The Gold Standard & Maturity Framework*

Measurement of the property-casualty actuarial reserving process
September 2007
Introduction

Pursuant to the Sarbanes-Oxley Act of 2002, publicly-held property and casualty insurance companies are required to have processes and controls surrounding their actuarial reserving process – the estimating and recording of unpaid losses and loss expenses. US statutory reporting will likely have a similar requirement in the near future. Over the past several years, some companies have taken great strides toward establishing a well-controlled environment, while others have elected to establish the minimum level of controls to accomplish the requirements for management’s Section 302 and Section 404 certifications and receive an unqualified audit opinion.

There are significant advantages to insurers for having a strong control environment and a “best practices” reserving process. Loss reserves are the largest liability and the most volatile item on a property/casualty insurance company’s balance sheet. Therefore, a reserving process functioning at an optimal level has strong internal controls with few or no deficiencies, reduced risk of reserve misstatement, high-quality documentation of the actuarial analysis and appropriate management support for the recorded amounts. These factors result in a more effective and efficient external audit, as well as a significantly reduced likelihood of issues arising from the audit of the recorded amounts or testing of internal controls. The benefits go beyond financial reporting, as a strong control environment allows senior management and the audit committee to make better informed company decisions on underwriting, capital allocation and other business decisions. Although some companies have a general sense of opportunities to improve upon current practices, few companies have systematically studied the whole actuarial reserving process to honestly assess current practices in relation to an ideal, best-practices reserving process, i.e., the Gold Standard.¹

What is the Gold Standard when it comes to P/C reserving?

At PwC, we have experience dealing with many types of companies, including large multinational insurance and reinsurance companies. Based on our experiences with these companies and the information we recently gathered from companies regarding corporate governance of the loss reserving process, we have developed a set of key principles of the reserving process. We have also described a continuum of practice that could be helpful to measure a company’s maturity relative to each of these key elements. We have considered these key elements consistent with a best-practices reserving model. For the most part, for each of the key elements described, the Gold Standard is consistent in principle with the actual practice we have observed at one or more companies that operate at or near an optimal level. However, for certain elements of the reserving process, we are unaware of companies operating at a gold-standard level. Consequently, we developed what we believe, based on our collective judgment and the overarching goal of having a reserving process operate optimally, a Gold Standard might be from a financial reporting perspective.

While the Gold Standard described in this document is based upon observed or desired practice for larger insurance and reinsurance companies, the principles involved and the continuum described also apply to smaller insurers and many self-insurers. By using the Maturity Framework, smaller insurers and self-insurers can identify opportunities to improve their current processes and practices.

¹ The Gold Standard and Maturity Framework described in this document is not designed to be an assessment of controls and/or a template for controls testing under an integrated audit.
Using the Gold Standard Maturity Framework

Performing an honest and objective assessment of the company’s reserving process and communicating the result of this assessment to management and the audit committee are simply the first steps of using the gold-standard tool. Ultimately, a company should use this tool to identify specific opportunities to improve current processes and then develop appropriate action plans to achieve its goals. This document describes the Gold Standard and can be used by a company along with an AIMS specialist to determine where a company stands on a continuum of practice. In addition, PwC, as a reviewer of many companies, can provide input on where a company stands not only to the ideal but also to its peers.

Suggested path forward

To use this tool, we suggest following this approach:

• Develop an understanding of the Gold Standard and Maturity Framework by reading this document; an AIMS specialist would be available to assist by answering questions and/or providing a brief presentation.

• Identify the reserving processes to be evaluated and compare them to the Gold Standard. For many large, multinational property and casualty insurance companies, there is likely a separate process for each GAAP reporting segment and, in a few instances there might be multiple processes within a segment. Each individual reserving process should be evaluated and compared to the Gold Standard separately.

• An AIMS specialist, working closely with key management resources, would complete the Maturity Framework in Section 3 considering the description of the Gold Standard from Section 1 and the Maturity Framework from Section 2. We have developed detailed illustrations of each stage of maturity for each element of the reserving process to guide our assessment.

