

Do Actuaries know how to measure value ?

Some Interim Thoughts
by the Value Measurement
Steering Group

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Do actuaries know how to measure value?

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We all know that “Actuaries make financial sense of the future”. But we don’t seem to have a monopoly on this any more. Particularly in the area of measuring shareholder value, other professionals seem to hold the fort. Do we understand what they are doing? Is it any different to what we are doing in our more traditional areas? What can we learn? And can we add anything?

It would be nice to be able to answer all these questions. This paper doesn’t. But with your thoughts a future paper might, so come along to the discussion and contribute. What this paper does attempt to do is bring a little clarity to the questions, act as a bit of a dictionary, look at “what’s going on out there” (via an interview survey of practitioners) and start (and we stress start) to look at possible conclusions/ identify further work.

The Value Measurement Steering Group was tasked (by the Corporate Finance Committee of the Faculty and Institute of Actuaries) with looking at the value measurement techniques, analysing what was being done inside and particularly outside the actuarial profession and suggesting next steps. The paper is the output of not just the Steering Group, but also various working parties set up in conjunction to look at specific areas. Working Party 1 prepared a preliminary classification of techniques and Working Party 2 surveyed practitioners outside the profession. Details of who was involved and what we all did are in Appendix A, but many thanks to all for their inputs. It’s not over yet....

The Steering Group would like to thank all those who contributed to this paper and in particular thank the organisations that participated in the practitioner survey. Any errors in presenting their views (or any other errors in the paper) are the responsibility of the Steering Group alone. The views expressed in the paper are at times deliberately controversial and do not always represent a unanimous opinion of group members, let alone any of their employers.

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1 Outline

Value-based Measurement (“VBM”) is promoted as providing a common language for shareholders, employees and other stakeholders. It can allow management decisions to be modelled, monitored, communicated and rewarded consistently. However, although it is conceptually simple, implementation requires a number of assumptions. There is wide debate on accounting adjustments, discount rates, and identifying true cost of capital.

This paper reviews current practice in VBM and its academic framework, before attempting to draw some conclusions on the implications for the actuarial profession. It first examines in section 2 the problems that value measurement is attempting to address, covering accounting adjustments, discount rate choices and riskiness of cash flow questions.

This paper focuses on relatively simple types of valuation methodology, which have many links to traditional actuarial discounted cashflow techniques. In particular it does not cover more advanced options/contingent claims pricing techniques which can also be considered in this context and are increasingly seen as being important. These have been looked at in some detail by the Life Assurance Value Measurement Working Party set up by this Steering Group and will be reported separately.

In section 3, the paper reports a survey of current practice in value measurement amongst the major consulting groups, with the aim of identifying patterns in this business, academic rigour, future trends, and the potential for actuarial involvement. Building on this, section 4 highlights the perceived (or actual?) difference between the “actuarial approach” and the big wide world’s agenda for value measurement and considers the opportunities and threats in this area for the profession. Finally, in section 5, the paper draws some conclusions and makes suggestions for future progress.

2 “What on earth are we talking about?”

A brief history of Value-based Measurement (“VBM”)

Value-based management emerged from the discipline of strategic management in the late 1970's. Interest in value-based methods reflected disenchantment with traditional accounting earnings, although the objectives of each are different. Value-based management recognised that accounting data was no longer providing a robust insight into business performance. Value-based methods are based on the concept that the underlying financial performance of a business is best represented by the change in its economic value. That is, the change in the net present value of its expected future cash flows.

Key figures in academic research and the popularisation of value measurement were mainly American. Alfred Rappaport wrote a number of articles for the Harvard Business Review in the late 1970's, and subsequently wrote *Creating Shareholder Value*, first published in 1986. Joel Stern of Stern Stewart & Co wrote *Earnings Per Share Don't Count*, published in the Financial Analysts' Journal in 1974. A number of other influential texts were written in the 1980's and early 1990's. Tom Copeland et al of McKinsey & Co wrote *Valuation* in 1989, and Bennett Stewart III from Stern Stewart & Co wrote *The Quest for Value* in 1991. Jim McTaggart et al from Marakon Associates wrote the *Value Imperative* in 1994.

The conceptual basis underlying these approaches is Residual Income, which is a long established accounting concept (see Appendix B for definition). However, in 1991, Stern Stewart & Co developed and trademarked Economic Value Added (EVA®), proposing many adjustments to conventional accounting income to compute EVA. Many of these adjustments relate to reversing effects of traditional accounting on understating assets and overstating current expenses, to separate growth and maintenance expenditures.

