

1. Executive Summary

The Tillinghast business of Towers Perrin was asked by the Casualty Actuarial Society to undertake a research project that analyzed the potential impact on the U.S. property and casualty insurance industry of converting from GAAP to fair value financial reporting. Fair value financial reporting has been an ongoing initiative by both the IASB and FASB. Specifically, we were asked to (i) examine the impact of this accounting change on a “typical” U.S. property and casualty insurer, (ii) identify the practical issues associated with the measurement of property and casualty insurance liabilities¹ on a fair value basis, and (iii) prepare a report that would help all parties to evaluate the extent to which fair value accounting meets its intended objectives of greater transparency, reliability and relevance than is achieved under current U.S. GAAP accounting. The Casualty Actuarial Society provided partial funding for our research.

Research Approach

To explore these issues, we constructed an historical database containing 11 years of published regulatory financial and actuarial data of a sample of insurance companies, for three major insurance products: Personal Auto Liability, Workers Compensation, and Medical Professional Liability. These products were chosen because they have distinctly different claim payment patterns and risk profiles. The financial data that we used are on a direct basis, prior to any reinsurance that the company may have purchased or sold. For each of the three products we restated the published direct regulatory results for each company over the 11-year period, ultimately producing *pro forma* financial statements for each product, company, and calendar year on both a current U.S. GAAP and a proposed fair value basis.

Sections 5.2 and 5.3 of the paper describe the data we used and the adjustments we made to convert the data from a regulatory to a U.S. GAAP basis. Since the regulatory data had some limitations, those sections also describe the assumptions that we made in the conversion process. Taken in the overall, we do not believe that these adjustments or assumptions are material to our overall conclusions.

Having developed a baseline set of GAAP financial data, we then sought to adjust that data, by restating the claim and defense cost liabilities to a fair value basis. Neither the IASB nor FASB have prescribed a specific approach for calculating the fair value of insurance liabilities. Thus, our charge was to design and test alternative *valuation methods* and report on the results, without opining on the appropriateness of any particular methods.

To convert the company financial statements to a fair value basis, we separately analyzed two key new elements required to convert the nominal values of claim and defense cost liabilities to fair value: the time value of money and market risk margins², observing how these two

¹ The FASB and IASB fair value projects have a long-term goal of valuing all financial assets and liabilities at fair value. The scope of the CAS-commissioned analysis was limited to understanding the impact of fair value accounting on property and casualty insurance claim and defense cost liabilities.

² In this paper we refer to this margin as a market risk margin; others refer to it as a market value margin.

elements vary by product, by company and over time³. We found that, depending on the relative magnitude of the two elements, the fair value of claim and defense cost liabilities could be lower or higher than their nominal value.

Our starting point was the *pro forma* GAAP claim and defense cost liabilities for each company group, product and annual statement date. We assumed that the reported amounts represent the best estimate of the nominal ultimate liabilities as of each financial statement date. Development of the adjustment for the time value of money required making assumptions as to the timing of expected future cash flows associated with the liabilities and making selections of appropriate interest rates. Traditional actuarial approaches were applied to each company group's data to develop the expected future cash flows. The cash flows were then discounted at risk-free rates based on yield curve data relating to U.S. Treasury securities.

While discounting for the time value of money and the use of U.S. Treasuries as a proxy for risk-free rates might seem relatively straightforward, there are a number of implementation issues in the context of fair value — all of which must be resolved prior to implementation. These issues are discussed in Section 5.4 of the paper. One issue is that the articulated fair value principles express a strong preference for “market-based” assumptions over “entity-specific” assumptions. A key question is therefore whether the expected pattern of future claim payments should be derived from entity-specific data, or by some other means. A second issue is the determination of the risk-free rate. While interest rates on government debt have generally been accepted as risk-free, a wide range of recent academic research is coming to the view that such rates are not the best proxy for risk-free rates.

For each of the insurance products, we also developed a market risk margin reflecting the additional amount that marketplace participants would demand as compensation for taking on the risk associated with the claim and defense cost liabilities. (Of necessity, this is a theoretical exercise, as there is no robust secondary market for such liabilities.) We calculated the market risk margins for each product, company, and statement date using a two step process: first we measured empirically the margins available in the market for pricing risk (i.e., the amount of risk that exists before the claims have occurred); then we measured the amount of reserve risk that remains once the claims have occurred and assumed that the market would demand the same margin per unit of risk in a reserving context as it did in a pricing context. To quantify the empirical pricing market risk margins, we analyzed the observable insurance pricing margins, based on the prices that insurers actually charged at the time the policies were sold. To measure the amount of risk associated with each company's claim and defense cost liabilities, we applied two alternative approaches: an analytic approach published by Mack and a stochastic simulation approach published by Hodes, Feldblum and Blumsohn.

