

**APPRAISAL VALUES - A COMPARISON OF**  
**EUROPEAN AND NORTH AMERICAN PRACTICE**

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**BIOGRAPHIES**

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**ABSTRACT**

The Valuation of Property-Casualty Companies and Appraisal Value work generally are areas where actuaries are increasingly becoming involved. Appraisal Values are also increasingly being used in mergers and acquisitions many of which are international in nature. There are some differences in approach in the UK, Continental Europe and North America and the paper presents a discussion of the methodological differences in the context of work for acquisitions.

Topics covered include the definition of earnings, earnings recognition, risk discount rates, allocation of capital and excess capital, investment policy and the impact of accounting rules and taxation. The main purpose of the paper is to stimulate discussion and future research on an international basis.

## 1. INTRODUCTION

- 1.1 The valuation of general insurance companies is an increasingly common feature of actuarial work, particularly in Europe. Most of the work arises from merger and acquisition activity, although in some countries the need for evaluations in other contexts continues to be significant.
- 1.2 In this paper, the authors focus on appraisal values used for acquisition work, and the differences between the European and North American approaches. Many of the differences arise from the different regulatory and accounting frameworks but there are also some fundamental issues.
- 1.3 In sharing their views and experiences, the authors hope to encourage a discussion of valuation techniques used by other actuaries. The authors believe that appraisal value methodology is a rich area for future research and also hope that the theory and practice can be developed further together.
- 1.4 Section 2 discusses the basic definitions of appraisal value and the background and Section 3 presents a more detailed discussion of major differences between North American and European practice. Section 4 introduces a stochastic viewpoint which underlies much of the thinking on appraisal values.
- 1.5 Presentation of the results of an appraisal valuation to non-actuaries unfamiliar with the basic concepts and language is the norm in continental Europe but less so in the UK. Section 5 presents the authors views on presentation. Section 6 gives some final thoughts.

1.6 In preparing and presenting this paper, the authors wish to acknowledge the contribution of the many past authors on both sides of the Atlantic. They are too numerous to mention as virtually every paper on financial planning, reserving and pricing is relevant to a greater or lesser extent. We include an extensive bibliography to aid further research and discussion.

## 2. DEFINITIONS AND BACKGROUND

- 2.1 The authors presented a paper to the Institute of Actuaries in London in June 1990 on the valuation of general insurance (or property/casualty) companies. The paper included a definition of an appraisal value together with an extensive discussion of the background issues, modelling, the form of the calculations and the investigations required to establish parameter levels. The definition is given in Appendix A with a brief discussion.
- 2.2 The definition of economic or appraisal value as the present value of future net earnings streams taken at appropriate risk discount rates is generally accepted by actuaries and others as a natural one throughout the world in our experience. Differences of approach arise from the interpretations of earnings, the role of risk discount rates and points of detail. The differences are discussed in the next section.
- 2.3 Modern portfolio theory and other investment work provides a theoretical basis for the suggestion that the value of a company is the present value of its future net earnings. Indeed, this is an accepted basis of valuation for almost any asset including property, bonds, licences and patents. Present values are typically taken at risk discount rates appropriate for the level of uncertainty for the various future streams of earnings and the purpose of the valuation. Earnings are taken net of appropriate levels of tax.
- 2.4 It is a simple extension of this concept to define the value of an insurance company as the present value of its future net earnings in exactly the same way. This approach to valuation is familiar to actuaries throughout the world and is commonly used by investment analysts. The

definition of the economic or Appraisal Value in Appendix A follows this approach.

### **Professional Practice**

- 2.5 The definition given in Appendix A is deliberately given as a practical calculation. It has proved valuable in practical situations, but is not regarded as the final answer in every detail by the authors. Almost every company valuation the authors have undertaken has required some innovation and a consideration of principles. The definition should be expected to develop and we refer the reader to the discussion of the deterministic versus stochastic approach later in Section 4.
- 2.6 No specific guidance notes are issued to actuaries in the UK concerning appraisal values for general insurance or property/casualty companies, nor would this be regarded as the usual approach as no statutory or regulatory obligations are placed on actuaries in respect of appraisal values. Appraisal value estimates are also made by non-actuaries, particularly by investment analysts and investment banks as part of their normal day to day activity. In many cases these are carried out in much less detail than normal by an actuary though often shortage of information is a constraining factor.
- 2.7 Actuaries may be specialists in insurance matters and risk but have no ownership of the concepts underlying the appraisal value definitions. We believe that it is important that actuarial theory works in tandem with modern financial theory and does not invent a jargon of its own. We particularly refer the reader to the discussion of Shareholder Value Analysis (SVA) in Section 3.
- 2.8 The concept of an Actuarial Appraisal Value as suggested by