Stern Stewart saw the use of EVA® as a route to improving company performance and linking executive and staff incentives to this. The objective is to align shareholder and management interests, encouraging increased awareness amongst managers that their aim is to create value for shareholders, rather than just increasing market share, earnings or accounting profits.

Since 1991, the consulting industry has developed many similar methods, some proprietary. Some start from an accounting adjustment standpoint, others from a discounted cashflow model. Most of the major consulting firms now offer a range of services based on value measurement approaches.

In the rest of this section we take a light-hearted (not completely rigorous) look at how one might build a value measurement approach to value a company, before going on in the next section to look at our survey of which techniques are used.

Bluffers' guide to valuing companies

Assumption No. 1

Articles and textbooks (see eg Stewart, 1994 or Copeland et al 2000) tell us that a firm's primary concern should be to maximise value for shareholders (and that this is not just in the shareholders' interest, but that of society at large). This paper will assume this is true.

So do we just maximise market capitalisation?

Increasing a company's total market value is not necessarily maximising shareholder value, otherwise one could just invest more capital (ie big really would be beautiful). Capital is not free and the cost of that capital should be taken into account. When articles and textbooks talk about “maximising shareholder value” they are often really talking about share price performance or value, which can be identified with whether a company is a good user of capital. They are therefore usually looking at maximising something along the lines of the following:

EVA® is a registered trademark of Stern Stewart & Co.

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Total Value - Total Capital
or
Profit - Cost of Capital

This is not rocket science - it's basically saying we want a company to add value. (Accountants have had a similar concept, Residual Income, for years.)

Hang on - isn't that just maximising net present value?
Yes(ish)

So what's the problem?

Net present value is fine if you know all the cashflows, certainties etc. But in the real world we need to make approximations/assumptions etc. In addition value is forward looking, but the easy performance measurement is historical. And if share price is used for the total value bit, it depends on market perceptions and could be pretty volatile. Great! Just the job for actuaries. However, a number of others have got in there first with a variety of approximations, or measurement techniques.

What sort of measurement techniques?

There are probably 101 ways they could be classified, but one way is to look at their starting point:

1. Start with an asset based measure such as net asset value and adjust for goodwill, etc.
2. Start from accounting profit (statutory, or internal management accounts), make adjustments, and then multiply by an appropriate capitalisation factor such as price-earnings ratio.
3. Start with a cashflow model and derive a net present value at an appropriate discount rate allowing for risk, etc.

An alternative way to view the techniques is to look at how they define "value"/"capital"/"profit"/"cost of capital". (See next section)

Hang on - remind me why are we measuring this value stuff?

If assumption no. 1 is true, value measurement has all sorts of uses (see diagram opposite), including:

- Will this management strategy add or lose shareholder value?
- Which bits of the business are really doing well/badly?
- How can we change/restructure the organisation to increase value?
- How can we design management information to facilitate informed decisions?
- Can we align reward programmes to motivate execs/staff to maximise value?
- Can we communicate our company's value better to shareholders/analysts?
- Can we communicate better to regulators and rating agencies?
- How can businesses and shareholders make more efficient use of capital in the economy, thereby increasing productivity and benefiting all?
- To measure what the company is worth!

Various articles by proponents of various methods claim huge benefits of these techniques. We asked our survey participants what they thought (see section 3). In the meantime, let's look further at these various techniques.

101 uses for value measurement (or thereabouts)

Diagram of uses (generic and sector specific) for value measurement techniques

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Generic Company Uses</p>	<ul style="list-style-type: none"> ■ Management Info ■ Strategic decisions ■ Project decision ■ Mergers/demerger ■ Capital structure & allocation (especially in financial services) ■ Communication with analysts/ shareholder relations ■ Productivity gains through efficient use of capital in the economy ■ Harder for management bias figures that might be used in their remuneration 	<ul style="list-style-type: none"> ■ Aligning management & shareholder interests ■ Exec/employee reward ■ Corporate culture ■ Valuation of companies/target M&A (especially dot.coms) ■ Value brands ■ Customer value management ■ Change management and implementation 	
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Specific Section Uses</p>	<p>Property Development</p> <ul style="list-style-type: none"> - Economic Value Added (EVA)/ Discounted Cashflow (DCF) 	<p>General Insurance</p> <ul style="list-style-type: none"> - Valuation liabilities/business - Risk mitigation - Insurance standard ISAC 2002 	<p>Investment</p> <ul style="list-style-type: none"> - Equity valuation - Bonds - Property - Indices
	<p>Banking</p> <ul style="list-style-type: none"> - Current Value at Risk (VAR) 	<p>Life Assurance</p> <ul style="list-style-type: none"> - Statutory valuation - Profit test - Financial reporting - Product pricing 	<p>Etc...</p>

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Step by step guide to designing a value measurement technique

1. *Reminder: the formulae*

Total Value - Total Capital (if you are looking at overall value)

or

Profit - Cost of Capital (if you are looking at addition to value over one time period)

You are trying to get an estimate of a business's true economic profit.