In developing the market risk margin, there are also a number of implementation issues that must be resolved prior to implementation. The FASB and IASB have indicated that fair value estimates must include an element representing the premium that market participants would demand for risk, and that the risk premium must reflect real markets, including any imperfections in such markets. However, they have not defined risk mathematically or

³ We did not analyze the impact that an adjustment for the credit standing of the company would have on fair values (as some have proposed), as this element was outside the scope of the CAS-commissioned study.

prescribed how it should be measured. There is currently a wide divergence of opinion as to what risks should be included and how market risk margins should be determined. The main areas of disagreement are (a) the degree to which market imperfections exist, and therefore the degree to which they need to be reflected in fair value estimates; and (b) the definition of *systematic risk*, and how it should be measured and incorporated into fair value measures. Financial economists define systematic risk narrowly as equity market volatility, and argue that all other risks are diversifiable by investors, such that investors will not require a risk premium for those other risks. In their view, only risk that is correlated with equity market returns requires a risk premium. Others view equity market risk as one instance of systematic risk, with risk margins driven by a number of systematic elements: central bank monetary policy, interest rates, consumer price inflation rates, steel prices, energy prices, levels of economic activity, unemployment rates, government fiscal policy, and so forth. In addition markets in the real world are not perfect, such that the ability to diversify all of the non-equity risk may be limited.

The IASB is debating (along with the FASB) whether a fair value risk adjustment should include or exclude any risk that is not correlated with the equity market. This is a critical issue that will materially affect the fair value of property/casualty claim and defense cost liabilities. For example, under a narrow definition of systematic risk, earthquake insurance coverage would not require any risk premium — because earthquakes are not correlated with equity market returns. In contrast, under a broader definition of systematic risk, earthquake insurance coverage might attract a large risk premium — because even after it is diversified by issuing many policies, earthquake claim experience is highly volatile, exposing the insurer to the potential for massive losses.

In Section 5.5 of the paper, we discuss risk margin issues in detail. In calculating our risk margins we chose an approach that adopts the broader definition of systematic risk and measures risk empirically in terms of the amount of volatility in the ultimate claim costs for a portfolio of insurance contracts. Our chosen approach is illustrative and should not be interpreted as an endorsement of any particular view on the systematic risk issue. However, since it is based on empirical margins observed in the insurance market, it largely finesses these theoretical issues, capturing implicitly any market imperfections and reflecting the manner in which insurance risk is actually priced by the market.

Our analysis indicates that the resolution of the many implementation issues that we have identified will materially affect how the fair value of claim and defense cost liabilities will compare to their nominal values. In addition, because different methodologies produce different results, variations in implementation approaches by company will affect comparability across companies.

Impact of Fair Value on Financial Results

Applying the discount for the time value of money and the two alternative market risk margins to each company's GAAP claim and defense cost liabilities, we restated balance sheets and income statements to a hypothetical fair value basis and compared them to the corresponding GAAP results. The results are presented in Section 6. In summary, we observed the following:

- The magnitude of the changes from nominal to fair value liabilities varies significantly by product line, but is generally consistent with accepted perceptions of the characteristics

of these three products. For Personal Auto Liability, the combination of relatively low reserve risk and historically low interest rates causes the fair value to be close to the nominal value at year-end 2002; in a more normal interest rate environment the fair value of claim and defense cost liabilities is typically 4% to 5% below the nominal value. For Workers Compensation, while the amount of reserve risk is relatively low, the longer claim payout pattern creates a much deeper discount, causing the fair value of the liabilities to be substantially lower than the nominal value; typically 11% to 12% below the nominal value. For Medical Professional Liability, the measured reserve risk is sufficiently high that it almost offsets the discount, resulting in a fair value liability that is marginally below the nominal value at year-end 2002; typically fair values will be only 7% to 8% below the nominal value.

