## ABSTRACT OF THE DISCUSSION

**Mr M. H. D. Kemp, F.I.A.** (introducing the paper)**:** When I wrote the paper, I identified a few themes which I think are relevant to this topic, and I also got to undertake some crystal ball gazing. The most obvious piece of crystal ball gazing within the paper is, of course, to assume that the concept of fair valuation will, over time, be in the ascendancy. If I turn the clock back maybe ten or 20 years, then you might have thought that this assumption was bold, but if you consider the opposite, and argue in support of market 'inconsistent' or 'unfair' valuation techniques, then I think that you will see just how unlikely it is that this particular trend will reverse. We have Basle II for banks. There is the European Union's Solvency II programme for insurance companies. There are new accounting standards for pension schemes and new Financial Services Authority (FSA) rule books. They all point towards a fair valuation world.

Of course, we have not reached the destination, but, if you agree that that is where we are heading, then it seems to me that there will be some fairly fundamental changes along the way in how we think about risk, and how we measure and manage it. It is my view that this will fundamentally alter the actuary's tools of the trade, and even, maybe, what that trade is and who does it.

Take, for example, defined benefit (DB) pension schemes. I can draw out three particular messages from the paper for such entities. The first is that, from 60,000 feet up, most closed or even open mature pension schemes do not look hugely different from insurance companies, yet they are regulated, at least in the United Kingdom, in two different ways. This is not true in Continental Europe. It seems to me that there will be, almost inevitably, some kind of harmonisation in the U.K. between the two regulatory frameworks, whether it is pension funds moving towards insurance companies, insurance companies moving towards pension funds, or them meeting in the middle.

A second message from the paper for DB schemes is that the older valuation methodologies which fair valuation techniques are supplanting tend to involve more smoothing. So, not too surprisingly, the growth in fair valuation is likely to highlight more the asset/liability mismatches which exist within DB pension schemes. No wonder that there is greater enthusiasm for the concept of liability driven investment.

A final message which the paper has for DB pension schemes focuses on the degree of exposure which underfunded ones have to the creditworthiness of their sponsoring employers. This risk, as I am sure you all have appreciated, has opened up over a relatively short time scale. At the same time, there has been an explosion in the size and the use of credit derivatives. This is a market which is specifically focused on transferring credit risk. It seems to me that, to date, there has not been a huge interaction between these two emerging facets of the financial world, but the time is ripe for the two to become more closely linked. Understanding credit risk issues is therefore likely to become more important for actuaries in the future.

Similar, although not identical, messages are contained within the paper for insurance companies. Many of them have already significantly de-risked themselves — at least they have in terms of their market risk. This has meant that topics such as credit and liquidity risk have moved up their agenda, linking in with the point which I have just made about credit risk for pension funds.

I hope that Section 9, which focuses on credit risk, will prove particularly helpful for you, especially for those working within the insurance sphere. The current regulatory regime does claim to be 'market consistent', but, in my opinion, it does not achieve this aim when it comes to credit risk.

Section 9 also contains material on a number of matters with which actuaries may be less familiar, such as collateralised debt obligations (CDOs), and they may seem somewhat technical to some readers, but please do bear with them. It demonstrates that, really, there is no fundamental difference between market risk and credit risk. CDO technology, although typically

set up to involve taking views on credit, can be used equally to take views on any other sorts of risk or to take views on more than one sort of risk simultaneously.

Further, Section 9 shows that reliance on credit ratings, which is how the current regulatory tests operate, is not ultimately an appropriate way to frame market consistent capital adequacy standards. The debt which a CDO issues is typically rated by credit rating agencies, but this then poses the interesting question of whether a rating of, say, AA assigned to CDO debt corresponds to a rating of AA assigned to a more traditional sort of bond. I argue, in Section 9, that they do not (at least not when it comes to capital adequacy), and that, therefore, you need to focus more on metrics like credit spreads or other intrinsic measures of risk which come from the market, rather than from credit rating agencies.

The paper also has, in my view, important messages for risk management professionals.

I have talked about market consistency and its link with fair valuation. Ultimately, it seems to me, that, if you want fully market consistent risk modelling, then you cannot use the tools which have, typically, been used to date in terms of risk management and of risk measurement. Typically, these tools have focused more on historic time series and extrapolating them into the future than on current market implied levels of risk. To do anything else ultimately contradicts some of the key axioms which need to be present for the mathematics to work.

If the assertion is true for risk modelling, then it is also true for a number of other areas where actuaries get involved, including risk budgeting and asset/liability modelling of the sort which actuaries undertake for pension funds and insurance companies. When I first conceived the paper, I was going to ask why the term 'asset/liability modelling' means something quite different outside the actuarial profession from what it means inside the actuarial profession. Although there are certainly many good uses for asset/liability modelling, it seems to me that, if you follow through the details and the mathematics, you find that they are not necessarily quite the panacea for all ills which actuarial guidance notes and the like might lead you to believe. It is tricky to formulate them so that they are truly 'market consistent', and it is also tricky to identify a suitable objective rather than the subjective input assumptions on which it relies.

This brings me to the paper's message for actuaries. I think that the key message is that there is not really a message! By that, I mean that there is very little in the paper which specifically focuses on actuaries. The point here is that a fair valuation world is ultimately no respecter of professions. To work out the fair value of something, at least in theory, you merely go away and observe it (or related instruments) in the 'market'. This is not something which is exclusively actuarial in nature. In my opinion, this poses some opportunities and some threats for the actuarial profession. It will be up to you to seize the former and sidestep the latter. I hope that my paper provides you with some clues as to how to do so successfully.