the existence of a draft Actuarial Appraisals Standard of the CAS clearly appears odd from a UK or European perspective. The need for formal guidelines in the US, however, is heavily influenced by the potential for appraisal values to be used by regulatory and tax authorities. For general insurance or property/casualty companies in Europe appraisal valuations supported by an actuarial professional report have tended not to be in the public domain. This is not the case with appraisals of Life Assurance companies, however, and the need for formal guidelines is perceived as more relevant in the UK.

A recent paper to the Institute of Actuaries by Salmon and Fine outlined some of the problems in this area arising out of a public contested takeover bid. The paper did not discuss in any detail the non-life element and no non-life appraisal value was mentioned in any offer document. However, the Institute and Faculty of Actuaries have set up two working parties; one for life and one for non-life to consider problems in this area.

#### **FURTHER BACKGROUND**

##### **2.9 *Market Price and the Appraisal Value***

An agreed market price for a company, whether derived from a secondary market price or a company acquisition transaction, is clearly factual. It is not necessarily a good guide to economic value. Many valuation approaches aim to estimate market value. A market price may be regarded as a realisation of a process of valuation derived from a deal between a buyer and a seller, or an average of such deals, and as such it is subject to the subjective opinions of the participants in the transaction. The value reflects issues other than a company's economic value or its ability to generate future profit. These issues include general market pressures, scarcity value,

negotiating skills of the parties, as well as the complex issues of potential synergies or conflicts between the buyer and the company and its current management.

2.10 Considering the differences between the Appraisal Value for a company from an actual transaction value can provide a very useful insight into the value being placed on synergies between the acquirer and the target company and also of the implicit risk discount rates that might be appropriate. However, interpretation is always difficult. This has been especially the case in recent market transactions in Europe where transaction values have exceeded appraisal values using any reasonable assumptions substantially.

2.11 Reasons often include the existence of hidden resources, though even adjusting for these (when possible) the transaction values often exceed appraisal values. A major contributing factor is the "1992" changes in the European insurance scene which have led many companies to consider such acquisitions "as necessary for corporate survival" as a major player at any price rather than a regard for shareholders interests. This is particularly true among continental Europeans who are often more strongly capitalised than strictly necessary for the business being written. Long term strategic interest appears to have outweighed short to medium term financial interests. Speculating on the economic consequences of this are very interesting but beyond the scope of this paper.

#### **A DETAILED APPROACH WITH EXPLICIT ASSUMPTIONS**

2.12 The appraisal value approach aims to be structured and is necessarily detailed.

The aim is to reduce the valuation to a model with

calculations based on explicit assumptions. These assumptions will be selected largely by judgement following various investigations.

2.13 The explicit modelling approach also analyses the detailed financial elements of a company, allowing a better understanding of its potential for generating earnings. The Appraisal Value approach therefore often leads naturally into other financial areas such as business planning and strategic work. Development of some of this activity in Europe is hindered by a lack of actuarial and/or financial awareness at the top of many European insurance companies where underwriting interests tend to dominate

2.14 An important feature of the appraisal value approach is that, being detailed, much depends on the availability of information to allow sufficient depth of analysis for reasonable assumptions to be made. However, being an explicit calculation, the appraisal value can then be tested for sensitivity to change in assumption. Whilst less information necessarily leads to greater uncertainty, the potential influence of further information on reducing the uncertainty can be assessed to some extent, by considering the impact on the results by making reasonable variations in parameters.

2.15 The Appraisal Value definition is separated into three constituent parts. There are no differences in approach between North America and Europe in this context. The method of valuing in three parts as given in Appendix A is very similar. The separation into three parts is notional to ease the calculation process. It is the total Appraisal Value that is important; the value of each of the parts is of lesser importance.



