

INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

11th November 2008

Subject CA3 – Communications

Time allowed: 3 Hours (14.15 - 17.30 Hrs)

Total Marks: 100

INSTRUCTIONS TO THE CANDIDATES

- 1. Please read the instructions on the front page of answer booklet and instructions to examinees sent along with hall ticket carefully and follow without exception*
- 2. You have 15 minutes at the start of the examination in which to read the questions. You are strongly encouraged to use this time for reading only, but notes may be made. You then have 3 hours to complete the paper.*
- 3. You must not start writing your answers until instructed to do so by the Supervisor.*
- 4. Attempt BOTH the questions.*
- 5. Mark allocations are shown in brackets.*

AT THE END OF THE EXAMINATION

Please return your answer book and this question paper to the supervisor separately.

- Q.1)** You work as a consulting actuary in an actuarial consulting firm. Your client, a trustee for a pension fund, has passed you the following article.
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Investment banks are not the only ones to have messed up in the recent financial crises, though risk managers from some retail institutions are scathing about them. “Investment bankers who talk about ‘exploding short-term gamma risk’ earn \$2m; someone in our debt-recovery team earns \$50,000,” spits one retail banker. “The only difference between them is that the person who earns \$50,000 knows what he is doing.” In fact, bad decision-making did not respect sectoral boundaries: witness Northern Rock’s fatal reliance on the wholesale funding markets.

Whatever the type of institution, it is clear that the quality of risk management can make a very big difference to its performance. However the risk managers are also aware that they are having to base their decisions on imperfect information. The crisis has underlined not just their importance but also their weaknesses.

Take value-at-risk (VAR), which puts a number on the maximum amount of money a bank can expect to lose. VAR is a staple of the risk-management toolkit and is embedded in the new Basel 2 regime on capital adequacy. The trouble is that it is well-nigh useless at predicting catastrophe.

VAR typically estimates how bad things could get using data from the preceding three or four years, so it gets more sanguine the longer things go smoothly. Yet common sense suggests that the risk of a blow-up will increase, not diminish, the farther away one gets from the last one. In other words, VAR is programmed to instil complacency. Moreover, it acts as yet another amplifier when trouble does hit. Episodes of volatility send VAR spiking upwards, which triggers moves to sell, creating further volatility.

The second problem is that VAR captures how bad things can get say 99% of the time, but the real trouble is caused by the outlying 1%, the “long tail” of risk. VAR leads to the illusion that you can quantify all risks and therefore regulate them.

Models still have their place: optimists expect them to be greatly improved now that a big crisis has helpfully provided loads of new data on stressed markets. Even so, there is now likely to be more emphasis on non-statistical ways of thinking about risk. That means being more rigorous about imagining what could go wrong and thinking through the effects. House prices in America may not have declined nationally since the 1930s, for example, but the better risk managers still developed models that assumed a drop.

However, stress-testing has imperfections of its own. For example, it can lead to lots of pointless discussions about the plausibility of particular scenarios. Some think it is better to start from a given loss and then work backwards to think about what events might lead to that kind of hit.

Nor is stress-testing fail-safe. The unexpected, by definition, cannot be anticipated: until last summer, for instance, banks would have said that in the event of a liquidity crisis they could

raise emergency funding through securitisation. But a qualitative approach is an essential complement to a quantitative one.

Another big challenge for risk managers lies in the treatment of innovative products. New products do not just lack the historic data that feed models. They often also sit outside the central risk-management machinery, being run by people on individual spreadsheets until demand for them is proven. That makes it impossible to get an accurate picture of aggregate risk, even if individual risks are being managed well. “We have all the leaves on the tree but not the tree,” is the mournful summary of one risk manager.

However, working out the size of the risks is less easy than it used to be. For one thing, the lines between different types of risk have become hopelessly blurred. Risk-management teams at banks have traditionally been divided into watertight compartments, with some people worrying about credit risk (the chances of default on loans, say), others about market risk (such as sudden price movements) and yet others about operational risks such as IT failures or rogue traders.

The crisis has rung the death-knell for that approach. You need to have ways of cutting across the books and having aggregate limits scaled across all risk categories.

Another problem was that variations in the quality of risk management among different institutions became clear only when disaster struck. Senior executives privately admit that it is extremely difficult for shareholders to see inside institutions and work out just how well they manage their risks. Regulators also confess to difficulties, particularly when it comes to unscrambling the most complex models.

A source of additional uncertainty is the advent of fair-value accounting, which requires banks to mark the value of their traded assets to market prices. That is fine when markets are highly liquid, but in their search for yield the banks had been actively seeking out less liquid assets. When markets dry up, price discovery becomes difficult. Institutions are forced to use proxies such as indices to determine a price, which may not accurately reflect the composition of their own assets or which may become oversold. When such proxies are unavailable, the valuation process becomes a matter of judgment (or worse, of manipulation: an embarrassing restatement of earnings by the hitherto solid Credit Suisse in March was due partially to intentional mismarking by a few traders).

There is an even bigger concern. Everyone is ready to listen to risk managers now, but the message is harder to transmit when the going is good. “Come the next boom we will have traders saying, ‘that was eight months ago. Why are you dragging me down with all that?’,” sighs one risk chief. To improve risk management through the cycle, deeper change is needed.

Your client does not understand the technical aspects covered in the article and has asked you to prepare a memorandum on risk management covering the following aspects:

- Value at risk and its drawbacks
- The need for risk management to include qualitative assessments
- Dealing with new products
- Implications of fair value accounting

Draft a memorandum in about 500 – 600 words in response to the client’s request. You can assume that the information contained in the article is correct and that no further information is required.

[60]

- Q.2)** Your friend has read the following note from a person who works in the actuarial department of a life insurer and your friend is unable to understand the concepts explained

“Embedded values

This is a metric used for placing a value on the shareholders’ interest in a life insurance company. However, it restricts itself to only a consideration of the existing business that the insurer has and places no value on business yet to be written.

The embedded value comprises the additive sum of the adjusted net worth and the value of in-force business. The starting point for the adjusted net worth calculation is the net assets as disclosed in the balance sheet. The balance sheet figure however is not usually on a market value basis as in many countries assets are held on other bases commonly historic cost or amortized cost. Therefore an adjustment needs to be carried out to bring the assets onto a market value basis.

The value of the in-force business is arrived at by computing the cash flows to the shareholder based on best estimate assumptions regarding the various elements of the future experience in terms of investment return, expenses, mortality rates and rates of surrender. The present value is then derived by discounting these at a risk discount rate with the present value arrived at being the value of in-force business. The risk discount rate is chosen having regard to the uncertainty of the shareholder cash flows arrived at using the above methodology.

The above approach to computing embedded values has come in for a lot of criticism as the methodology is not consistent with the way the market values cash flows. A particular criticism has been that the value is not indifferent to the choice of assets that the insurer invests in and can be increased by investing in riskier assets. This arises as for riskier assets expected returns which are used for best estimate assumptions are higher while the discount rate stays the same thus resulting in an increase in value. This is inconsistent with a methodology attuned to the market as the higher expected return for a riskier asset is due to the greater risk borne by the investor and does not signal in itself greater value.

In addition the above methodology does not value guarantees in a correct manner. If under the best estimate assumptions the guarantee does not come into play then no value is ascribed to it. This is contrary to the way that financial markets value guarantees which depend amongst other things on the uncertainty and variability of future returns.”

Redraft the note in about 450-550 words to make it suitable for sending it to your friend who is not conversant with financial matters. You can assume that the information contained in the note is correct and that no further information is required.

[40]