Not only is fair valuation no respecter of professions, but it is also, in my opinion, no respecter of national boundaries either. This has interesting implications for how the actuarial profession (or other professions) think about themselves and structure themselves in a national versus a global context. However, by the time I got to this insight, my crystal ball had become rather cloudy. I look forward to finding out, in real life, in the years to come, how the U.K. actuarial profession will react to this emerging world.

**Mr M. R. Versey** (a visitor, opening the discussion)**:** I work in the insurance solutions practice of Lehman Brothers, focusing on the implementation of asset/liability management issues. The paper touches on a vast array of topics related to this, but, primarily, it highlights the fact that the various components of risk can and should be identified separately, and therefore managed separately. Companies are at many different stages of implementing risk monitoring and management practices, so I hope that this paper will help them to see what is possible.

Perhaps the biggest discussion around the theoretical attraction of fair values, which is given in Section 2.3, is the use of an equity risk premium in pension fund valuation. It may be useful to compare the equity risk premium with the cost of hedging the downside risk in equities; so, therefore, to include the risk premium without hedging is taking value for risk. This is a significant part of risk budgeting which all pension funds should be doing, to which the author refers in Section 8.3.

In Section 3 the author talks about separating group risk from the market risk, but I wonder whether, in a fair value framework, you could actually link that somehow to the idiosyncratic risk factor of a company.

In Section 4 the paper states that derivatives are becoming increasingly used. We certainly see that a great deal from the investment banking side. We create indices of risk free investments, which can then serve as new benchmarks. We can create swaps, which pay a total return on these benchmarks. In the liability driven investment world for pension fund management, we see a move to use swaps as overlays from existing benchmarks to new liability benchmarks.

Section 4.6 suggests that we could treat future contributions to a pension scheme as a form of corporate bond issued by the parent company. I think that this is a great idea. If pension funds did this, they would be able to treat the single name risk of the pension fund parent as just part of their portfolio. You could then reduce the overall risk to it by using CDS on the single name, or the relevant industrial sector.

Section 4.7 says that insurance company buy-out quotes are the correct fair value to use for pension fund valuations. I think that you would also need to take account that there will be additional regulatory capital and also shareholder profit requirements which would need to be incorporated. These requirements may stop pension funds and life insurance coming together.

Sections 5 to 7 look at risk measurement, particularly historic versus future risk factors, and suggest that implied data or market data should be more relevant than historic data. The question there is obviously: "Is the current view of the market risk better than the historic view?" At the end of the day, it is the asset managers who will use their skills with this risk measure to make trading decisions. Therefore, any risk measures used must be objective and realistic.

In Section 6.4 the author identifies a conceptual split in the return behaviour into several parts. The Lehman Global Risk model does exactly this. It assigns the risk to movements in over 300 global systematic factors — currencies, Treasury yields, swap spreads, volatility, inflation, credit spread bucketed by rating and industrial sector, and then uses historical data to analyse the absolute values of the residual returns which are not explained by any of these other factors. We do adopt the core factor approach, which the author uses in ¶6.3.7, to simplify the covariance matrix. By weighing the historic data to more recent market events, we can get nearer to a full fair value approach.

In Section 7.2 the author suggests that we can derive equity idiosyncratic risk from the implied volatility of options trading on each name. This market is definitely becoming more liquid, and hedge funds do, indeed, trade dispersion trades, where they bet index implied volatility against all the individual name implied volatility, but the problem, as the author says, is the data quality available, and his suggestion is interesting, but implementation is not at all obvious.

Section 8.3, on risk budgeting, is the area which I see of most relevance to the actuarial profession. We see a great deal of interest in the concept of asset manager 'skill'. This will become much more relevant as investment consultants and risk managers start analysing the components of risk. It would be interesting to know how many credit managers have actually outperformed their benchmark by taking duration bets, not credit bets, and how much additional risk was, therefore, actually taken.

Various models can help you to identify this skill through performance attribution systems, and I think that the implications of this are very relevant for the actuarial profession, who can take these risk factors and identify managers who have particular skills in managing different risk factors.

I agree with the author, in Section 9, that CDOs have helped us to think of credit risk as just another market risk which can be altered and changed via the capital structure of a CDO; that is, you can change the individual name risk to more of a market systematic risk, just by taking different tranches of the CDO. It appears that the CDO technology is here to stay, and that it will become an important tool in risk management.

I particularly like the author's idea, in Section 9.6, of looking at a life company as a CDO, and I think that this is particularly revealing in understanding who is really taking the risks. I would suggest extending this theory to incorporate the fact that different policyholder liabilities

are effectively different tranches sitting above the insurer's debt. For example, a ring-fenced with-profits fund would sit at the top of the capital structure, whereas, maybe, a non-profit long-dated liability, such as an annuity, should, perhaps, sit just above the Tier II debt, because it supplies a great deal of capital into the structure, and therefore bears a great deal of the market risks. Perhaps this explains why an annuitant should expect to receive a higher than risk-free return.

Section 10 discusses liquidity risk. Why does an insurer or a pension fund hold gilts? Does it need the liquidity? Does it need the security for members or policyholders, when it, itself, is an AA rated entity? It also brings back the argument about risk free rates. You can now trade CDSs, and hedge out credit risk. You could buy a pool of credit, hedge out the credit risk through CDS, and you will be left with swap returns, not gilt returns. What risk do you have?