2. *Let's see an example - simple trading example*

Let's start by looking at one time period (it's easier) and use a simple trading example:

- Suppose in this simple trading business there is little inventory at the end of the year: you could approximate profit by sales receipts, less expenses.
- You would then need to decide on your cost of capital (e.g. the interest a bank would charge you for the loan).
- You then discount (profit - cost of capital) over the single period if you want to estimate value at the start of the period.

3. *More complex example*

In many businesses, however, there are large year-end inventory positions (e.g. stock, goodwill, etc.).

In practice, for long-term businesses, the "profit" measure needs to be the change in some value which looks forward over future cashflows beyond the period end. In this case the discounted cashflow model is applied in 2 stages:

- Discount long-term cashflows to get year-start and year-end valuations and define profit as change in value.
- Apply one year value measurement model, as per simple example, i.e. remember to take off the cost of capital. Actuaries would call this allowing for the unwinding of the discount rate. Consider appropriate consistency between discount rates used in stages one and two.

The spirit of value measurement implies that the end-year inventory positions are valued at market levels. This can cause problems, particularly in long-term equity based businesses, as it effectively puts any shift in the way the market values the company or general market sentiment into "profit" and can create great volatility. If there is a complete solution to this out there, our working parties did not find it.

4. *Let's start - So what basic approximations do I need to consider?*

How do we get to appropriate definitions of profit and cost of capital?

"Profit"

- Firstly, decide the starting point - statutory (or management) accounts or cashflows or just increase in market value? The three approaches will sometimes give very different results.
- Subsequent steps will depend on this starting point:
- If market value - how should one measure the "market value" of the various divisions of the business, given that the divisions are not individually quoted on the stock market?
- If accounts - what adjustments do I make (e.g. R&D, investment, depreciation)?
- If cashflow - lots of issues - see over

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“Capital”

- How do I determine how much capital there is in the business? (In practice, this is a subjective issue and there isn't a right answer. If a market value approach has been used for “profit” then capital is sometimes also taken as market value.)
- How do I allocate this capital to business unit level? (e.g. risk-based capital, asset liability modelling, etc, remembering the sum of the parts may be greater than the whole.)

“Cost of capital/Discount Rate”

- The cost of capital is the return a shareholder would expect as a minimum for investing funds in a company. Typically the cost of capital is a weighted average that encapsulates the cost of equity and debt capital, the latter allowing for tax relief on interest payments.
- Decide how to determine the cost of both debt and equity capital - these costs can both be based on the Capital Asset Pricing Model (CAPM), although the market risk premium may differ between them.

5. *Alright, how do I decide on the appropriate cashflows?*

If you are calculating a profit by discounting future cashflows, you need to answer a number of questions about the level of detail to use when estimating those future cashflows:

- Who should estimate the cashflows and on what basis?
- Overall approach: deterministic/scenario/stochastic?
- Scope: gross, net cashflows to equity, accruals earnings?
- How do you estimate: historic data/adjust for trends/influences/assumption/forecast?
- Level of detail: public data/high level with internal data/detailed?
- Conservatism: best estimate/conservative/risk adjusted?
- Allow for corporation tax: realistically/crudely/not at all?

6. *And what about the discount rate?*

One could write a thesis on the discount rate itself. General questions that need to be answered include:

- Varying with time?
- Different rates for different groups of cashflows?
- In particular, do you have a different rate for excess capital?
- Use market levels?
- Adjust for riskiness of cashflows? Yes/no/distinguish properly between systematic and non-systematic risks?
- Discount rate adjusted for investor tax: realistically/crudely/not at all?
- Same as weighted average cost of capital for the company, as used in capital project appraisal?

It might be legitimate to use a different discount rate at the beginning and end of the period over which the change in value is being measured; for example, because of a change in interest rates or a change in the systematic risks facing the business. However, it would then often be useful to analyse the change in value into its component parts, so as to isolate the effect of the change in discount rates (just like analysis of surplus in a pension fund valuation).

