury groups, there has been no significant change in mix by claimant characteristic.
3. I have investigated whether there is any bias in the analysis that may result from the NSW and Queensland schemes still maturing (thus having an increasing proportion of older and thus possibly larger claims settled in each successive settlement year). Appendix B shows the proportion of claims costs in each settlement year for the four injury types broken down by settlement delay (number of years between accident and settlement). I found that –
   (a) For NSW, the proportions of cost in each delay band are similar for each settlement year for each injury
   (b) For Queensland, maturing of the scheme is still evident, with an increasing proportion of costs in the 4+ years delay. This is not unexpected given that the CLA did not come into effect until more than four years after the MACA. As such, for the Queensland analysis presented in this section I have excluded all claims with settlement delays of more than 4 years.

   Even though I have attempted to normalise for the maturing of the scheme, the approach is somewhat simplistic. Hence some bias may remain.

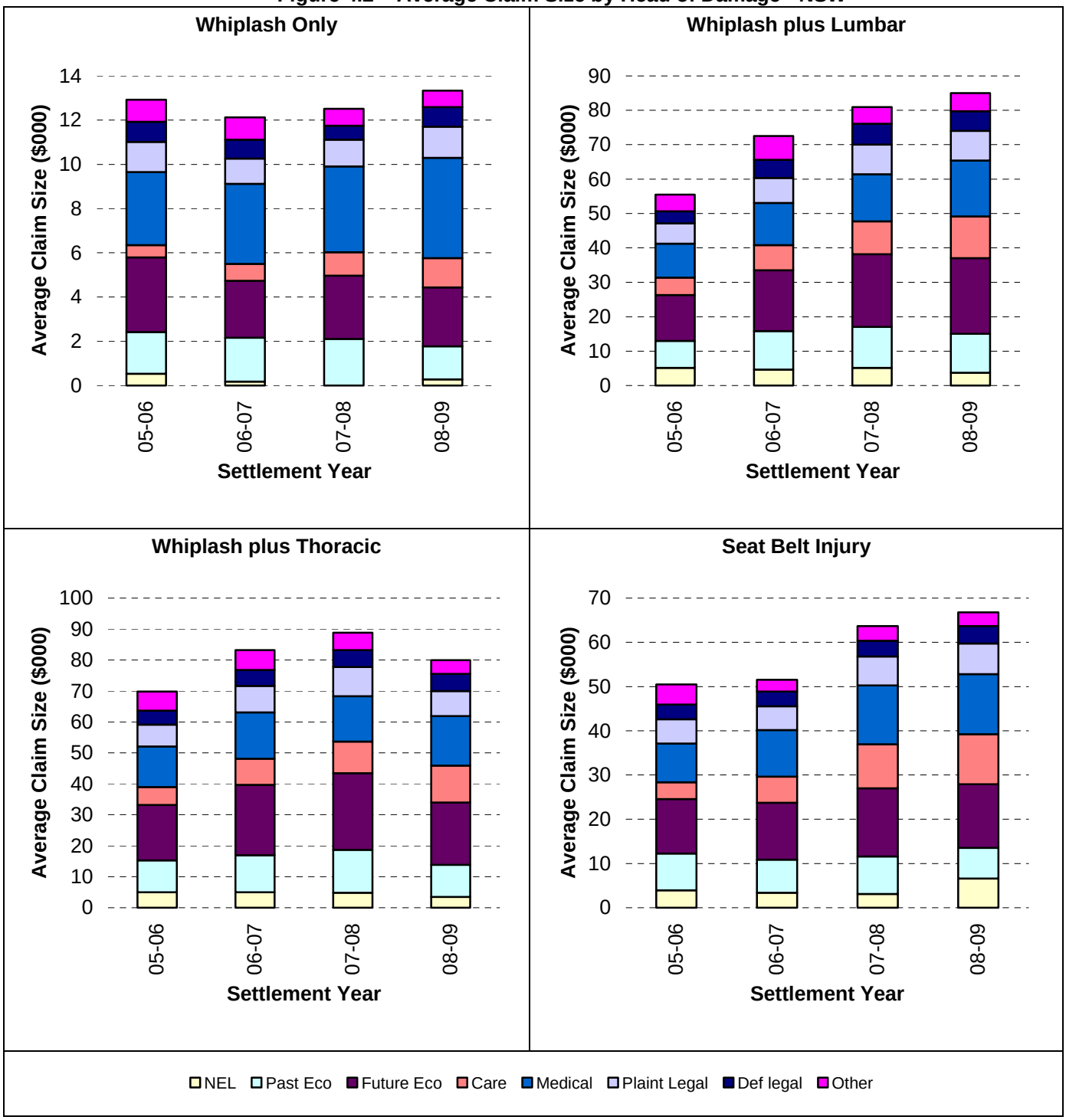
Given the above, some care should be exercised in interpreting the results and no conclusions should be reached as to the actual quantum of superimposed inflation in the claims shown. However, I believe that the analysis is sufficiently robust that conclusions can be reached as to the presence and drivers of superimposed inflation in these claims.

4.3 NSW

Average Claim Size by Head of Damage

The following graphs show the average claim size by settlement year for the four injury groups broken down by head of damage.

Figure 4.2 – Average Claim Size by Head of Damage - NSW



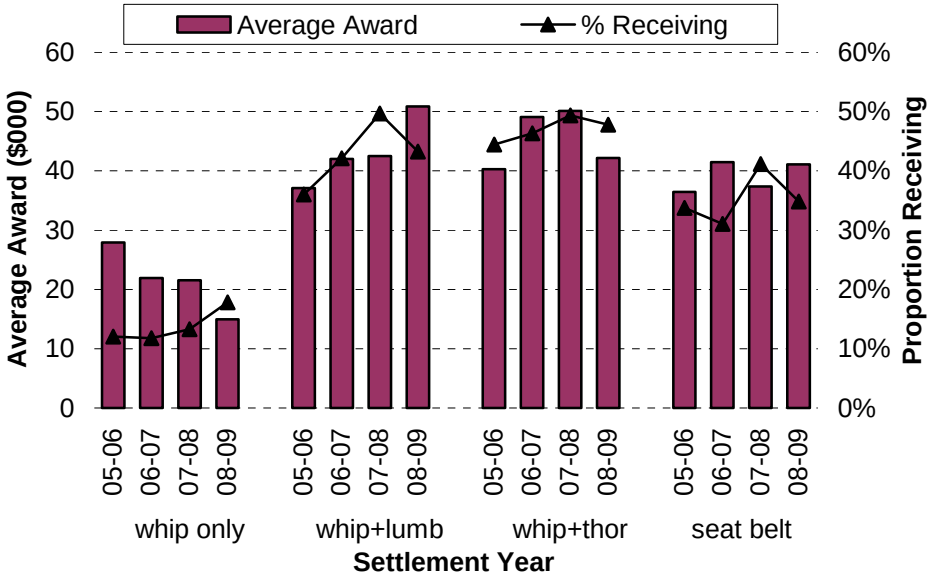
Overall average claim size for whiplash only claims has been reasonably stable, however I note that the Care component of these claims has increased.

For the three other injuries, the average claim size has increased over the period (although for whiplash plus thoracic the average size for 2008/09 is lower than the two previous years). Consistent with our findings from the actuarial models presented in section 3.1, the bulk of the increase has come from future economic loss (FEL), care, medicals and plaintiff legal costs.