What of the future? In Section 12 the author identifies this area as a new field for actuaries. I agree, particularly in the risk budgeting and monitoring of asset manager skill, scenario testing and liability driven investment.

Implications of identifying and understanding risk factors better will also enable better capital optimisation for insurance companies. However, there will remain conflicts between the different capital constraints. Will equity and credit managers eventually be the same people? Some investment banks have already merged their departments, and hedge funds are certainly arbitraging the capital structure, so it does look as if we are heading that way.

So, looking into the crystal ball with the author, I can also see that fair valuation will continue to expand. Certainly, the broad brush asset allocation splits which I studied in my actuarial examinations are gone.

**Mr C. G. Lewin, F.I.A.:** This is an interesting and useful paper. However, I believe that it fails to explore sufficiently one of the most important aspects.

In ¶2.3.2(d) the paper introduces the idea of 'intrinsic values'. I regard the difference between 'fair value' and 'intrinsic value' as being one of the key risks which needs to be managed in a fair valuation world, particularly when the difference is large. Now, 'intrinsic value' has a degree of judgement in its evaluation which is not normally present in 'fair value'. This does not mean, however, that 'intrinsic value' is any less important than 'fair value'. What I mean by intrinsic value is the average value which one would expect a representative group of long-term investors to place on an asset, or on a market, if they were influenced only by considerations of fundamental future returns. Intrinsic value, therefore, takes account of future income and future capital receipts, as well as the risk attaching to the level of those future receipts, including the possibility of default. Differing individual long-term investors will make different calculations of intrinsic value, which is why I speak of the average value derived from a group of such investors. It should be noted that my definition leads to a value which does not necessarily represent the value of the investment to the specific individual investor, which may be influenced by a range of considerations which are not experienced by the market as a whole.

It is common experience that fair value quite often differs from intrinsic value. For example, the fair value of the equity market in 1999 vastly exceeded its intrinsic value, as some commentators at the time bravely pointed out. These commentators looked at the yields obtainable on equities, and concluded that, in fundamental terms, they were unsustainable. Similarly, the fair value of the Scottish housing market during the 1990s, when house prices were much lower than in the rest of the U.K., was less than the intrinsic value at that time. Both of these distortions in fair value were later corrected, with fair values reverting to figures which were much closer to the intrinsic values current in 1999.

It is important to take into consideration why fair value may differ substantially from intrinsic value for a long period of time. Suppose, for example, that there has been a bull market in equities for the last two years, with little sign of it easing just yet. Those investors in the market who take short-term positions will evaluate the chance that equities will be higher or lower in (say) three months' time, if that is their time horizon. If they believe that there is (say) a 70% chance that the bull market will continue for at least another three months, it makes logical sense for them to invest, even if they believe that current fair values exceed current

intrinsic values. Long-term investors may be more wary of purchases if they, too, believe that current fair values exceed current intrinsic values. Therefore, the market will go on being driven up, mainly by short-term investors, until, eventually, many short-term investors start to believe that the 70% chance of a rise in three months has become 50% or less. The market will then crash, as the rise in fair values falters, and more and more short-term investors start to bail out. Because of general uncertainty at that time, the crash may reduce fair values in the short-term to less than intrinsic values, although there may well be a reversion to intrinsic values a little later.

The important point here is that fair values can quite logically differ from intrinsic values for an extended period, even if virtually the whole market recognises (in one way or another) that this is the case, but that, eventually, fair values will often tend to move closer to intrinsic values. Therefore, intrinsic values, just as much as fair values, are of importance to both short-term and long-term investors, although for different reasons.

What is it that may change the perceptions of short-term investors about the three-month outlook? First, of course, there may be their own perceptions that fair values have departed too far from intrinsic values to be sustainable. Media commentators, brokers' circulars and fashion may also play a part, and so could a sudden increase in uncertainty, for example because of a war breaking out, or there may be a feeling that long-term investors are about to move huge sums into or out of the market, for example for regulatory reasons or because their collective asset positions are beginning to differ substantially from their desired long-term asset distribution.

So, how can one evaluate intrinsic value? My suggested approach would be to look at the fundamentals of yield, price/earnings (P/E) ratios, likely earnings growth, expected risk premium, etc., and work out what would seem to be an appropriate current fair value for a group of long-term investors, assuming that supply and demand were in balance, and that there were no short-term investors in the market. This calculated fair value, admittedly based on assumptions and judgement, would be regarded as the current intrinsic value.

Once the intrinsic value has been calculated, the differences between it and the current fair value can be exploited by long-term investors, particularly those who are relatively unconstrained by liability considerations. The resulting strategic moves which they make can be regarded as risk reduction, rather than taking positions for speculative reasons. They will lighten their holdings in an overvalued market in order to reduce their risk of loss, and they will increase their holdings in an undervalued market in order to reduce the risk of being out of it when it performs comparatively well. Their timing will depend, crucially, on their assessments of when future movements in fair value will occur — although this is notoriously hard to predict accurately, and seldom will they get their timing exactly right. Averaging their strategic moves over a period of several months will probably reduce their 'regret risk'.

Thus, I hope that I have convinced you that fair value and intrinsic value are both important to investors, and that the difference between them can either be a major source of risk or a strategic opportunity. For the same reason — and this is very important — fair values will not be necessarily the most important yardsticks to use in judging the solvency of a financial institution, even though current fashions are leading us in that direction.