2.16 The approach values the company as a going concern but is easily adaptable to a break-up basis. We refer to our discussion of the definitions of earnings in Section 3.

#### **UNDERLYING PRINCIPLES**

2.17 The basic principles for appraisal valuations by actuaries therefore appear similar worldwide. The valuation is a present value of earnings rather than paid dividends or some other basis. Where repatriation of earnings to a group or parent company is subject to restrictive regulatory control or strong tax penalties then the valuation of net dividend payments may become more important. This is especially important in continental Europe.

2.18 In the next section we discuss the differences of detail and practice.

### 3. SIMILARITIES AND DIFFERENCES

#### DEFINITION OF EARNINGS

- 3.1 In the US, earnings for the appraisal value calculation are generally taken as statutory earnings. In the UK and European community (EC) these are synonymous with earnings as shown in returns to the regulatory authorities. The returns are primarily used to test solvency and aim to show liability and asset values on a conservative basis. Earnings are considerably distorted. In the UK and continental Europe, earnings from published stockholder reports are manually used in appraisal valuations for acquisition work. These may or may not be different from statutory earnings. The major difference would likely be in respect of restriction on profits taken in the latest years.
- 3.2 We cite two additional examples to show the potential level of distortion.
- 3.3 *Example 1:* In the UK, it is normal practice that no deferred tax provision is established in published stockholder accounts for deferred tax on unrealised capital gains on assets that are not expected to be realised for at least three years. In the returns to the Department of Trade and Industry, the relevant regulatory authority, a full tax provision is made.
- 3.4 The difference in treatment can substantially alter a valuation if large stockholdings have been maintained for some years. Neither basis is regarded as appropriate for an appraisal valuation for acquisition purposes and adjustments are generally made. A typical basis might be to assume the portfolio is realised over a period of years, allowing for any further expected capital gains, and the

tax due, calculated for each future period. Discounting would then be applied. Separation of investment returns into capital gains and income is often necessary and the asset portfolio is often modelled in detail.

- 3.4 *Example 2:* Under EC regulations depreciation of certain assets in the solvency tests is accelerated. These assets include computer equipment and company cars. In stockholder accounts, depreciation should follow reasonably realistic bases. Neither of these bases reflect replacement costs or lease values of the fixed assets.
- 3.5 There is distortion to the timing of the depreciation item of expense.
- 3.6 In general, in Europe we very much favour the expected published stockholder earnings as a basis of valuation as these earnings are the ones backing dividend or distributable earnings.
- 3.7 Not all published stockholder earnings are available for distribution. The minimum capital requirements of the regulatory authorities need to be satisfied and there may be severe tax penalties in some tax regimes, if distribution of earnings takes place.
- 3.8 Whilst earnings may be declarable, they are not available to the stockholders and thus a reduction in the appraisal value should be made for this. This reduction essentially arises because of the continuing insurance operation and that the funds are at risk. The reduction to appraisal value is often shown as a reduction to the value of future business. We discuss the calculation further under Cost of Capital below. (Please see Section 3.10 below.)

## **Market Asset Values**

3.9 The market value of an asset, as determined by a Stock Exchange or secondary markets, may be regarded as representing the present value of the earnings stream, but without the constituent components of net earnings and risk discount rates being explicitly identified. Taking market values of assets for the Appraisal Value therefore fits with taking value as a present value of future net earnings. In certain contexts, a return to first principles is needed and explicit calculation of present values of projected earnings, net of tax, at chosen risk discount rates may be more appropriate, for example, where sharp changes in market values are a distorting influence.

3.10 A detailed understanding of accounting conventions is required. Accounting conventions must be allowed for in determining, when the differences between the market or realisable values of assets and their accounted or booked values will emerge. The timing of tax items in accounts must also be adjusted for. In practice, the actuary can be faced with very difficult judgements and much depends on the views taken of the risks attached to the delay in emergence.

Accounting conventions and delays in the recognition of earnings are all considered in the context of published stockholder accounts in Europe.

3.11 Similar considerations apply, when considering the emergence of deficits or surpluses in held claims and premium reserves.