Detail by Head of Damage

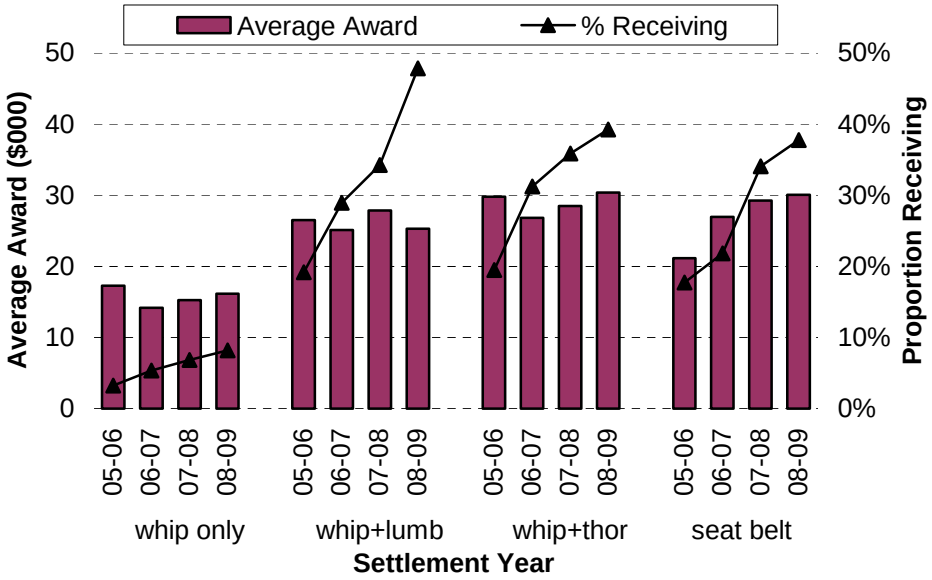
I have examined in more detail trends for those heads of damage that have increased (i.e. FEL, Care, medicals and plaintiff legal costs). I have examined the average award (for those receiving the particular head of damage) and the proportion receiving the head of damage.

Figure 4.3 – Average Award and Proportion Receiving – FEL in NSW



For FEL, the average award for those receiving FEL shows no consistent trends. However, the proportion of claimants receiving the head of damage has increased for each of the four injury types.

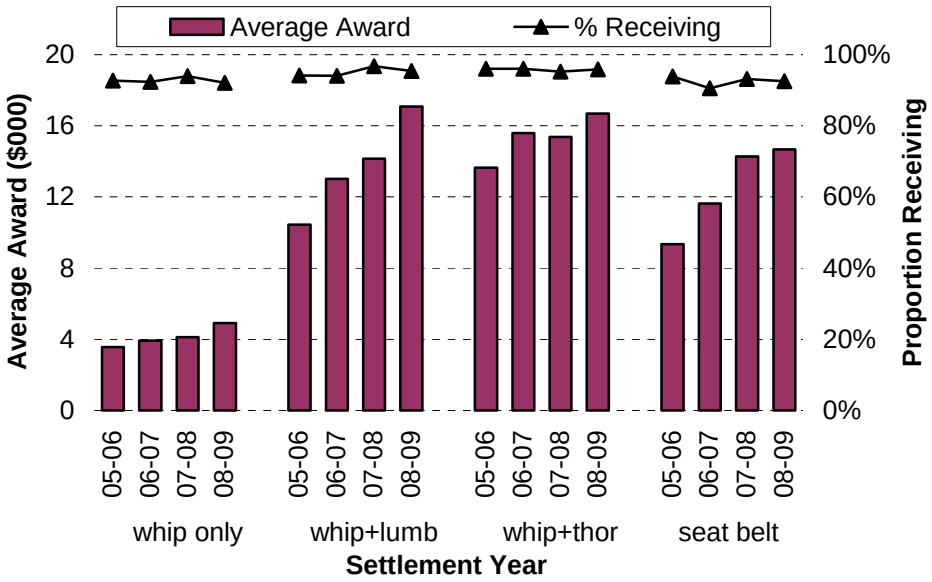
Figure 4.4 – Average Award and Proportion Receiving - Care in NSW



Increases in the care component of claims costs have been driven by strong increases in the proportion of claimants receiving this head of damage. The proportion receiving has at least doubled over the period for each of the four injuries.

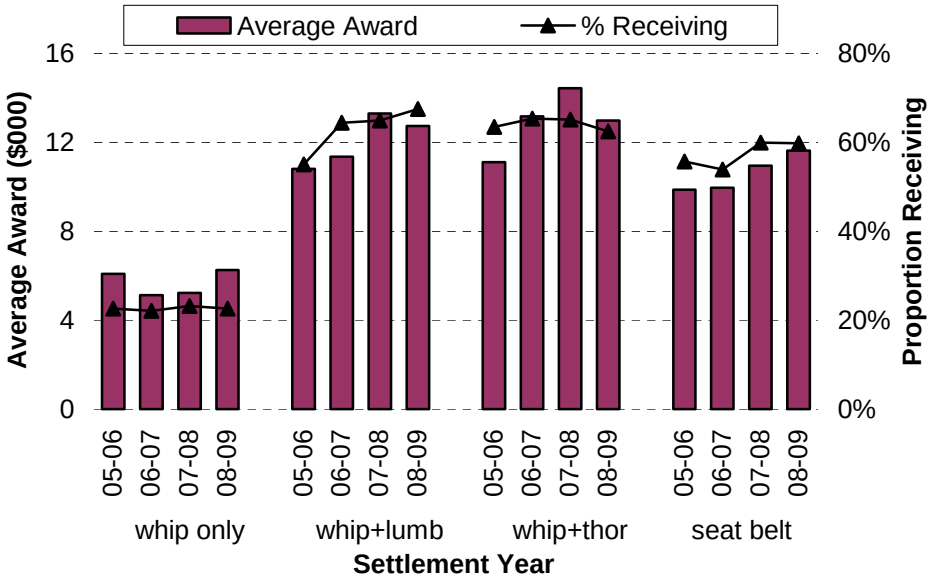
The average award has been relatively stable for the whiplash injuries while it has increased for seat belt injuries.

Figure 4.5 – Average Award and Proportion Receiving - Medicals in NSW



Most claimants receive medicals and the proportion is unchanged over the period shown. Increases in the medical component of claims costs have come from increases in the average amount of medical costs.

Figure 4.6 – Average Award and Proportion Receiving - Plaintiff Legal Costs in NSW

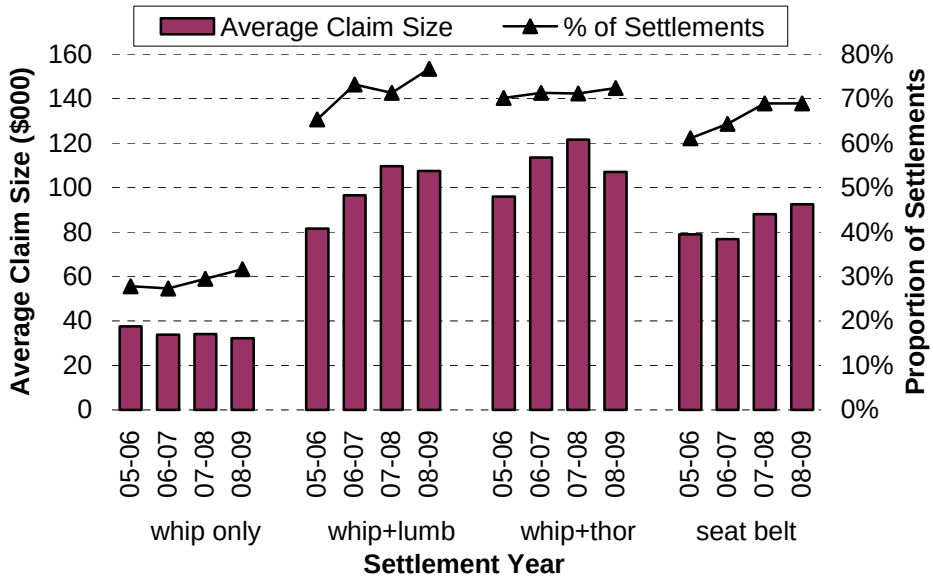


For plaintiff legal costs, the proportion receiving is largely unchanged. Increases in plaintiff legal costs have come from increases in the average amount per claim.