I suggest that accountants and regulators have been very clever in calling market values 'fair values', suggesting that these are somehow preferable to other values. For similar reasons, I suggest that, instead of 'intrinsic values', we should use the expression 'true values'!

**Mr M. G. White, F.I.A.:** Most of the material in the paper relates to the risk management of financial institutions, many of which are concerned with keeping their own risks within strict limits, with the balance of the real risks being carried by the underlying clients, usually individual long-term savers or investors of some kind. However, I found the analysis to be relevant to many areas of financial life, and I am going to speak about a number of these.

Most of the time I come from the perspective of a direct long-term investor, who is not bothered if share prices vary hugely, provided that the underlying companies do sufficiently well. I think that I am interested in the same 'intrinsic value' as Mr Lewin, whose contribution just now brings to mind Ben Graham's comments along the lines of the market being a casino in the short term and a weighing machine in the long term.

I will cover four points:

(1) This concerns shedding light on situations of self-delusion. Fair value financial reporting should not be the driver for properly recognising economic reality and managing risk accordingly — but, in practice, it may be.
(2) This concerns fair values as a vital stage in the evaluation for solvency purposes of insurance companies' insurance liabilities and reinsurance assets.
(3) This concerns derivatives as financial weapons of mass destruction — some thoughts on getting some comfort regarding the macro picture, that is whether or not there is a black hole to be revealed when the world's financial statements are added together properly.
(4) This concerns fees, expenses and the paradox of unit trust and investment trust pricing, and the potential role for the profession in explaining some financial facts of life to the world, and thus to the investing public.

Considering self-delusion, there are a number of areas in which financial reporting has not, in the past, reflected economic reality. Sometimes this has been intentional — in which case a trend towards fair valuation should shame people into recognising reality — but, where it has been unintentional, putting on fair value spectacles will help reveal what economic reality is.

Considering the use of fair values in solvency regulation, I thought that ¶¶2.2.10 and 2.4.2 were particularly interesting. I support the author's conclusion that fair value concepts have an important part to play in solvency regulation. I have been very concerned, for many years, at the games which people have played with the accounting and solvency treatment of outward reinsurance, in particular. I would have worded ¶2.2.10 slightly differently to indicate the French Government's concern over having to admit the low levels of solvency capital present in some cases — changing the accounting does not, in itself, change economic reality. Also, ¶2.4.2 on untraded assets and liabilities is highly relevant to the determination of the values to adopt — for solvency purposes, if a quoted market value is not available for an asset or a liability, that increases the need to err on the side of caution for both.

With derivatives, the black hole, if there is one, will not be revealed simply by asking everyone on either side of a derivatives contract to use fair values. For unquoted contracts, which I understand to be of immense significance, there must be huge scope to err slightly on the side of caution or optimism. At any moment, every contract must be an asset to one person and a liability to another. However, if both recognise it as an asset — and that could be, on balance, what is happening across the world as a whole — we would, indeed, have a huge unrecognised hole, where the accounting gives an illusion of more wealth than really exists. If such a hole exists, and is permitted to get deeper, a major adjustment, to use a gentle term, will one day emerge. Hence, I think of the term 'financial weapons of mass destruction'.

I think that this could be tackled with sufficient political resolve. If all unquoted contracts were registered with the local regulators (and here I am assuming that regulators around the world would work together), and the estimated assets and liabilities allocated to each counter-party were reported to those regulators by each counter-party as at a fixed date each year, such as 31 December, the regulators, at least, would be able to see whether two and two did, indeed, add up to four.

On the overriding importance of expenses in investment management, I start with the assertion that fund management is a negative sum game, and that the option exists for underlying clients to hold shares directly, incurring virtually no cost of holding in the process. Fair value suggests that, in the absence of strong evidence of enduring fund manager skill, an investment trust should be valued at below the market value of the underlying investments — effectively reflecting the discounted value of future management charges — and discounts are what we tend to see in practice.

If a financial institution were to hold shares in a retail unit trust or similar managed fund, with generally larger total costs and charges than investment trusts, and if we also assume that that financial institution is not able to sell the units and extract its capital for a number of years, the fair value of that holding would be very substantially below the market value of the

underlying investments. The optimum action would be to liquidate the holding. So, what does that say about the quality of the advice which leads individual clients to invest in vehicles with high charges? In aggregate, charges matter much more than any likely performance deviation, and the investing public needs the option of bypassing 'advice' and going for very low cost options.

**Mr M. R. Kipling, F.I.A.:** This magnum opus takes us from the vastness of 100-dimensional vector space to the more homely territories of 'equity land' and 'bond land'. It covers most of the familiar fields in which actuaries work, drawing attention to many similarities between them, but also to similarities with other experts' fields, which serves as a warning bell.

The paper highlights regulatory anomalies in life insurance, particularly the inconsistent treatment of credit risk between the two peaks of Pillar I and between Pillar I and Pillar II. There is a European-wide opportunity to get these right with Solvency II, but preliminary signs appear not to be favouring a market consistent approach.

The author defines insurance risks widely in ¶3.1.1, and again in Section 11. It is clear that he includes financial guarantees under this heading. In the FSA's risk classification, insurance risk is rather more restricted. Mainly, it refers to the uncertainty around the claims frequency and size in both life and non-life insurance. For life insurers, mainly this relates to mortality, including longevity and morbidity risks. In addition, persistency risk is typically included here, being more akin to a decrement outside the insurer's control than to an error-type operational risk, although it can have elements of both.