## **Cost of Capital**

- 3.12 Shareholders provide the capital for an insurance operation. They will require a larger return on their funds than if they invested them separately. This arises, partly because the capital is being exposed to the risk of loss in the insurance business and partly because it could be used elsewhere. Also, depending on the levels of solvency carried by the insurance company, investment policy may, or may not, be greatly restricted. In any case, insurance companies may be considered subject to greater investment constraints than the typical shareholder. To some extent, these constraints can be less burdensome for a company carrying a higher level of working capital than one carrying a lower level, but operating in the same insurance business lines in a similar way. In addition to the investment constraints, the shareholders' funds are exposed to risk of loss if unprofitable business is written, or unforeseen calamities occur. This risk must be compensated for by an additional return, which means that the earnings generated by the shareholders' investments must be discounted at a higher rate than if the investments were held separately.
- 3.13 Compensation for this discount arises from the profits on future business. If sufficient profits are not expected then the company may well have a greater break-up value than as a going concern. Implications for a potential acquiring company are clear even if placing a final value on the company is problematic.
- 3.14 All the above points indicate that some capital should be allocated to an insurance operation and that it should be valued explicitly as the present value of future market investment returns, but at a risk discount rate.

3.15 Many different bases have been used in appraisal work in Europe. The amount of capital allocated to the insurance operation is very much linked to the choice of risk discount rate, which we discuss below.

3.16 The amount of capital allocated has often been taken as a percentage of premium volume. The margin between the risk discount rate used and the market investment rate applied to the allocated capital then represents the cost of capital explicitly. This is often the preferred method of calculation, being explicit. In certain circumstances, however, no capital is explicitly allocated and the cost of capital is reflected by using a higher risk discount rate on future profit emergence. This only works if business is expected to be profitable. The level of allocated capital and choice of risk discount rates are therefore related.

#### ***Shareholder Value Analysis (SVA)***

3.17 Current management theory is using similar techniques to those underlying appraisal valuation. Shareholder Value Analysis (SVA) or economic value is the name given to the technique and is defined as "the net present value of expected cashflows discounted at the cost of capital". Cost of Capital, here, is the full rent needed to service capital as determined in the market place, rather than the definition given above. The rate is sometimes called the "hurdle rate" in US literature. The objective is to concentrate on items of value, the cost of capital and shareholder values, using discounted cashflow techniques and making due allowance for uncertainty. As with insurance companies, a gap can arise between such values and stock market values. The reason the junk bond market gave rise to an increase in activity was because these bonds apparently reduced the cost of capital.

3.18 SVA, per se, adds little to the technique used by actuaries in similar situations. However, it does provide a means of communication with our non-actuarial colleagues.

#### ***The Role of the Risk Discount Rates***

3.19 The perceived role of the risk discount rates in appraisal value calculations is very similar worldwide.

3.20 The risk discount rates allow essentially for three distinct factors:

(a) The time value of money. This is a concept which is second nature for actuaries.

(b) The tying up of capital in restricted classes of investments or other items that could be used elsewhere. In a world with unlimited availability of capital, we would not have to consider this separately from (a), but as there is a scarcity of capital, we normally need to add margins to rates which would normally be used if only (a) applied.

(c) Risk of loss. Given that the returns are uncertain and could easily be negative, the capital provider will require an additional return to compensate for this.

#### ***Choice of Risk Discount Rates***

3.21 Conducting an appraisal value calculation requires a detailed split of the company into its constituent parts and a separation of written business into major classes. In general, there will often be more than one discount rate. Given that the risks of different classes will be different, it is appropriate to use different rates.

- 3.22 The selected risk discount rates are closely related to the quality and uncertainty surrounding the choice of parameters used in any modelling of future profitability. In carrying out investigations, an actuary should, therefore, not only be seeking to project and expected value of future earnings, but also to assess the levels of uncertainty in those projections.
- 3.23 The allocation of capital between the various lines to compensate for the different levels of risk is a complex task and beyond the scope of this paper. However, we would point out that writing two separate and uncorrelated lines of business is likely to reduce risk, justify a lower risk discount rate and hence justify a higher appraisal value. This potential for diversification of risk can become an important consideration.
- 3.24 To a large extent, the allocation of more capital to a class of business should be compensated for by a reduction in the risk discount rate. Where all the available capital is allocated, then the average risk discount rate for the total company is comparable to the internal rate of return on capital required by the potential purchaser of the company, called the "hurdle rate" in US terminology. It should be noted here that all capital should be allocated for this to be valid not just the regulatory minimum solvency margin as suggested in some actuarial literature. Alternatively, where minimal capital is allocated to the insurance operations, then a higher risk discount should apply. The increase in value, arising from carrying on insurance, should be viewed as providing the additional return to the owners or controllers of capital, to compensate for the additional risk to, and constraints on, capital.