Legal involvement

I have examined the trend in average claim size separately for legally represented claims and direct claims. The proportion of settlements is also shown.

Figure 4.7 – Average Size and Proportion of Settlements – Represented Claims in NSW

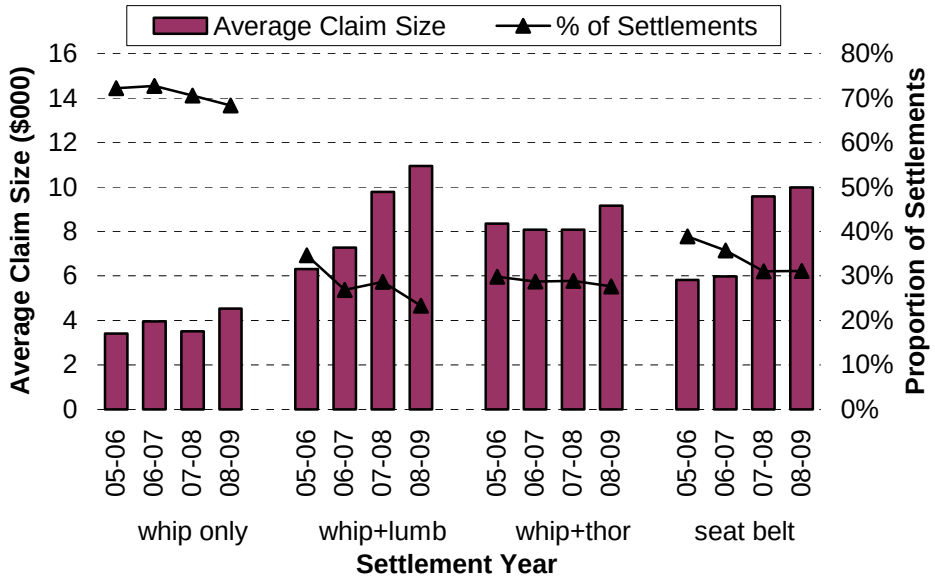


Around 30% of whiplash only claims and around 70% of claims from the three other injuries have legal representation. The proportion of all settlements that are legally represented has increased over the period shown.

Aside from whiplash only claims, the average size of represented claims increased over the first three years shown. Settlements in 2008/09 were at the same or lower average claim size as 2007/08.

For whiplash only claims, the average claim size has reduced.

Figure 4.8 – Average Claim Size and Proportion of Settlements – Direct Claims in NSW



Some increase in the average size of direct claims over this period is evident.

Summary

The above analysis indicated that superimposed inflation has been present in these claim types driven by –

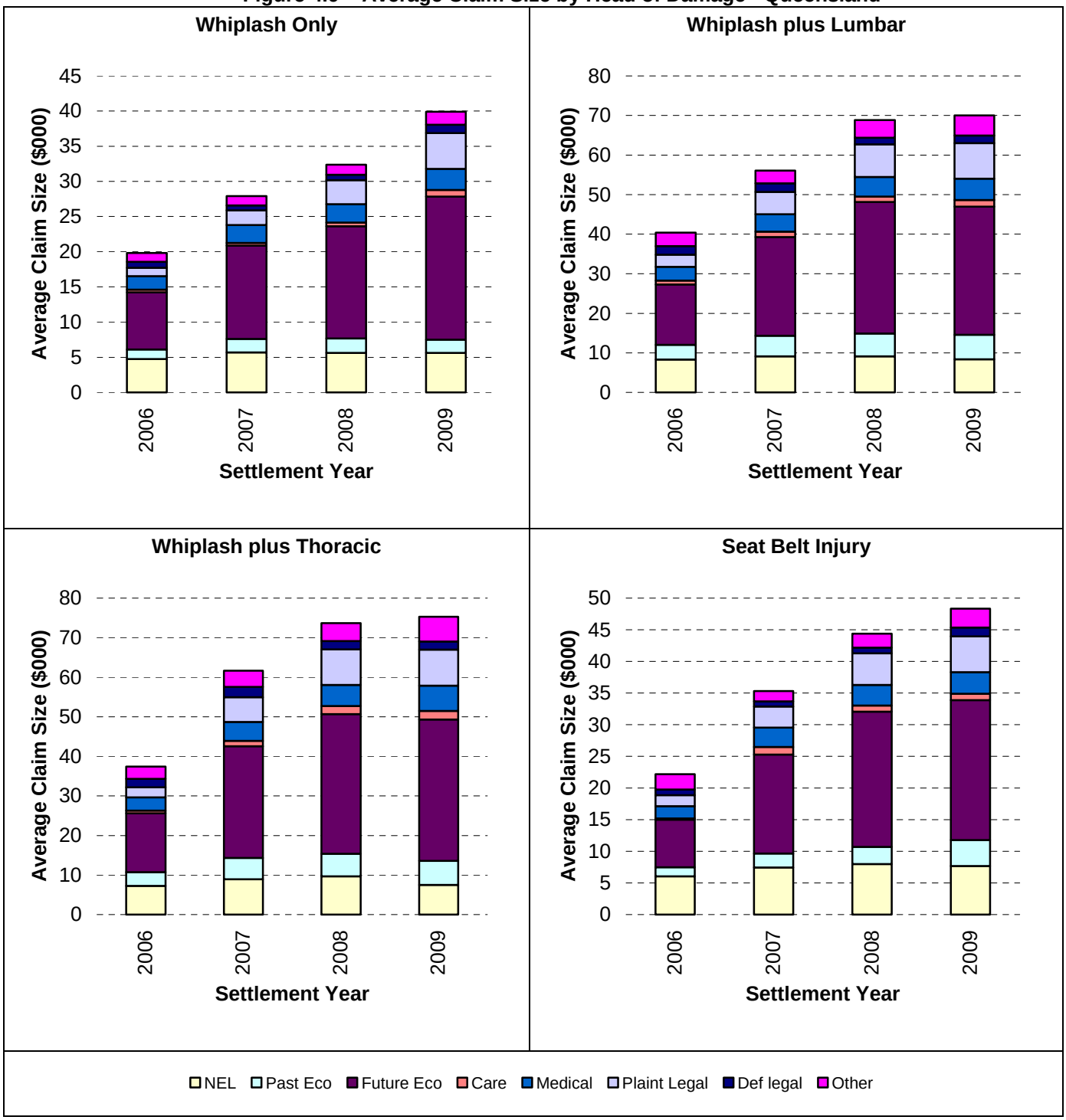
- Increasing proportions of claimants receiving FEL and Care
- Increasing average awards for medicals and plaintiff legal costs
- Increasing proportions of claims with legal representation.

4.4 Queensland

Average Claim Size by Head of Damage

The following graphs show the average claim size by settlement year for the four injury groups broken down by head of damage (claims settled within four years of accident date only).