I agree with the author that expense risk is probably misclassified, although inflationary elements of expense risk are more akin to market risk than to operational risk.

I fully endorse the author's suggestion, in ¶11.2.5, that the broad risk of increased population longevity cannot easily be accommodated by either insurers or pension funds, and that it must be absorbed by the population as a whole, possibly by the rather politically unwelcome increases in retirement age. Insurers can then restrict themselves to the individual risk of outliving or predeceasing the norm, and pensions funds to encouraging savings.

Turning to the vexatious question of defining the risk free rate, I have to confess to having had something to do with the GN45 definition referred to in the paper, which is generally closer to gilts than to swaps. Perhaps there was a little fence-sitting or, as I prefer to see it, astute committee chairmanship, in that definition. Nevertheless, it is good to see a new way of looking at the question, using the credit default swap pricing approach. I am sure that the group tasked in bringing GN45 to full due process this year and the small group looking at cross-discipline consistency will both be interested considerably.

**Mr I. J. Kenna, A.I.A.** (in a written contribution that was read to the meeting)**:** As stated in ¶2.3.1(a), fair valuation "is conceptually the most appropriate way to value assets and liabilities for solvency purposes." The question is whether one needs to value assets and liabilities for solvency purposes if there is no intention of winding up a pension scheme and securing the benefits with an insurance company.

One firm of consultants used to value liabilities on an ongoing notional discontinuance basis, in order to obtain a recommended funding rate. In order to provide an acceptable answer to the customer, he used to be offered a choice of funding rates based on nil, 3% and 5% notional pre-award escalation of benefits.

Market values of unmarketable liabilities are subjective. Market values of assets are volatile, depending upon supply and demand. Fair valuations are also likely to be volatile, and not particularly safe either.

An ongoing pension scheme consists, at a particular time, of a stream of payments in and a stream of payments out. These streams of income and expenditure may be valued at a consistent rate of interest, and any divergences picked up at the next valuation. There is, of course, no harm in doing a discontinuance valuation as well, in order to reassure the customer and the authorities. Equating liabilities to market values, however, is just about as reasonable as offering to extinguish a lump sum debt by a series of market related payments.

**Dr C. Keating** (a visitor): My first comment is that this is an Orwellian abuse of fair value. Fair value is defined in the paper as mark to market. This is not fair value. The value of an asset is not its market price, other than under very specific circumstances. The value of any asset is actually a function of its use.

In the course of the paper the author describes analysts as having asked for market valuations. This is not actually true. I chaired the European Federation of Financial Analysts' committee on methods and measures, which was the relevant body, and the body which replied to the Accounting Standards Committee at the time. We are in favour of fair value. That is motherhood and American pie. It is not mark to market. The fundamental difficulty which we had with mark to market is one which has been well known in financial economics and in economics, more generally, for at least 40 years — that is that we do not know the probability measure under which these prices are derived. The only thing which we know about the probability measure under which these prices are derived is that it results in the volatility of market prices, which we cannot explain in terms of fundamentals. That is genuinely problematic. In the area of derivatives it is not a problem, because we are using the same measure, and it is comparable. For this, see Harrison and Kreps and similar related literature, and perhaps you should be aware of a paper which was recently published by the London School of Economics by the Financial Markets Group, 'Marking to Market, Panacea or Pandora's Box' by Plantin, Sapra & Shin. Its abstract is as follows:

> "Financial institutions have been at the forefront of the debate on the controversial shift in international accounting standards from historical cost accounting to mark to market accounting. We show that the trade-offs at stake in this debate are far from one-sided. While the excessive conservatism in the historical cost regime leads to some inefficiencies, marking to market may lead to other types of inefficiencies by injecting artificial volatility that degrades the information value of prices and induces sub-optimal real decisions.
>
> We construct a framework that can weigh the pros and cons. We find that the damage done by marking to market is greatest when claims are: one, long lived; two, illiquid; and, three, senior.
>
> These are precisely the attributes of the key balance sheet items of banks and insurance companies." [to which I would add as an aside: "and also pension funds."] "Our results, therefore, shed light on why banks and insurance companies have been the most vocal opponents of the shift to marking to market."

I think that it is a paper which the profession would do well to read in detail.

**Mr T. J. Sheldon, F.I.A.:** I agree with much in the paper, in particular the progressive move away from time series based risk models towards market consistent or fair value based risk models, which has arguably already taken place for U.K. life offices. After reading Section 6, it was difficult not to conclude that the drawbacks of the former types of models made their continued application almost untenable. I liked, in particular, the analogy with CDOs in Section 9.

In ¶3.1.2 the author highlights various distinctions between operational risk, on the one hand, and external risks, such as market and credit risks, on the other hand. I wonder, though, whether the analysis, and this distinction, is quite so simple. As an example, two life assurance companies might have apparently identical exposure to, say, equity risk within their with-profits funds, in terms of equity backing ratios, the sector and geographical spread of the equities, and the nature and the level of guarantees in the funds. However, their ability to mitigate the market risk arising from their equity exposures depends on their respective operational structures and systems and controls. Their assessments of the amount of capital required to back this risk (and, for realistic basis life firms in the U.K., the cost of guarantees) depends on what credit, if any, is taken for prospective management actions. The efficacy of these actions depends on the systems and the controls in place and the decision processes within the companies. Therefore, it is important that companies assess the capital required, with and without allowance for

management actions, and also examine the implications of potential operational failures in systems and controls on the capital required. We should not forget that most corporate failures in the financial world have been caused by a failure in operational control happening at the same time as a significant exposure to market (or some other external) risk materialises.