• Once the maturity evaluation table is completed, a brainstorming session—led by the AIMS specialist and including key members of management, such as the chief actuary, lead reserving actuary and CFO – could be held to determine how a company can improve and the most feasible ways for a given company to establish a plan to move up the maturity continuum. In addition, there would be additional possibilities as to next steps:
  — An exchange of views with actuarial department management
  — An exchange of views with non-actuarial management
  — Discussion with and/or presentation to the audit committee

• At future points, perhaps annually, the maturity evaluation table should be completed to assess results, measure progress and develop an updated approach depending on the results.
Gold Standard—The key elements

For purposes of describing a Gold Standard, we have organized our description of best practices and assessment of a loss reserving process into eight components:

1. Management and board involvement
2. Actuarial staffing and expertise
3. Data quality and reliability
4. General reserving approach (frequency of reviews, level of detail, gross vs. net, etc.)
5. Reserving methodology
6. Documentation of reserving process
7. Use of external actuaries
8. Financial statement disclosures

A summarized description of each of these key elements is contained in this section. The following section of this document provides a guide to use when analyzing each company’s position in each of these areas.

1. Management and board’s involvement

Gold-standard companies have senior management and audit committees that are strongly committed to the financial reporting and loss reserving processes. Management’s commitment is demonstrated by prioritizing and committing necessary resources (e.g., staffing, computer systems, etc.) to the reserving process; minimizing potential conflicts of interest; understanding the reserving approaches, methods and key assumptions; challenging these as warranted; and proactively monitoring changes in reserve estimates on a regular basis through internal management reporting. The audit committee actively oversees the reserve-setting process by monitoring and evaluating the policies and principles surrounding reserve setting, the internal controls around reserves and the effectiveness of related disclosures. In this oversight role, the audit committee meets regularly with internal actuaries, external actuaries and the external auditors.

2. Actuarial staffing and expertise

With regard to the internal actuarial function, gold-standard companies have the following qualities:

- Appropriately credentialed professionals (e.g., members of the Casualty Actuarial Society and American Academy of Actuaries) adhere to continuing education requirements. The actuarial staff is encouraged to participate in relevant professional meetings and seminars, and a program supporting professional advancement (e.g., actuarial student program) exists.

- Staffing levels are of sufficient quantity and quality to allow for comprehensive, timely review of the relevant reserving components, and duties are segregated such that separate individuals are responsible for the primary analysis function, technical review and supervisor peer review.
Reserving personnel are independent of those responsible for underwriting and pricing the business; nevertheless, the reserving process takes account of key metrics evaluated in the pricing department (e.g., pricing or rate monitor, expected loss ratios, etc.).

The chief actuary takes ownership and is individually responsible for the internal actuarial estimate for all reserves, even difficult-to-estimate liabilities such as those from asbestos and environmental claims. The lead actuary compiles appropriate summary schedules (e.g., reserves by grouping, loss-ratio analytics, IBNR/case, runoff/accuracy of prior estimates, etc.) into an internal actuarial package to be presented to a reserving committee.

The chief actuary presents the internal actuarial package to a reserving committee or the equivalent management group on a quarterly basis or more frequently. Such a committee includes key members of senior management in the company, and it is collectively responsible for determining reserve levels. The conclusions are then documented and executed—see section on Documentation of Reserving Process below.

Inefficiencies from staffing turnover in the actuarial department are minimized by the well organized, executed and documented reserving process.

Loss, premium and other actuarial data are usable for estimation purposes as they are captured and contained in the company’s systems; this allows for straightforward and relatively easy reconciliation to the actuarial data and from the actuarial analysis to information published in financial statements.

Computer systems are capable of capturing data in the sufficient quality and detail needed for actuarial review. While highly complex and/or unusual claims and/or coverages present a greater challenge in this regard, the difficulty in estimating liabilities for such claims makes this capability that much more important.

Manual processing, which is subject to backlogs and higher error rates, is minimal or nonexistent. Where manual processing is necessary, adequately documented and controlled procedures are in place to ensure timeliness, accuracy and completeness.

The data for actuarial analysis are available in a timely manner for actuarial review and management consideration in the current period’s financial results.

MGA and TPA interfaces are well controlled and regularly monitored to ensure that data is properly incorporated into the actuarial review process.

As needed, computer systems permit functional currencies to be accurately recorded and translated at historical or constant exchange rates, as appropriate, for aggregation with other data for actuarial analysis.

In summary, a company following the Gold Standard has system-generated data directly usable in the actuarial estimation process, and such data is captured in the detail necessary for an actuary to apply a wide variety of actuarial methods.
4. General reserving approach

The general reserving approach can involve a number of issues such as the frequency of reviews, gross/ceded/net analyses, reasonableness checks and the use of software.