- The magnitude of the fair value adjustments vary over time and across companies, reflecting differences in interest rates — and also reflecting differences in expect claim payment patterns and the measured amount of reserve risk. Claim payment patterns vary by company, due to real differences in the make-up of the customers that they insure. There is also some variation in company-specific patterns over time due to the volatility of the actuarial data used to develop the expected payment pattern; this latter variation is probably spurious, contributing “noise” to the measurement of the fair values. More significantly, there is variation in the measured amount of reserve risk — between the two methods that we used, and for a particular company over time. More research into the measurement of risk is required, to avoid spurious variation in market risk margins over time and across companies.
- Of course, some of the variation in the measured amount of reserve risk should be expected across companies, reflecting differences in the characteristics of their insureds. However, we encountered several companies for which the measured amount of reserve risk is actually greater than the amount of market pricing risk — implying that these companies will, in theory, need to report a loss at the time the business is written. (That is, because the fair value of their liabilities will exceed the fair market premium for the contracts.)
- Some have suggested that fair value be implemented on the asset side of the insurer’s balance sheet, without a corresponding implementation on the liability side. Our results demonstrate quite concretely that this will introduce significant volatility into the reported income for each product line — even in situations where a cash-flow matched investment strategy is employed.
- Our results also demonstrate that if fair value is implemented for assets and liabilities, then the volatility of the investment returns is offset by contra-volatility in underwriting. To obtain a meaningful measure of performance, it will be necessary to look at the two sources of income in an integrated way. We have attempted to construct a financial statement presentation that is a first step in this direction.

Conclusions and Implications

Our research into the measurement of the fair value of property and casualty claim and defense cost liabilities offers several insights into the extent to which fair value accounting meets its intended objectives.

Reliability

It is an open question whether the estimation of discounts and market risk margins can be sufficiently reliable to support their inclusion in fair value estimates. The empirical data upon which these estimates rely are unstable, requiring a significant amount of judgment. Additionally, the particular method chosen to determine the market risk margin can yield substantially different results, suggesting that variation in the market risk margins across companies might be more reflective of the chosen method than of true differences in risk profiles. To achieve consistency, consideration will need to be given to some level of standardization in the implementation of fair value.

The implementation of fair value may not actually move reported results materially closer to economic reality. A primary goal of fair value is to move the financial reporting of financial instruments closer to market values, resulting in financial statements that are closer to the underlying economic reality, increasing their transparency. As part of our work, we estimated the true economic margins earned on each product for each coverage year, using after-the-fact experience reflecting the actual claim payments and interest rates. The correlation between U.S. GAAP operating ratios and these economic margins is quite low, suggesting a lack of transparency in the reported results. (In other words, the GAAP results do not provide the user with a true measure of the economic performance during the period.) However, the correlations between the fair value operating ratios and the economic margins are not materially better than those relating to U.S. GAAP, suggesting that the move to fair value may not materially increase transparency. This is because claim reserves are subject to considerable uncertainty, with significant potential for estimation error, and this phenomenon does not disappear with the adoption of fair value principles. Stated quite simply, the issue is whether it adds value to refine an estimated liability by incorporating fair value economic elements when the underlying estimate of the nominal liability is so uncertain.

Relevance

The preparation of fair value estimates is complex and will take considerable education of actuaries and others – both to develop the estimates and to use them. The current use of nominal estimates has a substantial advantage over fair values, in that nominal estimates are easy to understand. In addition, testing the adequacy of nominal estimates is straightforward. External users do this routinely, using information published by each company. In contrast, the time-value-of money and market risk margin elements add significant complexity, requiring a greater level of sophistication. How quickly and easily fair value measures can become relevant to both internal and external users of financial statements is a point of critical debate.

Of course, the use of fair values will move financial reporting closer to underlying economic reality. Few would dispute that market prices include elements for the time value of money and margins for risk-taking, either explicitly or implicitly. Many believe that a closer correspondence between economic performance and financial reporting will improve decision-making, by removing incentives to manage towards accounting income rather than economic value creation.

Cost

The additional analysis and assumptions required to support fair value estimates will result in a substantial investment by preparers of financial statements. While our results might be interpreted as a proof-of-concept, demonstrating that the data and methods necessary to perform the calculations can be developed, there will need to be significant further research and development on methodology prior to implementation. In addition, the data that we used were not perfectly suited to the task. For example we used some data that were net of reinsurance, where direct data would be more appropriate. In some areas, additional history for the time-series data would also be desirable. Further investment, to develop the data and refine the methodologies, will need to occur prior to implementation.

The fair value calculations are complex, and will require that informed judgments be made at several critical junctures. Preparation of fair value estimates for property and casualty insurance liabilities will therefore require the ongoing use of trained experts.