Specific choices for discount rates could be based on one of the following (although some are more theoretically correct than others):

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- Fixed number
- Bank rate
- Long bond yield + margin
- Yield on assets backing the liabilities
- Corporate bond yield
- Market cost of equity: Inflation + real yield + equity risk premium
- Company cost of equity: Inflation + real yield + (beta x equity risk premium)
- Weighted average cost of capital, adjusted to local currency or not
- Yield on hedge portfolio
- One of the above + risk margin
- One of the above on stabilised historic basis

There is also the question of whether a single figure discounted value gives the information needed for the purpose in question. For some purposes a probability distribution of values, taking account of risk, might be more useful.

If the measurement is being done in order to determine the remuneration of key executives, it is essential that the process cannot be biased by the executives themselves. Moreover, to what extent should value added by market movements or changes in the discount rate for cash flows be taken into account for this purpose?

Working Party 1 looked at the above issues in more detail and gave a possible classification of some of the existing Value Measurement models using some of the above criteria. Their report is attached to the website version of the paper.

7. *This sounds difficult. Can I use one someone prepared earlier please...?*

Some of the examples of models that resulted from others' choices of these assumptions is given in Appendix B ("Meet the Methods"). We will now go on to look how value measurement works out in practice.

3 What's going on out there?

The Survey

One of the working parties, WP2, was tasked with finding out what was actually going on in the outside world, in particular:

- To find out what Value Measurement Products people were selling, where, and how they were applied; and to draw appropriate conclusions;
- To gather together any methodological material, academic or otherwise, identified in the process.

The work to date has focused mainly on a survey of consultants offering value measurement services. The survey questions and summary responses are appended to this report. The five firms surveyed cover a significant portion of the market, but later work could cover others, as well as with users of their services.

- Arthur Andersen
- Cap Gemini Ernst & Young
- McKinsey
- PricewaterhouseCoopers
- Stern Stewart

Noteworthy issues to emerge from working party discussions and/or the results of our survey are discussed below under the following headings:

- Motivations for introducing VBM
- Measurement techniques and methodology
- Application areas
 - Businesses interested in VBM
 - Products/services and application areas
- Future developments
- Areas of potential interest to the actuarial profession

Motivations for introducing VBM

It is clear that behind all VBM initiatives is the wish to align the interests of businesses and their staff more closely with those of shareholders. It is possible to identify two distinct reasons (or categories of reasons) for companies to introduce VBM programmes:

- A sense on the part of managers that the market may understate their company's potential. This is tied in with accounting issues, shareholder relations and communication and growing investor sophistication.
- A wish to bring about change within an organisation that reflects the interests of shareholders. This ties in with management accounting and capital allocation, investment appraisal and remuneration systems.

Both of these motives may of course be present in any particular case; equally there are pressures on companies to pay at least lip service to VBM techniques. This has perhaps been responsible for a fair amount of cynicism about the effectiveness of VBM within organisations and amongst investors.

Measurement techniques and methodology

In many ways this is a natural starting point for actuaries. It is the substance of the ground covered by Working Party 1 and also forms a significant part of the GIRO paper (2000). Indeed at least part of the motivation for our professional interest in the whole subject was the belief that measurement of value and/or value added is inherently complex. We also suspected that at least some of the work done in the area is lacking in analytical rigour and our work has not wholly laid this issue to rest. Some of the measures in common use are clearly open to criticism.

Practitioners seem to use a variety of measurement tools depending on the circumstances. It is commonly argued that the development of an appropriate tool that is applied consistently over time is more important than striving to find the optimal solution. Most also tend to emphasise that the fact of introducing a VBM programme is often much more important than choosing the optimum approach in any particular circumstances.

There is an observed trend towards the development of standard software packages. Most respondents seem to be more interested in the surrounding consultancy opportunities.

There is no obvious gap in the range of available tools although we are sceptical of the claim that VBM techniques exist that adequately deal with the valuation of dot.coms. The more advanced real option techniques were much touted as justifying the high valuations seen in early 2000, although this is outside the scope of this paper.

Application Areas

Businesses interested in VBM

The range of industries using VBM methods is wide and apparently increasing (see for example the range of companies quoted in the GIRO report).