With regard to frequency of actuarial evaluation, there are several key themes of gold-standard companies:

- For SEC registrants, the reserve evaluation process is performed and finalized quarterly, consistent with public reporting requirements, in a timely manner before final decisions are made as to reserve and other reported amounts.

- For traditional claims (i.e., those which lend themselves to common actuarial methods), full reviews are completed each quarter using data evaluated as of the quarter-ending date (i.e., not on a quarterly lag). In cases where the size and/or complexity of the amounts prohibit a comprehensive review in this time frame, then reserve reviews are completed with one quarter lag. Such reviews are coupled with a rigorous actual-versus-expected analysis for the most recent quarter.

- For nontraditional claims, such as asbestos, pollution or directors and officers coverages, full reviews are completed once per year, with key monitoring statistics considered during the quarterly reporting process.

Gold-standard companies have the same rigor of analyses for the reserves prepared gross of reinsurance as they do on a net of reinsurance basis. Further, gross and net analyses, or another combination such as gross and ceded analyses, are prepared concurrently and the results compared to one another for reasonableness. The impact of other financial statement items with associated actuarially determined amounts such as reinsurance recoverables, adjustable ceding commissions and additional premiums are also considered at this point in the process.

Where a portion of reserves are discounted for time value of money, the key approaches and assumptions used to calculate such discounted amounts are consistent with the actuarial analysis underlying the selection of the ultimate undiscounted amounts.

Standard outputs from the reserving estimation process include reasonability checks and analytical or diagnostic metrics, some of which are “traditional” to actuarial work, while others may be popular in financial reporting or investor analyst research. Typical actuarial analytics may include ranges, changes in ultimate losses between analyses, evaluation of loss-ratio trends, IBNR-to-case ratios, etc.

Gold-standard companies use internally or externally developed reserving software for the reserve estimation process. Such software is well controlled and typically contains sufficient flexibility to allow users to apply the best methods for an applicable circumstance. Ad hoc calculation spreadsheets are rare exceptions, but are used, with appropriate end-user controls, when the flexibility of such a tool is necessary to improve the accuracy of the estimates. Further, systems facilitate the actuary’s documentation of their considerations for assumptions or judgments that deviate from a guideline. Manual hand-offs/transfers (e.g., “copy, paste, value”) are negligible to the process.
5. Reserving methodology

A reserve analysis should be based upon well-established reserving principles as set forth in the Casualty Actuarial Society’s Loss Reserving Principles standard. Typically, use of a variety of methods will produce better estimates and provide more insight into the risks being evaluated.

A gold-standard reserving process uses the best methods available for the circumstance, not just those that are the easiest to apply. Assumptions are vetted among claims, underwriting and actuarial management to ensure an appropriate level of exchange of approaches and viewpoints. Further, where multiple business units and/or multiple locations are involved, dedicated teams are built to form a broader or global approach to evaluating certain parameters of reserving models (e.g., tail factors, loss trends, positions taken on special claim complexes) or for global lines of insurance (e.g., D&O, catastrophe reinsurance, high excess clash covers, aviation, etc.). Finally, the reserving actuaries interact closely with underwriters and pricing actuaries to obtain appropriate price monitoring information as inputs into the reserve estimation process.

6. Documentation of reserving process

Gold-standard companies document their work in a manner that clearly leads from the data used in the actuarial analysis, which is reconciled to the financial records of the company through the compilation and decision-making process and, ultimately, to the amounts recorded in the financial statements. The documentation contains supporting analysis and calculations in sufficient detail for another actuary practicing in the area to follow, consistent with Actuarial Standard of Practice 41 (ASOP 41), Actuarial Communications. Additional documentation exists to demonstrate the execution and effectiveness of peer review and other controls.

Companies following the Gold Standard record their best estimate and appropriately document it as such. The recorded amount may or may not equal the internal actuarial indication (or third-party actuarial indication, if there is no internal actuarial indication). In circumstances where the recorded amount equals the actuarial indication, then a record is made by management actively supporting its view that the actuarial indication is the best estimate. In circumstances where the recorded amount does not equal the actuarial indication, then a record is made by management that qualitatively and quantitatively supports, as appropriate, why the recorded amount represents a better amount than the actuarial indication. Further, care is taken to ensure that the recorded amount is still considered to be a reasonable estimate by the internal actuaries.
7. Use of external actuaries

Gold-standard companies will engage third-party actuaries to perform corroborative analyses. Company management understands that the third party is typically independent and, therefore, generally considered more objective than company employees. In addition, third-party actuaries often bring unique information and/or expertise that are not otherwise available to company employees for unusual or nontraditional claims areas (e.g., asbestos).