Figure 4.9 – Average Claim Size by Head of Damage - Queensland



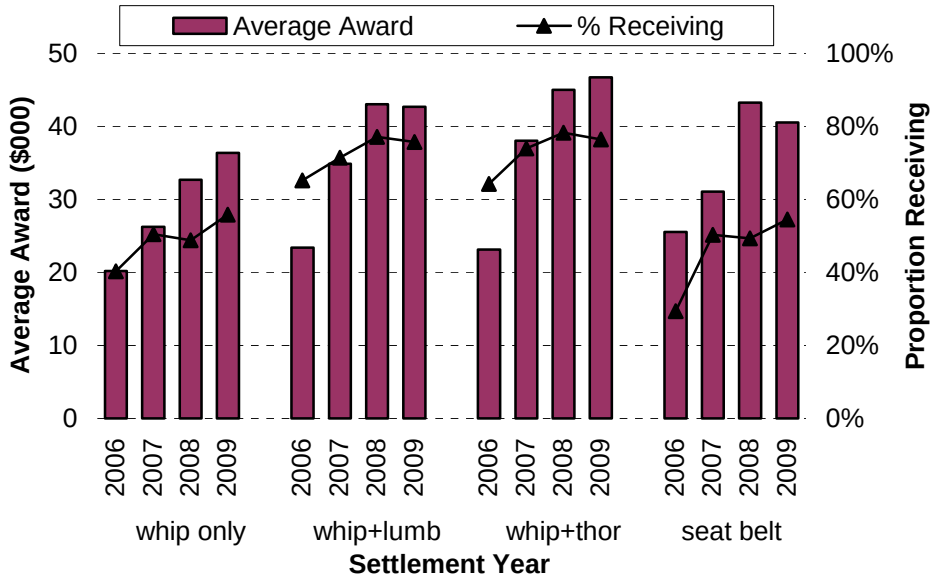
Each of the four featured injuries shows a similar trend of increasing average claim size over the period.

Consistent with our findings when we measured superimposed inflation across the scheme as a whole (as shown in section 3.2), the vast majority of the increase has come from future economic loss. There are also increases in past economic loss, general damages and plaintiff legal costs.

Detail by Head of Damage

For FEL, PEL, general damages and plaintiff legal costs, I have examined the average award (for those receiving the head of damage) and the proportion receiving the head of damage.

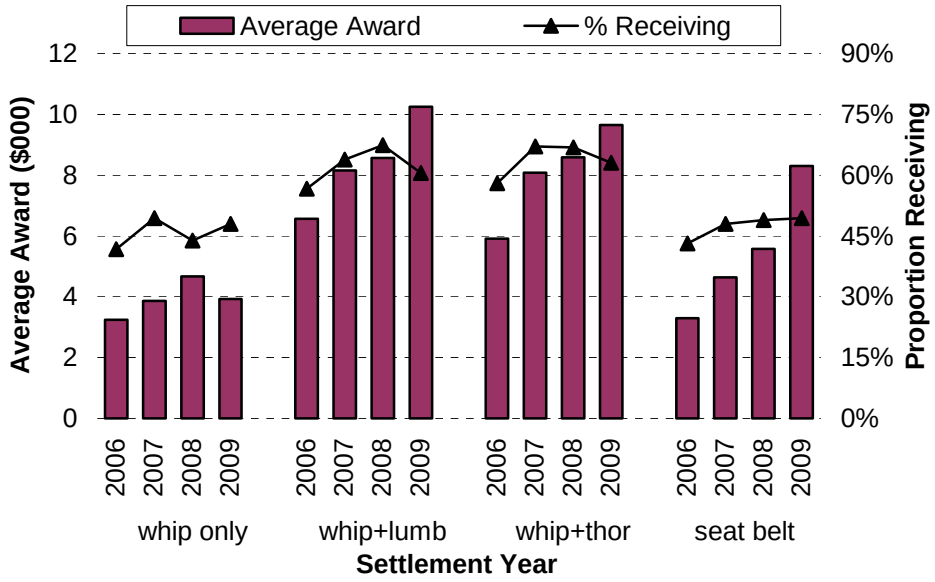
Figure 4.10 – Average Award and Proportion Receiving – FEL in Queensland



Increases in the FEL component of claims costs for these injuries has come from two sources –

- the average award for those receiving FEL has increased. There were significant increases in 2007 and 2008, with some levelling off evident in 2009.
- The proportion of claimants receiving an FEL award has also increased. The majority of the increase occurred in the 2007 year.

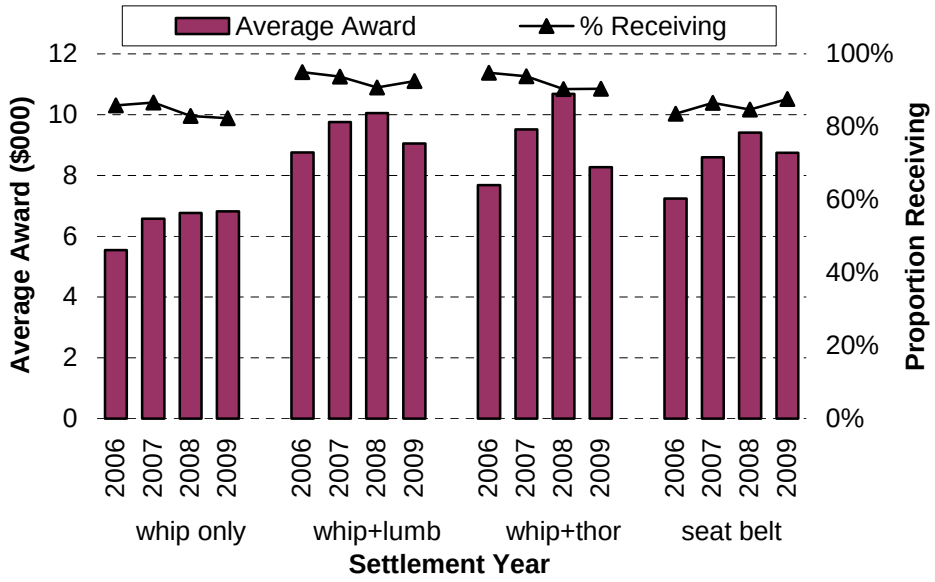
Figure 4.11 – Average Award and Proportion Receiving – PEL in Queensland



As for FEL, the average award for PEL increased significantly in 2007. Lesser increases are observed for 2008. The stabilisation evident in FEL awards in 2009 is not evident in PEL – awards have continued to increase for all injuries shown except whiplash.

The proportion of claimants receiving PEL increased between 2006 and 2007 and has been reasonably stable since.

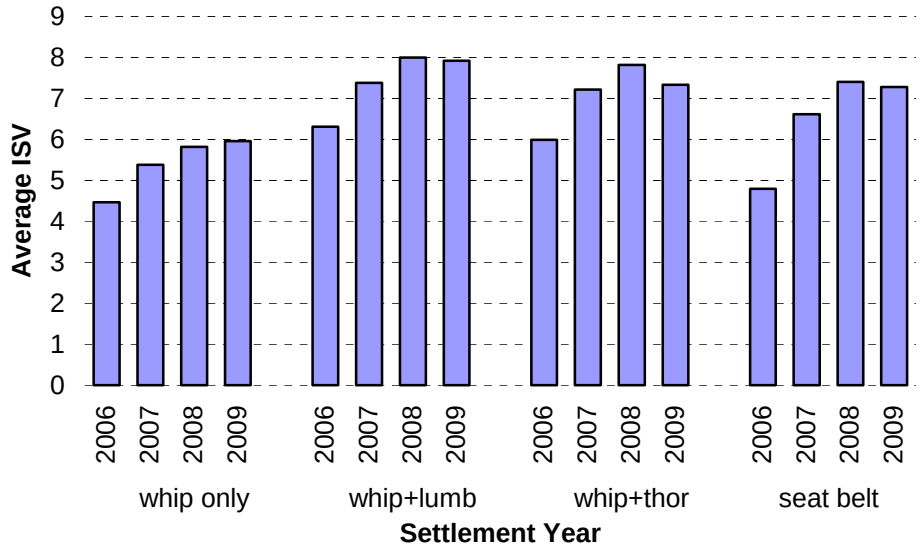
Figure 4.12 – Average Award and Proportion Receiving – General Damages in Queensland



The proportion of claims receiving general damages has fallen a little over the period examined for all but seat belt injuries. However, the average award increased significantly between 2006 and 2007, with a lesser increase in 2008. Reductions in the average award are evident in 2009.