In terms of sectoral interest, there seems to be a broad measure of agreement between respondents. They saw VBM as more important in capital intensive business and less so in the service sector. Sectors highlighted by respondents include:

- Telecoms
- Technology
- Commodities
- Financial Services

Although most respondents indicated interest across a wide range of sectors, one respondent emphasised the contribution of VBM in cyclical industries (e.g. commodities - electricity, oil, gas, paper, pulp - but general insurance is of course, also in this category).

Another highlighted the interest within under-performing businesses, and cited building materials, retail and state enterprises.

The emphasis placed on the financial services sector is not surprising. It is clearly linked in part with the difficulty of capital allocation to lines of business, which appears to be much less of an issue in businesses with substantial fixed assets. Actuaries are already significantly involved, particularly with insurance companies, reflecting a deep understanding of the business and of the drivers of value. Extension to banking seems a natural next step.

As well as variation between sectors, there is also a regional dimension. In the US, business has by and large

adopted VBM. The same is true in the FTSE-100 (but not to the same extent among the second tier of companies) in the UK. The largest new business consultancy opportunity is currently seen to be in Europe - with most interest in Germany and less in France. South East Asian businesses that wish to access international capital markets are also showing interest.

Products/Services and Application Areas

VBM services are being used to help companies with:

- Defining value adding strategies
- Identifying sources of value creation (and destruction)
- Aligning internal goals with those of investors
- Developing executive remuneration plans
- Internal management accounting systems that recognise value
- Improving investor relations
- Capital allocation (especially in financial services)
- Valuation in difficult areas e.g. brands and dot.coms
- A route in to CVM (Customer Value Management)
- Change management and implementation

The motivation behind developing VBM systems may include any or all of the above. Peer pressure and investor demand (especially in Europe in current markets) are also factors. A significant consultancy opportunity exists due to the need for specialist advice and additional resources.

Investment appraisal and cost of capital seem to be a frequent starting point. Most practitioners claim to use a range of tools, including DCF, P/E ratios, CAPM, DFA. A number stressed that the choice of tools is not always critical.

One stressed the importance of education at board level, and that it is critical to make the results of VBM exercises accessible and understandable. Another cited incentives as key to effective implementation - providing the right remuneration structure and balance between the various elements. If applied correctly, it should encourage management to set stretching goals and invest in the long term growth of the business.

Benefits are seen to rise in areas as diverse as:

- Internal awareness of the fact that capital has a cost
- Greater morale/cohesion/focus
- Improved remuneration structures
- Higher share valuation

Surprisingly on the face of it, Value Based Methodology seems to have little application to M&A transactions where more traditional measures continue to hold sway. However, one respondent characterised VBM as a response by management and shareholders to a wave of hostile takeovers in the US in the 80's, aiming to show that there was another way of releasing value.

Future Developments

Standardised software has already been noted as a trend. Another is "granularity" - the breaking down of value measurement to the detailed level. In essence this becomes customer lifetime value measurement leading to identification (and encouragement) of value creating customers and the avoidance of value

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destroyers. This is particularly applicable in the financial services industry. Another development that recognises the importance of maintaining growth within a VBM regime is Future Growth Potential, which seeks to measure the market's assessment of the prospects for growth in companies' current levels of value added.

There are also seen to be opportunities in financial services for ALM and stochastic modelling or dynamic financial analysis techniques.

There may be a growing shift towards the systems rather than consulting aspects. In particular data extraction and statistical manipulation may become more important skills.

One mentioned the possibility of securitisation and more tailored financing products replacing traditional debt and equity, which could favour actuarial skills.

Internationally, particularly in the US, value reporting is moving into the public domain. It remains largely used internally in the UK, although there is some involvement in discussions with analysts.

Areas of Potential Interest to the Actuarial Profession

It was positive to note that a number of practitioners noted the contribution that actuaries can and do make in the financial services sector and especially in insurance.

Much less encouraging were their general observations about the profession and our wider prospects in the VBM area (but they may see us as potential competitors!). Some saw us as defensive, expensive, over specialised and less trained than accountants in relevant disciplines such as corporate finance. We might well dispute these claims, but clearly to make significant inroads into VBM we have to overcome a perception that we are only suited to number crunching and method selection.

One area that has emerged as having considerable interest is the extension of our "analysis of surplus" methodology to new areas. It naturally generates the sources of changes in value from one valuation date to the next.

Other areas of potential interest/application for the profession include:

- Applications of real option theory to non-financial markets
- Analysis of customer lifetime value
- Valuation of dot.com businesses and of other cash flow dependent/driven operations.

Is the world really this gloomy for actuaries? Read on....