At the beginning of Section 9 the question of whether a distinction between market and credit risk is sustainable in the context of the trend towards fair valuation is posed. While agreeing with much of the argument, there is still the question regarding own credit risk (that is, the credit risk of the writer of the liabilities), and how that is reflected, if at all, on a company's balance sheet. It is not much use devaluing the liabilities reported to a supervisor to allow for this risk, as explained elsewhere, but the existence of this risk and the ability to default does, of course, create an asset for the shareholders. There is the related point that the market value of any liability depends on the credit standing of the provider.

The discussion on tranching in relation to CDOs, in Section 9, is also relevant to the consideration of which, or whose, risks are being managed or hedged. In the life assurance context, we can distinguish between the effect of providing guarantees in a with-profits fund on the respective risks borne by policyholders and shareholders in a proprietary company, where, in the usual case, the risk and reward structures for the policyholders and shareholders are not perfectly aligned.

Paragraph 9.6.2 draws a parallel between the ICA (see ¶9.5.2) and the market (or credit) spread on the policyholder liabilities tranche of a CDO. There is, though, a distinction between the confidence level set in the ICA, typically 99.5% over one year, or rather its resulting default rate of 0.5% over one year, and the market spread of $x$% p.a. on a CDO tranche. The relationship between the two figures is difficult to reconcile, and has yet to be explained satisfactorily.

**Mr A. D. Smith:** I want to pick up a point which several previous speakers have made. If I understood them correctly, they were arguing that, instead of basing risk management on a market value framework, one could, instead, base it on an intrinsic or true value framework. I think that it is worth exploring what that would entail. From the examples given, I would understand that true value is what the market value is supposed to revert to, so, perhaps, you could interpret true value as, for example, next year's market price.

I was intrigued by Mr Lewin's risk reduction proposal of buying things where next year's market price is higher than the current market price, and selling things where next year's market price is lower than the current market price. I have to say that it is hard to argue that that does not reduce risk. The only trouble, of course, is finding the reliable arbiter of next year's market price today.

I face a similar issue when working with economic scenario generators. Quite often I visit clients and I will show them how the market consistent generator works: "You put the market prices in, and out come simulations of future yields, future equity returns, property returns, credit spreads, and so on." Very often the client will say: "I have my own view as to how those things ought to move. Although your market-based model says that interest rates are going to do this, I think that they are going to do that. Can you put that into your model?" The answer to that is that technically you can, but it is no longer any use as a risk reduction tool or as a risk management tool. All that it is doing is telling your fund managers that they have invested wisely, and the basis for that conclusion is that you have asked them how they should invest, and then you have asked them how they actually invested, and, provided that they are sensible enough to get those two in line, your model gives them a great commendation. So, intriguing as the idea of managing risk on the basis of intrinsic or true value is, I am a bit sceptical as to how well that could actually work in practice.

The thought, in Section 7, about capital adequacy and the suggestion that, instead of looking at historically based percentiles for setting capital adequacy for financial institutions, one might, instead, look at distributions from implied option prices, and so on, intrigued me, and seemed to be new. To me it has some attraction, not least avoiding some of the rather long and protracted debates which we have about interpreting historic numbers, and the temptation to select periods which give a particular set of numbers.

However, that would also give some practical issues. If implied volatilities rise on the day before you have to do your capital measurements, then your capital requirements will also rise, which is not necessarily an unrealistic or an unreasonable thing, but it certainly would create new management challenges, which are probably more difficult than some of the ones with which they now have to deal. So, it is an adventurous modelling idea, and I hope that the author or somebody else will explore that further, because I think that it has something in it.

**Mr S. Creedon, F.I.A.:** I am pleased to see a paper which is broad in the scope of its application, and is not in any way limited to our traditional fields. Equally, I believe that the discussion has shown why the work needs to be taken on. I think that the paper is a start, rather than by any means a conclusion, and that there is a good deal of work to do.

I shall comment on three particular issues of which I have some knowledge: one is the fair versus intrinsic value controversy; then, taking that on into the Solvency II context, in which I am involved with the Groupe Consultatif's activities; and commenting on the implications for the Actuarial Profession or for us as professionals.

The fair versus intrinsic value controversy has crept into the discussion. It is the 'versus' which is the problem. The points which Mr Lewin made are well supported by the work of Robert Schiller (Schiller, 1989, 2000), for example, but the issue is: "How actionable is one's view of the difference between fair and intrinsic values?" I would like to know, for example, the relative values, fair and intrinsic, of the current English housing market.

The analogy which I think of here is that of playing poker. In playing poker, knowing the frequencies of all the various combinations of hands does not guarantee that you will win, but not having a clue as to the relative frequencies of the various combinations is likely to guarantee that you will lose. The same applies to knowledge of the techniques described in the paper.

Taking the debate on into the Solvency II context, which Mr Kipling mentioned, there is quite a lot of controversy underlying what should be the philosophy of Solvency II. The implication that it should be fair valuation based, with capital requirements along the lines which the author suggests, is by no means a universal view. There are at least two main issues. One is the level of technical provisions, or reserves, for want of a better word, where there is a polarisation between the Anglo-Saxon majority actuarial profession view, which is to favour International Financial Reporting Standards (IFRS) based balance sheets, and a view which emanates mainly out of Continental Europe, but also from many of the major insurers, which is for something which is not IFRS-based, but perhaps more like the Australian system based on a probability of sufficiency, say 75%, to determine provisions.