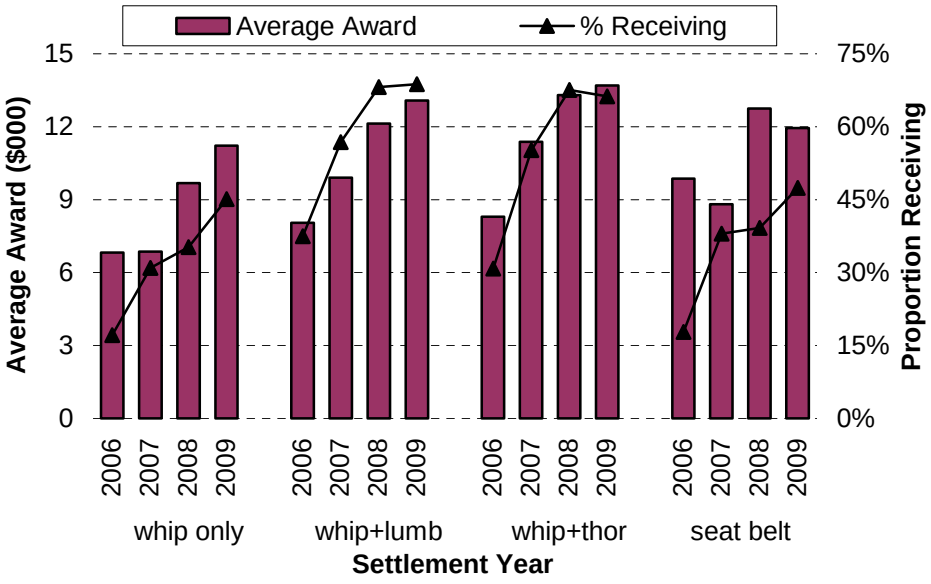
For general damages, we can also examine the ISV of the *dominant injury;* Figure 4.13 shows the average ISV for the four injuries examined for those claims that received a general damages award. There is not quite a 1:1 correlation with the general damages awards as the awards will also reflect any uplift for *multiple injuries* as well as contributory negligence. (Unfortunately, we do not have any information on ISV *uplift for multiple injuries* on the claims data we receive.)

Figure 4.13 – Average ISV of Dominant Injury



There were significant increases in the average ISV in 2007 and 2008, with 2009 similar to 2008.

Figure 4.14 – Average Award and Proportion Receiving - Plaintiff Legal Costs in Qld



For plaintiff legal costs, both the proportion receiving and the average award have increased significantly. This is likely to be the result of the legal cost thresholds in place in Queensland. (For accidents after 1 October 2000, no legal costs can be awarded unless

damages exceed $30,000; a maximum of $2,500 of plaintiff legal costs is recoverable for awards of between $30,000 and $50,000; full recovery is only possible if damages exceed $50,000.)

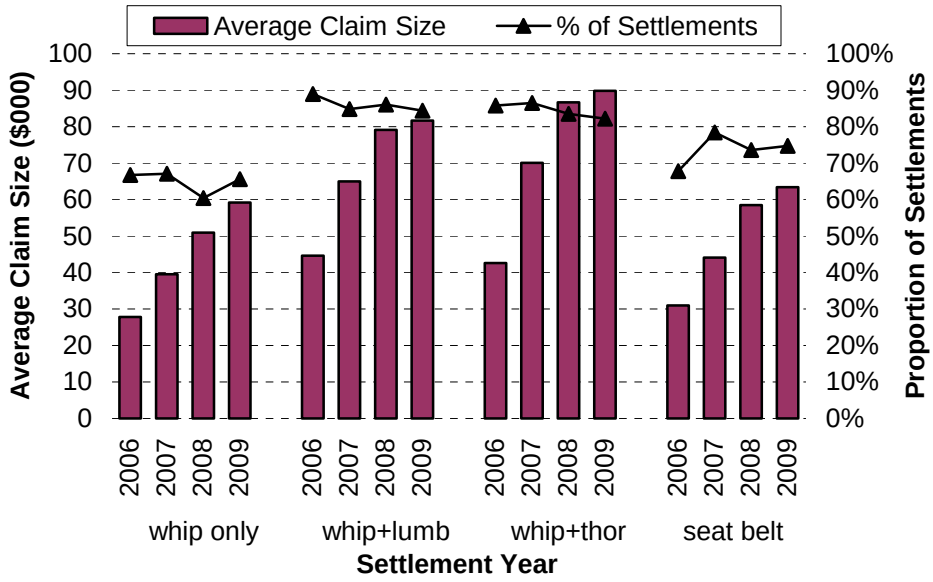
I have examined both the proportions receiving and average amount of plaintiff legal costs for these claims broken down by claim size band and conclude –

- The increasing proportion of claims with plaintiff legal costs reflects a larger proportion of claims exceeding the $30,000 threshold, thus qualifying for at least some recovery of plaintiff legal costs
- the increased average amount of plaintiff legal costs per claim reflects a higher proportion of claimants exceeding the $50,000 threshold, moving from nil/partial recovery to full recovery.

Legal involvement

I have examined the trend in average claim size separately for legally represented claims and direct claims. The proportion of settlements is also shown.

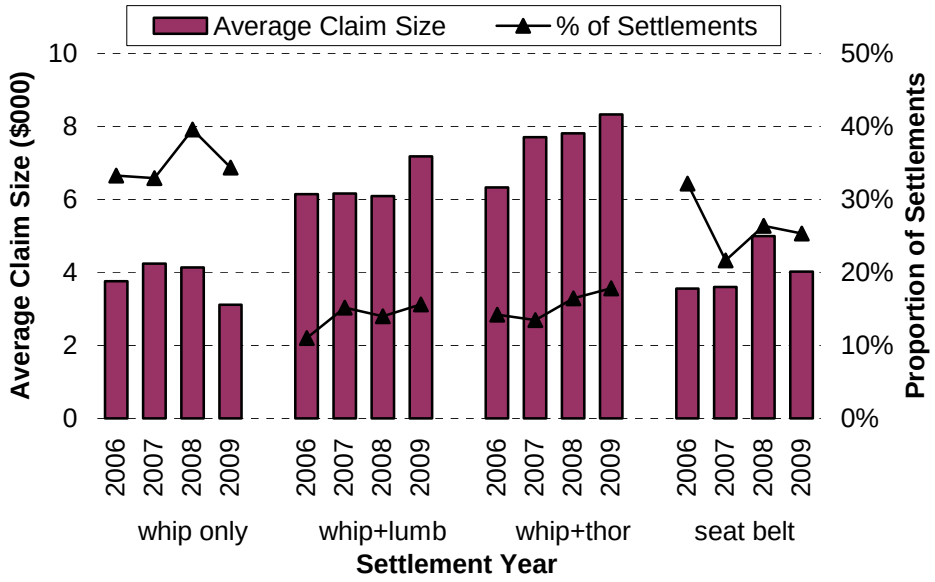
Figure 4.15 – Average Size and Proportion of Settlements – Represented Claims in Qld



Around 65% of whiplash only claims, 85% of whiplash plus claims and 75% of seat belt injury claims have legal representation. The proportion of all settlements that these claims make up has been reasonably stable.

The average claim size increased significantly in 2007 and 2008 with lesser increases in 2009.