Company management is engaged throughout the third-party review to understand the key methodologies and assumptions. Companies that do not utilize internal actuaries review the third-party indications, consider the results of the third-party report in the reserve setting process and document the resulting conclusions, even when no changes are made to recorded amounts. When companies utilize internal actuaries who engage a third party, the third-party indications are reviewed, meaningful differences between the internal and external indications are understood and documented, and management considers these differences in its reserve setting process with appropriate documentation regarding the conclusions reached.

The frequency and breadth of third-party analyses depends on the nature of the liabilities (i.e., long-tail versus short-tail), the perceived value of independence and the additional information and/or expertise that the third party can bring. Companies with more complex exposures have third-party reviews completed no less frequently than once per year. Appropriate controls exist over the data provided to the third party for analysis.

In addition, input and related advice are regularly sought from the external auditor’s actuaries, including but not limited to views on reserve adequacy, effectiveness of controls and ideas on how to improve efficiency and effectiveness of reporting.

8. Financial statement disclosures

Gold-standard companies continuously benchmark their financial statement and MD&A disclosures with the SEC’s evolving views on financial statement transparency. In particular, such companies provide clear and understandable disclosures regarding:

- The process management undertakes to estimate its reserves
- How management arrives at its best estimate and why that amount is better than other estimates
- Reserve ranges and/or other key metrics that provide transparency as to the uncertainty in the estimates, with adequate characterization of the range or metrics provided
- Presentations of accident-year data are consistent with the underlying actuarial analysis and management’s best estimates, regardless of whether the underlying data were analyzed on an accident-year, report-year, policy-year, underwriting-year or calendar-year basis.
- Explanations regarding the amounts and reasons for prior-period development, even if increases (or decreases) are offset with decreases (or increases) in other lines. Further, the amounts of development attributable to true claims development, premium development, accretion of discount or foreign exchange are determined, presented separately and appropriately characterized.
- Other information useful to individuals such as global loss triangles

With each of the above items, gold-standard companies have controls in place and documentation supporting their disclosures in the same amount of rigor as for the financial statement amounts for loss reserves.
Maturity framework

Insurance companies can be at various stages of development in the various categories of the Gold Standard. This section can be used to provide a “rating” from 1 (minimal) to 4 (optimal) for each of the eight categories described above. A brief description of each of these categories is below:

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<tbody>
<tr>
<td>General definition</td>
<td>Reserving process not well standardized, significant changes—sometimes it is smooth, timely and efficient, other times it is not; numerous gaps and shortcuts exist.</td>
<td>Reserving process is well standardized—generally smooth, efficient and timely; however, some gaps and shortcuts still exist.</td>
<td>Operating at the Gold Standard—a best-practices company.</td>
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<tr>
<td>Operating near or at the minimum level needed for management to complete their attestation (and an audit) in a timely manner.</td>
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Several points:

- A company operating at a level below the description of minimal would receive a rating of “0.”
- It might be difficult to assign a rating to some companies because they are at a higher level in some respects and at another level in others. In such cases, a suggestion would be to provide a rating in between the two levels (e.g., 2.5)

A table such as that in Section 3 could be used to compile the ratings along with the rationale for such ratings.

Once the maturity evaluation table is completed, a brainstorming session—led by the AIMS specialist and including key members of management such as the chief actuary, lead reserving actuary and CFO—could be held to determine how a company can improve and what the most feasible ways are for a given company to establish a plan to move up the maturity continuum. Other possibilities include:

- An exchange of views with actuarial department management
- An exchange of views with non-actuarial management
- Discussion with and/or presentation to the audit committee

At future points, perhaps annually, the maturity evaluation table should be completed to assess results, measure progress and develop an updated approach.
Maturity Framework form

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<tr>
<th>Category</th>
<th>Rating</th>
<th>Rationale for rating</th>
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<tr>
<td>Management’s role</td>
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<td>Actuarial staffing</td>
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<td>Data quality/reliability</td>
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<td>Financial</td>
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<tr>
<td>Statement disclosures</td>
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