- 3.25 The allocation of capital to classes of business can be regarded as merely a mechanism to ease calculation, since whatever capital allocations are made, the same answer for the appraisal value should arise. The choice of whether to explicitly allocate capital and how much depends heavily on the purpose of valuation, the complexity of the operations, some of which may be non-insurance, and the ease of presentation of results.
- 3.26 It may be appropriate to use different discount rates for valuing the emergence of profits on existing business from that used in determining the value of future written business. Most of the delay in the emergence of future profits will arise from investment earnings on held claims reserves and can be predicted reasonably accurately. This suggests a lower margin for risk in practical calculations, however, the impact of different levels of risk discount rate on this component of value is relatively small and the same rate as for future business has often been used.
- 3.27 For the value of future written business, much depends on the terms of trade on which the company writes business, but it will also be affected by the development plans and changes in market conditions. These are clearly more difficult to forecast and subject to greater uncertainty. This suggests that they should, therefore, be discounted at a very much higher rate.
- 3.28 The selection of risk discount rate or rates is also heavily dependent on the purpose of the valuation. Where the valuation is for purchase, the risk profile of the buyer needs assessment. Where the valuation is for sale, with no clearly defined buyer, then uncertainty will necessarily remain and calculations based on a range of values should form a vital part of the valuation. Estimation of risk discount rates implied by market values

or obtaining values from actual transactions is difficult, but they are an extremely useful benchmark. Further research in this area would be very useful, though relationships would, of course, change with market conditions.

- 3.29 Any risk discount rates selected by the actuary, are necessarily somewhat subjective and chosen from reasonable ranges, rather than exact point estimates. The authors strongly recommend that, as with the other critical parameters of the appraisal valuation, the sensitivity to choice of assumption forms an integral part to any investigations. We discuss the presentation of results further in Section 5.

#### ***Value of future Written Business***

- 3.30 This part of the valuation separates each element of net earnings such as premium, claims, expenses, commission, investment income attributable to the insurance operation and reinsurance and tax for each main class of business. The net earnings are discounted potentially at the different risk discount rates appropriate.
- 3.31 Typically, in European work, we have found that varying parameters over the first 5 years and then assuming average profitability levels, essentially averaging over the future underwriting cycles, is sufficient for practical work.
- 3.32 Certain reductions to the present value calculation are considered, not only for the Cost of Capital discussed above, but also for under-capitalisation and the risk of adverse short term catastrophic experience not present in the earnings projection. These reductions, are best understood after the discussion of the stochastic viewpoint in the next section. The reductions arise in our

definition in Appendix A partly because of the nature of the business written in London and partly because minimum solvency margins are very low in some countries outside of the EC. We understand that such adjustments are less likely to be considered in North America.

### ***Other Points***

3.33 A detailed discussion of the importance of the various investigations needed to estimate parameters in the appraisal value calculation is outside the scope of this paper. We would remark, however, that the claims reserve review is the most important in Europe as it is in countries of North America. There is substantial variation in the adequacy of reserves between countries in Europe and, perhaps more importantly, between companies in an individual country. Some of these variations are systematic being dependant particularly on the taxation regime, some arise perhaps because of the weakness in regulatory monitoring and control. It should be recognised that EC countries are currently struggling towards a common regulatory framework, but still have many years to go before consistency is achieved.

3.34 Other investigations of expenses, asset yields and asset allocations, organisational and systems analysis and of the market are also vital and similar considerations apply worldwide. The quality of data available, however, varies enormously and generally less is available in Europe than in the US.