Figure 4.16 – Average Claim Size and Proportion of Settlements – Direct Claims in Qld



There is less indication of superimposed inflation in direct claims compared with legally represented claims.

Summary

The above analysis indicates that superimposed inflation has been present in these claim types driven by –

- Increases in the proportion of claimants receiving FEL and the average FEL awards
- Similar increases in both proportions and amounts of PEL and plaintiff legal costs, but with a lower monetary impact
- Increases in the average awards for general damages, partially driven by increases in the ISV of the dominant injury
- The impacts are mainly in legally represented claims.

4.5 Further comments

The analysis presented in this section is illustrative of the type of analysis that can be constructed. Further detail could be considered for –

- Other injuries of sufficient volume – in NSW, both contusions (AIS85 codes 102011 and 102021) and abrasions (AIS85 codes 101011 and 101021) make up significant volumes of claims (9% and 6% respectively). I compiled the analysis for these injuries and they showed similar trends to four injuries shown, hence for brevity I did not include the analysis here
- More detailed breakdowns by head of damage – I have examined the heads of damage at a reasonably high level. The data is available to further segment the claims costs if desired (e.g. in NSW, care could be analysed separately for past,

future and Griffiths v Kerkemeyer elements, medical costs can be similarly subdivided). However some care must be taken in breaking down information by head of damage since coding is only approximate and protocols may have changed over time.

5 Thoughts for further investigation

So far in this paper I have shown two tools that the actuary can use to identify and attempt to measure superimposed inflation.

- In Section 3, Tool 1 – a relatively sophisticated actuarial model – provides a measurement of superimposed inflation at a scheme-wide level for both the NSW and Queensland CTP schemes over the period since the introduction of the MACA and the CLA
- In Section 4, Tool 2 – a comparable claims model - drilled down further in to the drivers of the measured superimposed inflation in certain low injury severity claims.

In this section, I speculate as to the reasons for the superimposed inflation observed in Sections 3 and 4 and discuss what further analysis techniques may be applied to assist with possible responses to superimposed inflation.

5.1 Possible Reasons for Superimposed Inflation – NSW

The factors outlined in the following paragraphs may have contributed to superimposed inflation in the NSW CTP scheme.

Use of Buffers

MACA introduced a 10% whole person impairment threshold for non-economic loss, reducing the level of benefits available to less severely injured claimants. There is anecdotal evidence that FEL and Care "buffers" have been used to offset to some extent the reduction in NEL benefits.

CARS Assessments

Decisions about quantum made at CARS may create settlement benchmarks. While the individual assessments are confidential between the parties, there are a number of factors that mean the decisions quickly filter through to insurers and plaintiff lawyers -

- The MAA publishes "cases of interest" in their MAAS Bulletin each quarter (de-indentified to protect the parties' privacy)
- The number of CARS assessors is reasonably small (around 40)
- CARS assessors fulfil multiple roles, working as either plaintiff and defendant solicitors as well as CARS assessors.

These factors in combination mean that any significant decision is likely to influence insurer and plaintiff solicitor behaviour in relation to other claims.

Improved preparation of cases by legal firms

A number of new plaintiff legal firms have appeared that specialise in handling CTP claims. As they deal with these types of cases all the time, their cases tend to be better prepared than perhaps they would have been in the past.

There has also been an increased use of occupational therapy experts (see comments relating to Queensland below).

Golden Eagle v Zhang

In 2007, the High Court upheld a decision that life expectancy tables used in calculating awards should be based on prospective life tables rather than historical life expectancy. As mortality is expected to improve, using prospective life tables will increase the multiples used in calculating amounts for future losses (e.g. future economic loss and future care), thus increasing the amounts of the awards.

5.2 Possible Reasons for Superimposed Inflation – Queensland

The factors outlined in the following paragraphs may have contributed to superimposed inflation in the Queensland CTP scheme.

The first court decision

The first court decision in respect of a CLA claim was a Queensland District Court case decided in March 2005 (Coop v Johnston). While this decision in itself did not create any new heads of damage, etc, it did indicate to both plaintiffs and defendants the benchmark against which settlements would be measured and also confirmed interpretation of some aspects of the CLA and its regulations, namely -

- ISV uplift for multiple injuries – the claimant had multiple injuries hence an ISV uplift to the dominant injury's ISV was warranted. The decision confirmed that the dominant injury was assessed as the injury with the highest ISV range (as per the regulations), even though for this claimant another injury (with a lower ISV) was more significant.
- Economic loss – the court awarded significant amounts for both past and future economic loss to the claimant who was unemployed at the date of accident. The award reflected the loss of chance of finding employment.

FEL Buffers

Section 55 of the CLA applies to awards for damages for economic loss that are unable to be precisely calculated by reference to a defined weekly loss. The objective of this section was to limit the judiciary's scope to make global awards for FEL. However, there have been several such cases, the first of which was Whitney v Whiteway, also in the Queensland District Court (decided on 12 May 2006).

The facts of Whitney v Whiteway were that the clamant had no past economic loss and was working full time. In addition, the claimant had furthered their qualifications since the accident, indicating that there had been no adverse effect of the injury on the claimant's employment prospects. As such, the defendant argued that there was no justification for a FEL component of the settlement. The court held otherwise, and awarded $60,000 for FEL.

Some members of the judiciary have been critical of the CLA, as the CLA over-rode the common law system that had been perceived to be working well for decades.

> *"the assessment of general damages, rarely a matter of great dispute between the parties or of particular complexity at common law…has been made difficult by legislative attempt to bring some consistency into this area"*[4]

General damages could not be awarded at pre-CLA levels due to the ISV scale, increasing the use of FEL buffers to offset at least partially the reduced GDs.

> *"It may be that general damages are a less significant part of the equation than they used to be, but after all, what really matters at the end of the day is the total amount of the judgment."*[5]

Use of Occupational Therapists

At around the same time as the Whitney decision, there was a significant increase in the use of occupational therapist reports which detailed any restrictions on the claimant as a result of the injury (for example, those with minor whiplash would not be able to lift more than 15kg). The reports generally drew a distinction between capacity to work and employability, arguing the case for FEL awards even if the claimant was employed i.e. if the claimant lost their job they would be disadvantaged in the open labour market.

Following Whitney, decisions began awarding significant amounts of FEL for those who were employed, even those in white collar jobs. While it was generally accepted that those in blue collar employment may not be able to work up until retirement age due to injuries suffered, this had not been the case for white collar workers.

Higher ISV Assessments

There are a number of areas where there is discretion in determining the ISV –

- the scale provides a range for a particular injury, hence depending on the severity of the dominant injury, the claimant may be assessed with a higher or lower ISV
- uplift for multiple injuries – the regulations state that the uplift "should rarely be more than 25%"[6], however uplift of greater than 25% is not precluded

[4] Judge White, from his judgement of Clark v Hall

[5] Judge McGill SC, "Assessment of ISV Under the Civil Liability Regulation" presented to Insurance Law Intensive 2007

- the courts are allowed to "have regard to other matters"[7].

For the four injuries examined in Section 4, I have been able to measure increases in the average ISV for the dominant injury (see Figure 4.13).

Anecdotal evidence and case law suggests that the uplift for multiple injuries has also increased. In Carroll v Coomber (May 2006), Judge McGill considered a 25% uplift to be insufficient due to the cumulative effects of three equally dominant injuries, and allowed an 80% uplift. In a speech, Judge McGill noted that *"the proposition that assessments will be rarely more than (25% uplift) was wishful thinking….. It would be unrealistic to assume that the 25% limit on uplift will not be exceeded, particularly for injuries to the spine."*[8]

Legal Cost Thresholds

Another factor at play in the Queensland system is the legal costs thresholds. In an environment of escalating claims costs, plaintiff legal costs will increase as the proportion of awards exceeding $50,000 increases.