4 The actuarial perspective: do we need new glasses?

Actuarial view versus big wide world view

Looking at the discussions the working party had with practitioners, there seems to be a gap between how an actuary may approach (or be perceived to approach) a value measurement issue and a company’s agenda for value measurement. For example, the respondents indicated that the understanding and culture change resulting from the introductions were more important than the method choice. The table below elaborates:

Actuarial agenda for VBM	Big wide world agenda for VBM
<ul style="list-style-type: none"> ■ A tool for decisions ■ The “right method” is important ■ Precision, defined timescales ■ How do we classify the methods ■ Get excited about discount rate debate; nitty gritty of assumptions ■ Need detail to get sensible answer ■ Complicated cashflow models (“it’s really complex, only actuaries can do it properly”); theoretical correctness 	<ul style="list-style-type: none"> ■ A way of thinking strategically ■ Improve boards’ understanding: it’s not what you use but the understanding and culture change that comes with it that matters ■ An ongoing guide for operation - we can refine/amend as we go along ■ How do we communicate to stakeholders (VBM currently a buzzword) ■ Pragmatism - what can we do easily (eg why not start with our accounts and adjust a bit)?
Result: Actuary viewed as number cruncher	Result: Consultant viewed as strategic adviser

The non-actuary clearly has the upper hand on the “spin” at the moment, but before we change our glasses completely, what about the substance? To investigate this, we considered three examples.

1. Example 1: customer value measurement.

A classic example is the degree to which actuaries have generally failed to get involved in Customer Value Measurement projects. Actuarial papers have been published on the subject and it has become a regular convention slot, yet it would appear that very few actuaries have actually been engaged in significant projects and the actuarial profession would not be recognised by marketing folk as the first port of call for analysis even within the insurance sector. (Let us know if you know of actuarial achievements which prove this wrong).

Reasons for failure may be that organisations don’t generally have the budgets or the data to perform detailed analyses, and actuaries generally find it difficult to do a “just ok” job. Marketing departments may want proxy measures whereas actuaries want to calculate values of new business in our usual rigorous fashion. Indeed senior actuaries who would have the power to create budgets for such exercises may even regard Customer Value Measurement as “soft marketing stuff” because of lack of evidence that the techniques can really add value. (Oh ye of no faith).

2. Example 2: Embedded Value (EV) in life assurance

UK actuaries have been very good, however, at introducing and supporting the embedded value concept. Embedded value results, for both the balance sheet and the profit and loss account, are now

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widely accepted by external analysts who look at listed insurance entities. The Achieved Profits supplementary accounts of UK listed insurers have become the main focus of debate when analysts attempt to measure the companies' value and performance. The management of European, and perhaps to a lesser extent US, insurers have experienced shareholder pressure to produce something akin to the UK achieved profits numbers and many European insurers (including all the larger ones) are in the process of doing so.

It would, obviously, be disappointing if actuaries' involvement ever became confined to detailed debates on the choice of risk discount rates and tax adjustments rather than the broader uses of the numbers. We tried to introduce an even more complex method of measuring profit a few years ago (the accruals method) and now we are seeking to introduce fair value measurement which will require analysis of markets that don't exist (OK, so its not just actuaries who delight in complexity: we have found many friends in the accounting profession). Perhaps these processes all appeal to us because they fit so nicely into our agenda as described in the first column of the table above.

In a similar vein it may be possible for a critic of the actuarial profession to argue that actuaries cannot see the wood for the trees, since our closely analysed embedded values have been severely eroded by the impact of events which were not modelled (especially compliance risks and financial options), leaving one to wonder how accurate our assessments were. However it is precisely the fact that embedded values were impacted by these external events and therefore provided a measure of their size that has helped increase their importance to analysts. Traditional accounting measures were of far more limited help.

3. Example 3: M&A in the insurance sector

Another example might be found in the traditional actuarial approach to Mergers and Acquisitions in the life insurance sector. A significant focus, quite rightly, is on the embedded value measures including new business profit introduced by the actuaries. These are normally the most important factors considered by decision makers. The rigorous approach adopted by actuaries surely protects the new shareholders from paying too much for the existing business.

However an over-simple approach to goodwill, with an undue emphasis on applying some sort of factor to the current profitability of new business, can fail to capture all the relevant sources of value in a world of rapid change. In recent years the importance of market share and growth have resulted in high payments for goodwill and therefore the assessment of goodwill has become a much more important part of the price setting process. Models which explicitly consider the overall market potential and, for example, the potential (and value) of obtaining market share may be more useful.