#### 4. THE STOCHASTIC VIEW

- 4.1 A feature of general insurance is its capacity for very sudden and adverse or catastrophic reductions in earnings. Particular classes of business are very prone to this. Typical examples are high layer or catastrophic excess reinsurance business, or where gaps in inadequacy in outward reinsurance programmes become exposed by large or aggregation losses.
- 4.2 Investigations can show the exposure to such adverse experience and quantification can also be attempted by testing the insurance portfolio against various scenarios of large loss, but the timing of the adverse experience remains necessarily uncertain. The scenario testing approach should obviously incorporate the special pressures that occur in organisations following such losses, including the financing of adverse cash flows as reinsurance recoveries are awaited. Virtually all classes of general business carry considerable ability for producing surprise and, to some extent, focusing on catastrophic falls in earnings is the extreme case.
- 4.3 In the long term potential diversification through reinsurance and an approach based on averaging profitability over the period of an underwriting cycle can be considered. This indicates separating the valuation of future written business into two parts - the long term after, say, 5-10 years based on long term average assumptions and the short term taking account of short term fluctuations each year.
- 4.4 A stochastic view helps in understanding how values for short term features should be considered. Essentially, a company can be viewed as its set of potential future net earnings streams based on various scenarios, with an

associated probability distribution. In theory, these scenarios include all the possible influences, both external to the company and from the internal management team present or future. Net earnings in a future period will obviously be partially dependent on the track record and decisions in earlier periods. Current restrictions on strategy, arising from a small capital base, may be small if good profits are made and conversely. In the extreme, adverse experience may reduce a company to insolvency, and without a strong capital backer with available funds, any future potential for earnings is lost.

- 4.5 With this view, in valuing a company, we are placing a value on the entire distribution of future net earnings 'paths', having regard to the purpose and context of the valuation. In theory, simulation techniques and, perhaps the application of utility theory, could place a value on the company's operations. In practice, further research and more widely recognised methodology is needed for this approach to have widespread application. Nevertheless, a comparison of this potentially sounder approach with the deterministic approach is useful and can provide valuable results.
- 4.6 Usually, we operate in a deterministic framework as presented in the definition in Appendix A and project expected net earnings streams and value using risk discount rates. This approach handles the uncertainty or risk profile within the choice of risk discount rate.
- 4.7 However, the risk discount rate can be viewed as purely notional and merely a derived number relating the value of the company in, say, a secondary market to a single choice of net earnings stream. The earnings stream is just one realisation from the distribution of potential earnings streams available. The stochastic approach, in effect

unbundles the problem literally by adding further dimensions to the risk profile.

- 4.8 This also draws attention to the need to clarify which of the net earnings streams is normally being used in the deterministic appraisal valuation. It should, perhaps, be noted that the choice of net earnings stream is not critical, provided risk discount rates are chosen consistently to give reasonable valuations. This point is important for practical work.
- 4.9 In general, the procedures used in establishing the net earnings streams do not necessarily generate the expected or mean net earnings streams. For example, consider the valuation of a start-up operation, following a high risk strategy of very high growth, but with a significant chance of failure. The net earnings paths in this artificial example may fall into two clear types of scenario - high level of earnings and high growth or low earnings and failure. In this example, typically, the actuary may well select near the mean of the higher earnings scenarios, dealing with the risk of failure with a deep discount. The choice made may, therefore, be nearer to the mode of the net earnings paths. Where this differs significantly from the mean, then the procedure for selecting the risk discount rate should be considered. For most companies, however, the above difficulties do not arise and the mean, the mode and the selected earnings stream may be regarded as similar.

#### ***Under-Capitalisation***

- 4.10 With a stochastic approach, a company suffering from under-capitalisation can be considered as being denied either certain net earnings paths, which show positive earnings following negative earnings leading to insolvency, or, at

the least, more severe restrictions in the early years of development.