5.3 What next?

The actuarial and comparable claims models have both indicated the existence of superimposed inflation, the types of claims most impacted, and the heads of damage contributing most to the superimposed inflation. But what next?

A further type of investigation which I have found to be useful in answering this question is an individual claim file review.

The hypothesis to be tested will determine how the review should be structured. For example one question I have seen asked is –

> *"What changes have there been to claims management and how has this contributed to superimposed inflation? What changes could be made to claims management to reduce superimposed inflation?"*

In this case two samples of claims were drawn –

- the first sample was from a defined pool of claims settled in the preceding 6 months
- the second sample was from the same defined pool of claims settled in the same period two years previously.

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[6] Civil Liability Regulation 2003, Schedule 3, Section 4(3)(b)

[7] Civil Liability Regulation 2003, Schedule 3, Section 9

[8] Judge McGill SC, "Assessment of ISV Under the Civil Liability Regulation" presented to Insurance Law Intensive 2007

The defined pool covered only the types of claims where superimposed inflation had been observed by the actuarial model. The sample size was determined to be large enough such that conclusions for the sample could be reasonably expected to hold for the whole pool of claims.

A data collection form was designed to collect information about each claim reviewed. This information was reasonably extensive and included information about -

- The plaintiff evidence presented and whether the evidence was sufficient to support the allegations with respect to certain heads of damage
- The defendant evidence presented and whether this evidence was sufficient to support the defendant's position with respect to certain heads of damage
- Reliance by the defendant on the plaintiff evidence or its own evidence
- The history of offers and counter offers, including details for particular heads of damage
- The reasons for resolution and the claims manager's role in resolution.

The specific design of the data collection form is crucial to ensure that the right information is captured to enable analysis to be undertaken and conclusions drawn.

The claim file review was conducted by suitably qualified claims personnel. After a trial number of reviews, claims were swapped between reviewers to ensure consistency in how the review was being undertaken.

The results of the file review identified changes to the behaviour of both plaintiffs and the defendant over the time period examined which had contributed to the superimposed inflation observed. Results were presented and discussed with the claims management team and were able to be used to identify actions and strategies aimed at reducing superimposed inflation.

A similar file review could be conducted subsequent to the implementation of the strategies to assess whether the actions had been implemented effectively.

There are clearly many different ways that a claim review could be structured. The important elements in my view are –

- Clearly defined questions to examine or hypotheses to test
- A well structured sample so that conclusions can be drawn about a wider range of claims and possibly across time
- A well designed data collection form
- Suitably qualified, independent reviewers
- Testing process to ensure consistency between reviewers
- Thorough analysis of data collected and clear presentation of results.

6 Conclusion

Superimposed inflation is, and will remain, a difficult aspect of actuarial work and scheme management. It is important for all stakeholders that –

1. the measurement of superimposed inflation is approached by actuaries in a rigorous manner, but that the results of the highly technical modelling are not overly relied on in terms of quantum
2. the sources of any superimposed inflation and the reasons for it are well understood. It is only then that stakeholders can make the appropriate response, whether that be –
   (a) inclusion of a suitable assumption in pricing or valuation bases
   (b) input into claims management practices of insurers to ensure that appropriate levels of compensation are paid to injured persons
   (c) possible changes to scheme design, to ensure that the design itself is not contributing to superimposed inflation.

This paper has provided an outline of some of the tools available to actuaries to assist in looking at this problem. In my experience, the use of a variety of different tools provides the best outcome in terms of identifying and reacting to superimposed inflation. I would generally suggest the use of –

- a relatively simple comparable claims model to monitor emerging settlement outcomes on potentially "problem" claims on a regular basis, i.e. quarterly or six monthly
- a more complicated actuarial model of scheme wide superimposed inflation which attempts to take into account as many factors as possible, including changes in the order of finalisation, undertaken at least annually
- individual claim reviews to examine more complex questions regarding the causes of and contributors to superimposed inflation and to assist in directing remedial actions.

Part II Appendices

A Actuarial Modelling Approach

As discussed in Section 2, the usual comparison of the average settlement size curves by operational time between various settlement years is not appropriate for both NSW and Queensland CT schemes, due to:

1. Falling claim frequency and the resultant impact on claims mix
2. Changes in the order of finalisation.

Either of these issues can invalidate the comparison of claim sizes at the same OTI to deduce the superimposed inflation pattern. Our analysis attempts to quantify differences in the size of settlements after normalising for these two issues.

The claims mix issue is dealt with by adopting a common claim profile for all accident periods. A benchmark accident year is chosen, being the most developed year with a similar frequency mix to more recent years ("claims mix benchmark year"). We chose the 2007 accident year as the benchmark claim mix while for both NSW and Queensland.

The changing finalisation pattern issue is dealt with by predicting the finalisation pattern for each of the accident years assuming the claims came from the 2000 accident year (NSW) and the 2003 accident year (Queensland) ("operational time benchmark year"). Forcing the order of finalisation to be more consistent between various accident years makes comparisons across OT more appropriate.

A.1 Claims Mix

Bootstrapping has been used to force claims from various accident years to have the same claims profile. The claim profile was examined by segmenting the data using various claims characteristics. The variables of interest included (but are not limited to):

- Legal Representation
- Rehabilitation Flag, and
- Injury Severity.

Dynamic variables pose an issue for this approach. Since most of the claims characteristics are dynamic (i.e. they change throughout the life of the claim), sampling based on the latest claim characteristics will be biased. To alleviate this problem, sampling of the claim characteristics was done at two quarters after the date of the accident. This makes the bootstrapping process less biased, and provides a more credible set of claim characteristics. However, claims that occurred in the most recent two quarters cannot be used for the bootstrapping process and changes in the way or speed in which insurers' information is captured introduces uncertainty in the results.
Analysis of the profile of the claims has been undertaken to determine how the claim characteristics have changed. Using these characteristics, "segments" of claims are

created. Then, based on the number of claims in each of the segments from the claims mix benchmark accident year, claims are randomly drawn from the other accident years (using a simulation approach) to match the claims mix benchmark accident year profile. The simulation algorithm randomly samples claims from each segment for each accident year until there are the same numbers of claims in each segment as the claims mix benchmark accident year.

A.2 Operational Time Ordering

The projection of claims finalisation pattern from the operational time benchmark year was carried out using a data mining technique known as boosting. This algorithm attempts to build up a complex prediction model from many simpler models. This is based on the principle that many weak "learners" can out-perform one single complicated "learner".

The operational times of the operational time benchmark year have been used as the inputs to the prediction model, which "learns" how claims from the operational time benchmark year have finalised based on their claim characteristics.