A similar debate exists in relation to what the author alludes to as Pillar I versus Pillar II. I shall certainly oversimplify this, but the battle lines tend to be between those who advocate a comprehensive and well harmonised Pillar I regime as the main determinant of capital requirements, and these, again, tend to be the continental insurers and perhaps those with a relatively low trust of the supervisory capacity, and those in the other camp (in which I think I number myself and many other actuaries), who believe in a diverse approach to the determination of capital requirements. There is no single, magical approach. A diversity of internal models is desirable, and, necessarily, is to be carried out within the Pillar II context.

These are issues for the Actuarial Profession, individual actuaries, and individual risk managers. The paper is an excellent, if not necessarily intended, response to Sir Derek Morris's recent strictures, reminding us that we are at a crossroads, and that we could fall back or could move forward. The author is definitely in the moving forward into a broader range of applications camp. How to do this is an issue of international debate, which is worth mentioning for those who might not otherwise be aware that the profession is actively engaged with the issue of broadening its approach to the risk management field internationally. There have been two principal developments which are happening in parallel, and which are described in detail in the March 2005 issue of the Risk Management Section Newsletter of the Society of Actuaries (Gilbert, 2005; MacGinnite, 2005).

Very broadly, the International Actuarial Association is contemplating — I am not sure that it has been agreed yet — organising risk management as a section within its activities, and, at the

same time, a number of universities in various countries in North America and Europe are promoting an international enterprise risk management institute. Again it would be oversimplifying, but you could characterise the debate as: "Is risk management a subset or a superset of actuarial activity?" These are certainly debates and issues in which many more actuaries should be getting involved.

## References

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**The President (Mr M. A. Pomery, F.I.A.):** I shall make some comments on Section 4.6, regarding the implications of fair valuation for DB pension schemes, which is one of the points which the author mentioned in his opening remarks.

I think that the analysis in Section 4.6 is extremely valuable for pensions actuaries, and it is to be hoped that, through their advice, it will eventually prove useful for trustees of pension schemes and ultimately for the members of schemes themselves.

It is quite clear that the advent of very serious deficits on a winding up, discontinuance or buyout basis, whatever terminology you use, which has arisen through the very sharp fall in real long-term interest rates and increasing longevity, and is therefore not likely to go away in the future, is giving rise to new thinking about the nature of those deficits. As the author says: "Are they, in effect, a loan from the scheme to the sponsoring employer?"

This, in turn, is radically changing the issues which pension scheme trustees, and therefore their advisers, are having to address. Purchasing credit protection, as suggested in ¶4.6.3, seems certain to become one of the main avenues to be explored in the future.

What is less clear to me is what is likely to be the impact of the Pension Protection Fund (PPF) on these considerations. The PPF provides a substantial degree of protection to members in the event of employer insolvency, but it also leaves significant gaps. Members' benefits are only 90% covered; there are serious gaps in the inflation proofing provisions; and there is an overall cap of £25,000 p.a. on the pension covered by the PPF.

The question in my mind is: "Will trustees feel that there is a powerful need to cover 100% of the promised benefits in their scheme?" If that is so, then credit protection could assume an important role. Alternatively, will trustees feel that the PPF, which provides a Government specified level of protection, is sufficient and that they need to do no more?

My guess is that, initially, the PPF level will seem very satisfactory to trustees, because it is so much better than what existed there beforehand — or, to be more accurate, what did not exist beforehand. After a while, and it may not take very long, the step change which we had on 6 April 2005 will be taken for granted, it will be history, and more focus will be placed on the gaps in the PPF provision, particularly if inflation should pick up a bit. So, while there may be a temptation to ignore the ideas in Section 4.6 today, because of the advent of the PPF, I believe that it would be wrong to do so. I predict that pensions actuaries will need to be considering Section 4.6 before too long.

**Mr D. C. E. Wilson, F.I.A.** (closing the discussion)**:** I have been intrigued by the profession's push into the supposedly new field of 'risk management' in recent years, as I have always thought that financial risk management is exactly what actuaries do. Maybe there is an echo of Mr Creedon's question about subset or superset here. The wide-ranging nature of the paper seems to bear me out — there are few areas of actuarial endeavour which are not touched on within the paper. However, the author rightly points out that it is not just actuaries who are involved in financial risk management. An important theme here (again brought out by

Mr Creedon) has been the extent to which actuaries are the most appropriate people for this work.

One area of focus was on the continuing theme of the difficulties with defining fair valuation itself, and the differences between that and intrinsic value or true value. While I have some sympathy with the comments of Mr Smith, I think that the use of next year's price to define true value was somewhat of a caricature. I do not think that that is what Mr Lewin said. It was, effectively, a value towards which it would be reverting at some point in the future. You cannot define the point or when it gets there, but you can have an idea about the direction in which it should be moving.

The paper points out that fair values can be complex to calculate and to understand, and that they involve computational subjectivity. I think that the discussion about the appropriate risk free rate is evidence of that. I was interested to see in the paper that the Danish regulator publishes daily a yield curve which can be used to discount so-called risk free liabilities, and to contrast that with the approach taken by our own regulator, which says that it is up to us.

Whatever our views on the relative merits of fair values and intrinsic values, I like the analogy of Mr Creedon regarding poker hands, which I interpreted as being a statement that we cannot just use market prices.