- 4.11 As a starting point, therefore, such restrictions may be treated as a reduction to a deterministic valuation, and perhaps calculated as a proportion of the value of future business. Clearly, there is room for significant judgement in the valuation calculation.
- 4.12 When considering an insurance operation and the range of possible capitalisations, from the above analysis, undercapitalisation is often synonymous with those companies where the addition of \$1 increases the value of the company by more than \$1. There is, of course, a point of discontinuity, in that, below a certain level, supervisory authorities will close the company down and it will only have a break-up value. Then \$1 less of capital reduces the value of the company by a multiple of many times \$1.
- 4.13 In addition the qualitative analysis above highlights the need to consider a reasonable range of chosen net earnings streams and the potential influences affecting. Often, knowledge of the volatility of an appraisal value to even a small change in assumption is as important as any absolute value.
- 4.14 The authors believe that the stochastic viewpoint is the theoretically right one but that the deterministic approach typically yields results sufficient for practical work. Presentation of deterministic results is also usually easier to understand.

## 5. PRESENTATION OF RESULTS

5.1 In practical work, all the care and attention to detail can become irrelevant, if results are presented badly and not understood by the recipient. The authors regard proper presentation and communication as a significant part of being a professional actuary, whether employed by a company or acting as an independent consultant. This is especially important if the recipient of the work is not a technically proficient specialist. This has often been the case in the appraisal value work of the authors.

### *Sensitivity Analysis*

5.2 It is rare that presentation of a single Appraisal Value using only one set of assumptions is adequate. In estimating an Appraisal Value the actuary will have formed a view on many parameters, and some assumptions may be given to him. A view of reasonable ranges for assumptions and their interdependence will naturally have been formed. For instance, lower portfolio growth may give rise to a higher expense ratios and therefore lower profitability, but perhaps with more certain profitability. Inclusion of the sensitivity of Appraisal Value to reasonable changes of assumptions would, therefore, be usual.

5.3 The sensitivity analysis can also indicate where management action may best be applied to maximise value post acquisition.

### *Impact of Results on Current Management*

5.4 The results of the investigations undertaken also can affect future management action. A simple example would be where claims reserves were judged to be so inadequate as to endanger solvency. In these circumstances, projecting the



company on an on-going basis assuming no major changes in management approach would not be right.

### ***Income Statements and Balance Sheets***

- 5.5 The Appraisal Value calculations suggested in Appendix A are based on projecting future earnings for published stockholder accounts and then discounting them. Except where there is a minimal insurance operation, the company's earnings should be explicitly calculated for at least five years and presented as income statements and balance sheets for each future period, based on the accounting rules. Restatement to a statutory solvency basis used by regulators should also be considered.

This presentation can give considerable insight into the company's finances. For instance, it can show a projected need for a capital injection or the inability to service expected dividend levels. It also begins the process of post acquisition business planning.

### ***Value Added and Profit Margins***

- 5.5 The calculation of an Appraisal Value naturally suggests the idea of an insurance operation adding value to a capital base. As we have discussed, by introducing allocation of capital to the classes of business we can consider the concept of the cost of capital as the margin between the risk discount rate and the investment rate. The insurance operation must produce sufficient returns to service the capital at least at this level in order to add value. It is natural, therefore, to consider the value added by writing just one year's written business.
- 5.7 The value added by writing one year's written business taking into account any cost of capital, is often called

the "profit margin" for than piece of business. The profit margins per unit of written premium, and how they are expected to change in each future year and why, should form part of any presentation. They provide a very good method of showing how profitability changes over time by class of business.

5.8 It should perhaps be noted that this presentation of profitability is not widely used in European or North American countries. Traditionally, companies have monitored underwriting results and more recently insurance results, which includes investment income on reserves. However, the development from considering pure underwriting result towards monitoring profitability by insurance result is also still not fully in place in some European countries and some companies. For stable portfolios in stable conditions the insurance result and profit margin are very similar. Whilst we regard profit margin as the correct concept, for practical management of profitability it may be more appropriate to use insurance profit as it is more closely linked to accounted revenue items in a given period. It is therefore easier to understand, less subject to future assumptions and so less open to manipulation.

5.9 When choosing risk discount rates for the constituent parts one will in fact get the shareholders or free reserves being valued at less than its face value because of the "cost of capital". This sometimes creates some presentation problems when talking to actuaries, though in the authors' experience the financial community find this approach easier to understand. They are familiar with Investment Trusts standing at a discount to net asset values because of the difficulty in extracting capital and restrictions on the use of that capital. If risk is properly quantified in an appraisal then an aggregate approach or constituent approach will give exactly the same

answers and the aggregate approach is sometimes easier for actuaries to understand. However, the discount to net asset value makes the financial mechanics of the insurance operation easier to understand. In particular it clarifies the position about injections of capital ie. an injection of capital will increase the value of a company by less than the amount of the injection unless either more profitable business or less risk is involved.