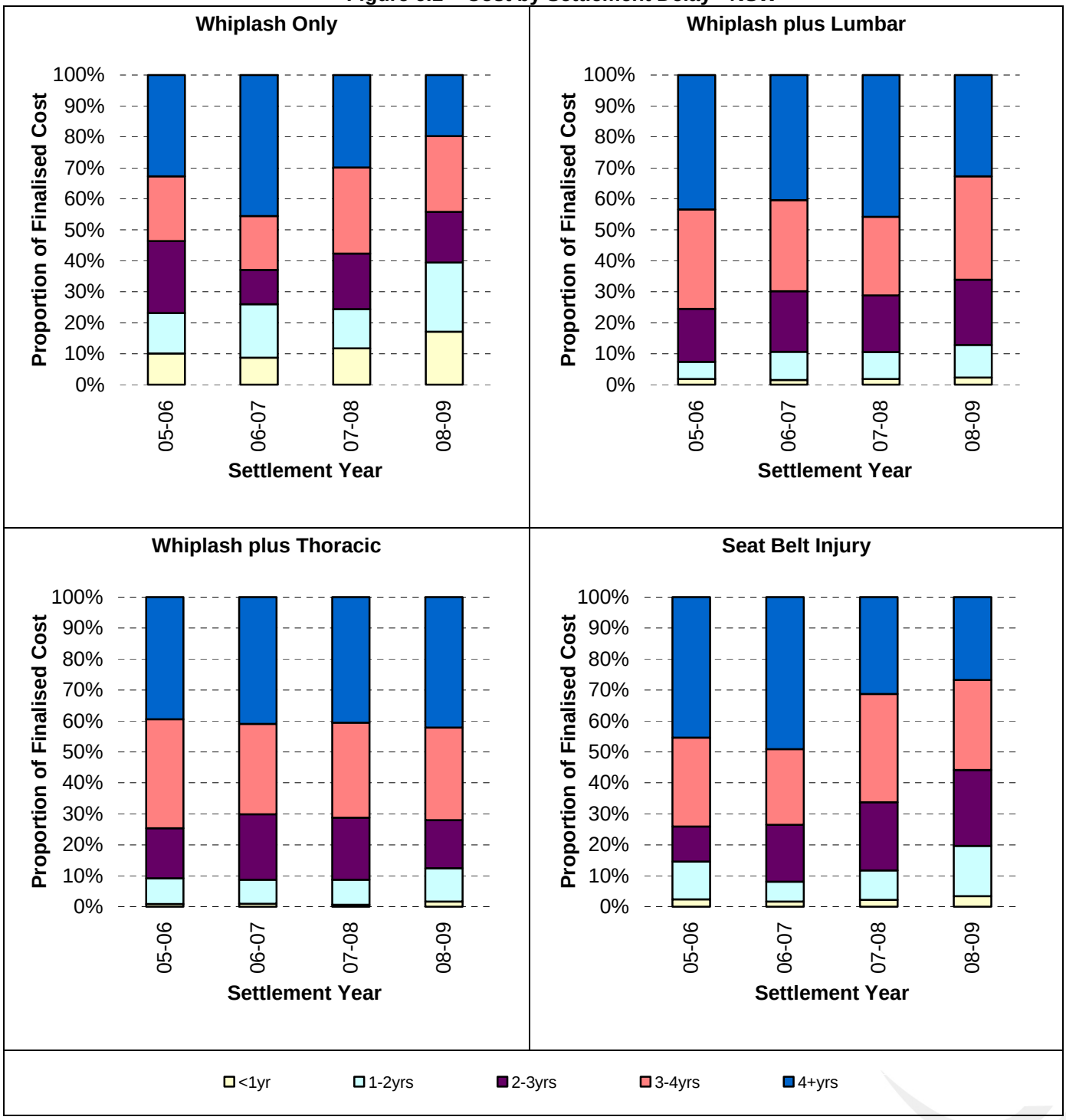
All claims are "scored" with this model and have a predicted OT as if the claims were finalised similarly to the operational time benchmark year.

The modelling is implemented in SAS Enterprise Miner with the Gradient Boosting function.

B Claims Costs by Settlement Delay

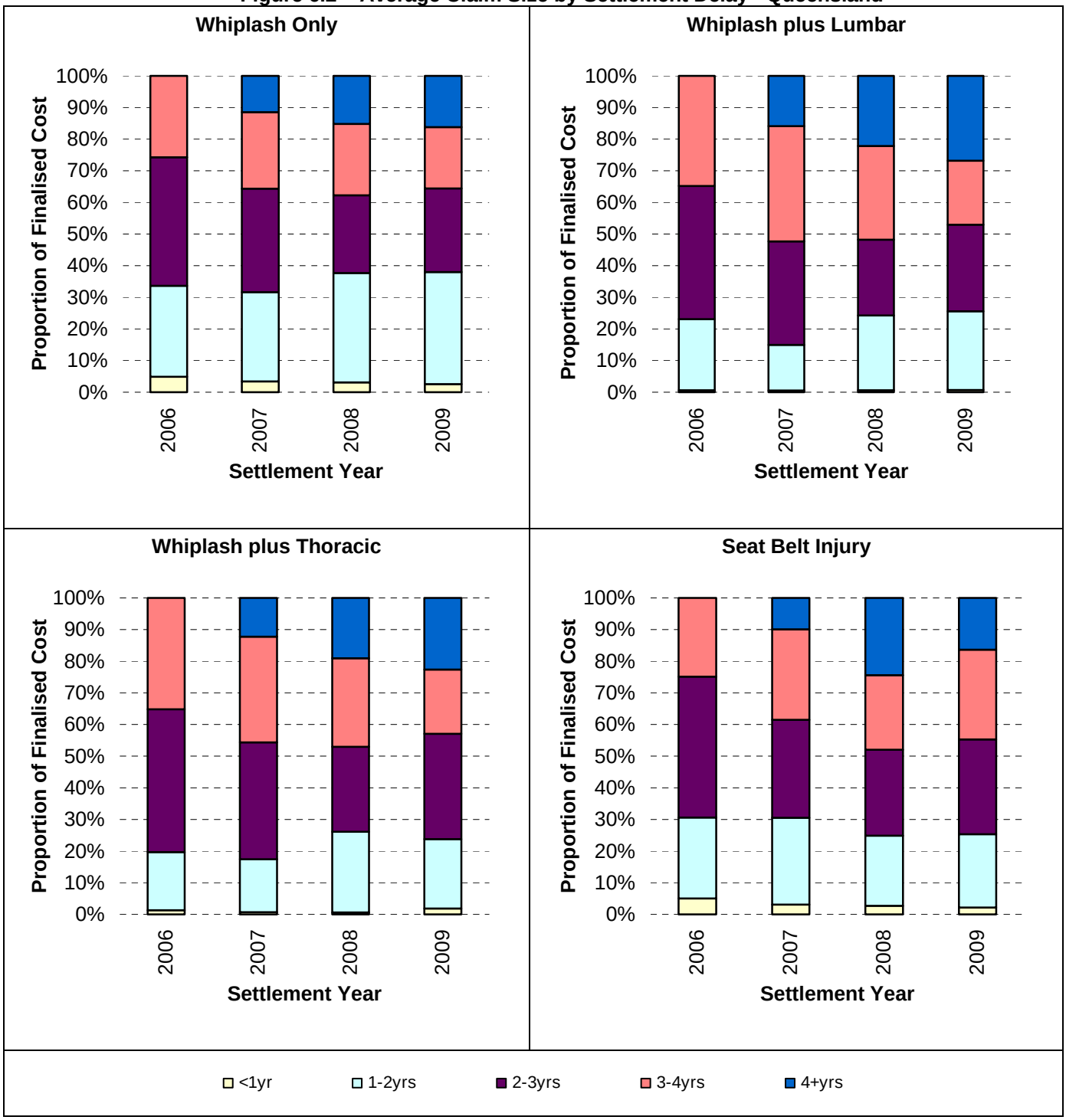
The following graphs show the proportion of finalised cost in each settlement year broken down by delay to settlement (number of years between accident and settlement). I have examined the information in this way to see if there is any bias in the analysis presented in Section 4 that may result from the NSW and Queensland schemes still maturing (thus having an increasing proportion of costs in the 4+ settlement delay).

Figure 6.1 – Cost by Settlement Delay - NSW



For NSW, the proportions of cost in each delay band are similar for each settlement year for each injury shown.

Figure 6.2 – Average Claim Size by Settlement Delay - Queensland



For Queensland, maturing of the scheme is still evident, with an increasing proportion of costs in the 4+ years delay. As such, for the Queensland analysis included in Section 4 I have excluded all claims with settlement delays of more than 4 years.