As was pointed out by Dr Keating, we should not underestimate the difficulties in defining the fair value, nor, indeed, the potential that using fair value has to create market failure, such as inefficient capital allocation. Nevertheless, the scope for fair values to improve understanding and risk management is amply demonstrated by the example balance sheets for a DB pension scheme in Section 4.3. Mr White's comment about their use in debunking self-deception and misleading accounting is very relevant in this context, and also the idea that they would help us to identify the so-called derivatives' black hole.

Mr Sheldon also pointed out the benefits of using fair value based risk approaches over time series models. I do not think that anybody spoke against that. I certainly would support that comment.

The suggestion, in Section 4.6, for DB trustees to purchase credit protection on the scheme sponsor is an interesting one (and drew comment from the opener and from the President). Theoretically, this seems entirely sensible. In theory, this should have little effect on financial markets, as, in a fair value world, market participants should already be allowing for the effective debt created by the pension scheme on the sponsor. If markets were perfect (which, of course, they are not), the only impact of the suggested CDS strategy would be due to any change in priority order on insolvency, as discussed in the paper.

However, in the real world, companies with positive net fair value can be forced out of business by liquidity problems. Any strategy which makes it harder for the sponsor to raise debt, as this has the potential of doing, can have a negative value.

I am also interested in the signalling effect that it might have on markets if trustees were to do this, and what such a move might do, in practice, to the relationship and trust between trustees and sponsors. There is a complex co-dependency here, which is recognised in the paper. In the language of Section 9, the sponsoring company could be considered as providing the equity tranche of a CDO representing the pension scheme. Hence, the existence and the size of this equity tranche must make a difference to the security of the scheme benefits.

I was also interested in the President's comments about what impact the advent of the PPF might have on the action taken by trustees, and whether or not this might just effectively delay the use of a CDS strategy by them.

I agree with the paper (and the opener) about the blurring of boundaries between different types of risk. For example, in different situations, movements in credit spreads might be thought of as reflecting market risk or credit risk. I also strongly agree with the criticisms of the RCM credit test in the new insurance regulations. This test is clearly inconsistent with that applied for equities, for example, some longer-dated or lower-rated bonds can attract a higher capital requirement than equity; unlike equity there is no mean reversion built into the test or recognition of the 'pull to par'; the test is much more granular than equity for spurious accuracy. Overall, the test is a strong incentive for regulatory arbitrage, as implied in the paper.

Mr Kipling suggested that Solvency II gave an opportunity to revisit this, but other speakers suggested that the signs are not good, and that we are going to end up there with a test which is not market consistent. Other speakers spoke about the importance of expense risk and the importance of systems and controls in helping with management actions, and, therefore, effectively the link with operational risk within the business.

As a member of the Finance and Investment Board, who has paid a lot of attention to statements made by the Pensions Commission, I feel that I must comment on the suggestion made at the end of the section on insurance risk regarding experience rating of cohorts of annuitants, which was also referred to by Mr Kipling. This is very much in tune with the thinking presented by Adair Turner in a recent lecture at the Cass Business School. What seems to be less well recognised is that products which achieve this are already in existence. One annuity provider sells a unit-linked product which pools longevity risk within cohorts, while with-profits annuities which pool longevity and investment risk across cohorts have existed for many years. The relative pricing of with-profits and guaranteed annuities shows clearly how risky the industry believes the latter to be.

I finish where I began, with a thought on what all this means for actuaries in risk management. As the paper concludes, one of the key requirements for successful risk management is a healthy dose of pragmatism. Appropriate use of pragmatism requires a good understanding of the dynamics of the business, probably borne from many years of experience. For long-term financial institutions, such as insurance companies and pension funds, who is better placed to provide this than actuaries?

**Mr M. H. D. Kemp, F.I.A.** (replying)**:** Thank you very much to all of those who contributed to the discussion. As those of you who have been involved in writing sessional meeting papers will know, the subjects which you think are important are not necessarily the ones which the audience thinks are important. Thank you for providing some ideas and insights which were different from the ones which I had.

Much of the discussion was spent on the topic of fair valuation versus intrinsic valuation. There is a presupposition within the paper that we are heading towards a fair valuation world. If this proves not to be true, then, clearly, a number of the themes which are explored in the paper become more suspect.

However, it seems to me to be important to remember, particularly in the context of capital adequacy, that fair valuation techniques have particular lessons for what happens when you *cannot* do what you originally hoped to be able to do. Someone raised an example, during the discussion, of a pension scheme arguing that it was not going to wind up, or an insurance company which says that it was not going to go bust, giving such entities flexibility to deviate from fair value approaches. However, what if they are forced to do otherwise? Will they still then actually have enough capital?

I also found the discussion around a pension scheme's credit exposure to its sponsoring employer interesting. I suspect that we will hear more on this topic in the coming months. I agree with the President that people may, perhaps, first look to the PPF and try to work out whether or not it will provide a suitable level of cover, and it will be interesting to see how thinking develops over the longer term. Markets innovate, and actuaries need to keep up with that innovation.

**The President (Mr M. A. Pomery, F.I.A.):** It remains for me to express my own thanks, and I am sure the thanks of all us, to the author, to the opener and to the closer, and to all of you who participated. It was a particular pleasure for me to have this paper during my Presidency, as the author began his actuarial career as a colleague of mine many years ago.

I ask you to join me in thanking all those who contributed, but especially the author.