- 5.10 A feature of some European and indeed US lines of business is mandated rates which may be consistently unprofitable for social reasons. This clearly gives rise to negative goodwill. Some companies produce consistently good performance over the decades and some tariffs generate guaranteed profits and this should be reflected in the valuation. We should recognise the long term structural features of a market.

#### ***Value Added and Synergy***

- 5.11 The value-added approach is also often used to display the impact of synergy of an acquirer with a target company. Typically, value may be built up from a valuation based on pessimistic assumptions, to one based on assuming the target company continues with its current methods of operation unchanged and finally to one based on optimistic assumptions involving all the possible beneficial synergies. This method of presentation is extremely powerful, relies fully on the value-added approach and the calculations are easily carried out within the Appraisal Value framework.

## 6. FINAL THOUGHTS

- 6.1 In the paper we discussed practical approaches to the valuation of general insurance companies based on projected earnings in Europe and North America. The basic approach is a natural one for actuaries but differences of detail are present. We have suggested where we believe further research would be most useful.
- 6.2 It should always be remembered, however, that other valuation methods do exist and may be more commonly used in the market place. Current transactions values have suggested this. In this context, the worth of the Appraisal Value framework is not diminished but enhanced in that it can help make explicit some of the more unsound economic assumptions implicit in transaction values and provides a valuable tool for management.
- 6.3 The purpose of this paper is to encourage discussion and future interest. We look forward to the discussion and hope that North America and European practice can develop closer together.

## APPENDIX A

### DEFINITION OF APPRAISED VALUE - UK

A1 The Appraised Value is calculated at the valuation date in three sections.

#### *Adjusted Net Asset Value*

The balance sheet net asset value is adjusted to allow for the value of any asset or liability not expected to generate net earnings at levels implicit in a market valuation or to realisable value or other chosen valuation basis which may be dependent on the purpose of valuation.

An allocation of assets to the insurance liabilities is required, which we call the insurance assets. The approach normally taken by the authors is essentially as outlined in Ruth Salzman's CAS paper.

#### *Other Value arising from Past Written Business*

This includes any surplus or deficit in insurance reserves and requires an assessment, on a prospective basis, of all claims reserves, premium reserves and insurance funds representing business written in the past for both past and future exposure periods. It also includes the value of future investment income attributable to these reserves, based on the insurance assets and how they may change as the reserves run off, any expenses not reserved for but attributable to the administration of the payment of net claims, and other expense items arising from the run-off of the balance sheet. First, the timing of the emergence of each of the earnings streams, net of tax attributable, is taken into account; then discounting is applied at selected

risk discount rates appropriate to the insurance operation, after having regard to the capital allocated to the insurance operations and the purpose and context of the valuation.

### **The Value arising from Future Written Business**

The additional value arising from future written business is based on the expected additional net earnings arising from future written business, usually including renewal business, discounted at appropriate risk discount rates. The projection of net earnings takes account of each of the elements of profitability, including premium, commission, other expenses, claims, investment income attributable to the insurance operation, reinsurance and any other item of revenue. Each element is allowed to vary for short-term structural changes and underwriting cycles. The longer term view of profitability and growth takes account of the company in the context of the market in which it operates and averaging of cyclical profitability.

The calculations are performed for each main class of business separately and taken net of tax. The timing of the emergence of profit is allowed for, as are the current levels of production and future potential growth. The resultant net earnings stream is discounted at the selected risk discount rates for the insurance operation.

Reductions from this value should be made for the cost of any restrictions to investment policy and the risk return needed to cover capital allocated to the insurance operation. In addition, reductions for undercapitalisation and the risk of adverse short term catastrophic experience, not incorporated in the projection of earnings above, should be made.

A2 The appraisal value is a practical calculation. The purpose and context of the valuation, qualitative judgement on issues such as a proven track record of results, quality of management, organisation and systems and their ability to cope with growth, and potential market profitability and growth all need to be considered.

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