Actuaries should normally be better placed than most to piece the full picture together but this involves knowledge of the uses and limitations of all the relevant inputs. We are talking here of actuaries as individuals in relevant employment, rather than firms of consultants. However, does the profession see its members as possible leaders of the multi-disciplinary teams that are necessary for this work? Is the profession only, in practice, aiming for a specialist role within a team? Is this consistent with ambitions to be the pre-eminent financial services profession? And is the actuarial role within general insurance M&A, currently all too often limited to a reserve review, one that could be significantly expanded?

SWOT ANALYSIS of Actuaries' chances at Value Measurement

So is there any hope for actuaries or shall we all give up and go home?

<p>Strengths</p> <ul style="list-style-type: none"> ■ Net Present Value natural habitat for actuaries ■ Mathematical/financial training ■ Some useful techniques ■ Professional credibility (especially for long term view) ■ Ability to offer critique ■ Depth of knowledge of core actuarial areas ■ At their best, exams encourage trainee actuaries to apply techniques to non standard situations ■ At their best, qualified actuaries combine rigour with an appreciation of the commercial environment 	<p>Weaknesses</p> <ul style="list-style-type: none"> ■ Current practice in financial services area too narrow, let alone other fields ■ Market perception of actuaries as expensive number crunchers ■ Lack of knowledge of what others have done and understanding of their perspective ■ Not focused on practicalities? ■ Low proportion of actuaries with general business perspective, strategic focus and strong communication skills ■ Seen by some as reluctant to work as part of multidisciplinary team: want to be “the expert” ■ Historic inconsistency with the real world in our core areas, with resulting effect on reputation
<p>Opportunities</p> <ul style="list-style-type: none"> ■ Use of VBM in financial services (“home ground”) ■ Use of VBM outside financial services (applications of real option theory to non-financial markets and the valuation of cash flow driven operations are areas still being developed) ■ Interest in our analysis of surplus methodology ■ Executive reward may provide a lead in ■ Customer Value Management - apply extension of current product pricing methods and data mining techniques? ■ Growing number of actuaries within multidisciplinary firms ■ Acceptance by analysts of EV in insurance sector ■ Opportunity to feed education needs into current review 	<p>Threats</p> <ul style="list-style-type: none"> ■ Others have head start ■ Thought leadership from business schools feeding through to management consultants ■ Outside financial services at least, actuaries are generally not close to corporate decision makers (accountants/ strategic consultants better placed to get work) ■ Increasing use of VBM in financial disclosures may strengthen the accountants' position

5 Conclusion

So what? - the challenge for actuaries

Can Value Measurement really be an area where actuaries make financial sense of the future? Here are our initial thoughts:

- Value Measurement is in many ways a natural habitat for actuaries. However, we will have to learn the language of the jungle before having any real credibility.
- There are many methods of measuring value in operation; all have their strengths and weaknesses. Actuaries may be able to bring further analytical rigour to some of these. But we should proceed only with caution, noting the practitioners' comments that the fact of introducing a value measurement programme is often much more important than choosing the optimum approach in any particular circumstances. However, it is important to avoid giving incentives to do the wrong thing and important to avoid bias.
- Value measurement seems to be of particular interest to companies where capital requirements are large, including financial services industries. This is a potential opportunity for actuaries on their "home ground".
- However, in general we have a long way to go to convince current practitioners we are not just expensive number crunchers. Possible ways-in identified include:
 - Extending analysis of surplus methodology
 - Applications of real option theory to non-financial markets
 - Valuation of cash flow dependent/driven operations
 - Customer value management.

So what's our answer? In true actuarial style, "Yes, but"

YES - if the actuary of the future (present?) lives up to the broadening in Vision and Values

BUT - seems to be a big hole at the moment - partly perception, partly reality.

Is it worth the effort?

Our working parties believe it is. Despite the work that would need to be done, the fundamentals in the SWOT analysis are good. Both the review of the education strategy and developments such as the corporate finance CPD syllabus are looking to address the weaknesses mentioned and build on the strengths. Actuaries have good opportunities within financial services and wider and some individual actuaries are already leading the way.

Hopefully this paper has raised awareness and started the education process (at least we learnt something!)

We would welcome your news on 'what next?'

Questions for discussion

We look forward to all your extra ideas at the meeting. Below are some questions to get you thinking:

- Do you agree with these conclusions?
- Should we create a "Value Management actuary"?
- How do we create a Value Management actuary?

Do actuaries know how to measure value?

- How much is the practitioners' view perception and how much reality?
- How can we raise awareness within the profession?
- How can we alter our image outside the profession?
- Have we missed out huge areas of application?
- What's the best way in?
- What should we do next?

We have deliberately tried to be controversial in the paper in the hope of stimulating a lively discussion. As Oscar Wilde said in 'The Critic as Artist':

"Ah! Don't say that you agree with me. When people agree with me I always feel that I must be wrong."

APPENDIX A - MEET THE TEAM

Steering Group

“The aim is to explore and make recommendations upon the opportunities for the use of Value Measurement Techniques within the actuarial profession. The Steering Group will oversee the project, establishing the working parties and co-ordinating their work. The Steering Group will evaluate the work and be responsible for the final report. It will be a cross-board working party responsible to the Wider Fields Board (WFB). The Committee is sponsored by the Corporate Finance Committee.”

This paper is an interim report of the Steering Group:

Colin McLean (Chair)
Sally Dixon (Secretary, Policy)
Mark Symons (Secretary, Admin.)
David Brown
Tony Silverman
Chris Waites
Colin Wilson
Chris Lewin
Chris Massey
John Pemberton
Martin Pike
Michael Sheard

Working Party 1

“This working party will attempt to classify the various discounted cashflow (DCF) models. The WP will review DCF-type techniques within the family of modern portfolio-type models for approaching risk.”

John Pemberton (Chair)
Iain Allen
David Brown
Steve Hardwick
Nylesh Shah
Anthony Stevens
Colin Wilson

Working Party 2

“The aim of this working party is to find out what is being done in practice by management consultants, accountants, applied economists and other users of value measurement techniques.”

Chris Waites (Chair)
Mark Symons (Secretary)
David Brown
Graham Fulcher
Colin McLean
Michael Sheard
Tony Silverman

APPENDIX B - GLOSSARY (or “Meet the Methods”)

- RI:** Residual Income. An economic profit = Net Operating Profit After Tax - Weighted Average Cost of Capital (equity and bond finance) x Total Invested Capital (total assets minus current liabilities). Also equivalent to total invested capital x the difference between return on assets and WACC. A term used to describe many value-based methods.
- VBM:** Value Based Measurement (or Management or Methods) refers to the class of metrics that attempt to measure Residual Income, being net profit after providing for the full cost of all capital, including equity capital.
- EVA®:** Economic Value Added, developed by and a registered trade mark of Stern Stewart & Co for their version of a Residual Income accounting concept. Accounting adjustments are made to charge for cost of capital using CAPM, and it aims to integrate P&L and the balance sheet. A number of consulting firms have their own terminology and methods of calculation for similar approaches.
- CVA:** Cash Value Added. This approach is based on actual cash flows, after non-strategic investments but before strategic investments, rather than adjusting accounts. Developed by Erik Ottosson and Frederik Weissenrieder of Gothenburg University.
- MVA:** Market Value Added is the market value of debt and equity less invested capital. An external market perspective of the total value created by a business on its invested capital. This may correlate with EVA over time in listed companies, on the basis it should be net present value of all future EVAs. Should reflect performance over a company's life, and is often used for evaluation and reward systems for senior executives over long periods.
- CVM:** Customer Value Management is a general term describing a range of techniques that aim to improve corporate growth and profitability via measurement of the lifetime value of individual customers, and economic profit created. This typically involves database analysis and identifying true costs of customer acquisition.

APPENDIX C - SURVEY QUESTIONS

QUESTIONS ON VALUE MEASUREMENT (WP2)

1. What types of business are, in your experience, interested in VM?
2. What services do you provide, and how are they applied?
3. What do you do best?
4. How effective do you consider VM methods to be?
5. How is “value” calculated/assessed in your models?
6. What is your assessment of what current models cannot do?
7. How will you seek to develop your models in the future?
8. How might actuaries contribute?
9. Do you see scope for actuarial employment?
10. Has your organisation published academic material?
11. Is there anyone else in your organisation I should talk to?
12. How is your organisation structured to deal with this work?
13. Are there any developments on the international scene that you feel we ought to be looking at?

APPENDIX D - BIBLIOGRAPHY / FURTHER READING

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LINKS

Reading lists are on <http://garnet.acns.fsu.edu/%7Eppeters/value/readings.htm> and <http://garnet.acns.fsu.edu/%7Eppeters/value/read.htm>. Some links on EVA® and VBM are on www.anelda.com.