Actuaries as risk managers

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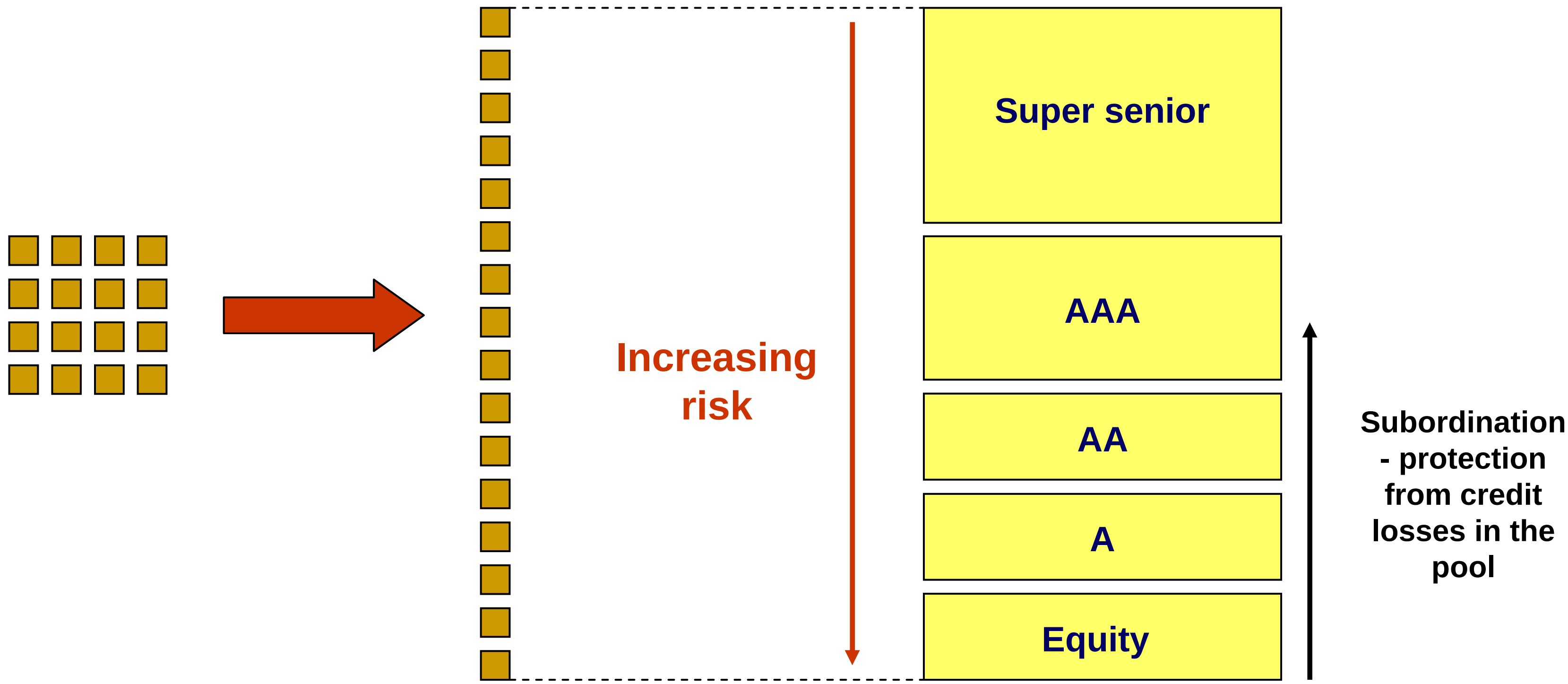
Dublin
15 April 2008

USA: the sub-prime crisis (1)

- Lending spree to individuals with poor credit histories
- Fuelled by high commission rates to intermediaries and low initial interest payments
- Loans securitised and sold on
- Estimated $1.3 trillion of sub-prime loans outstanding
- 1.8m loans will have interest rates reset in 2008

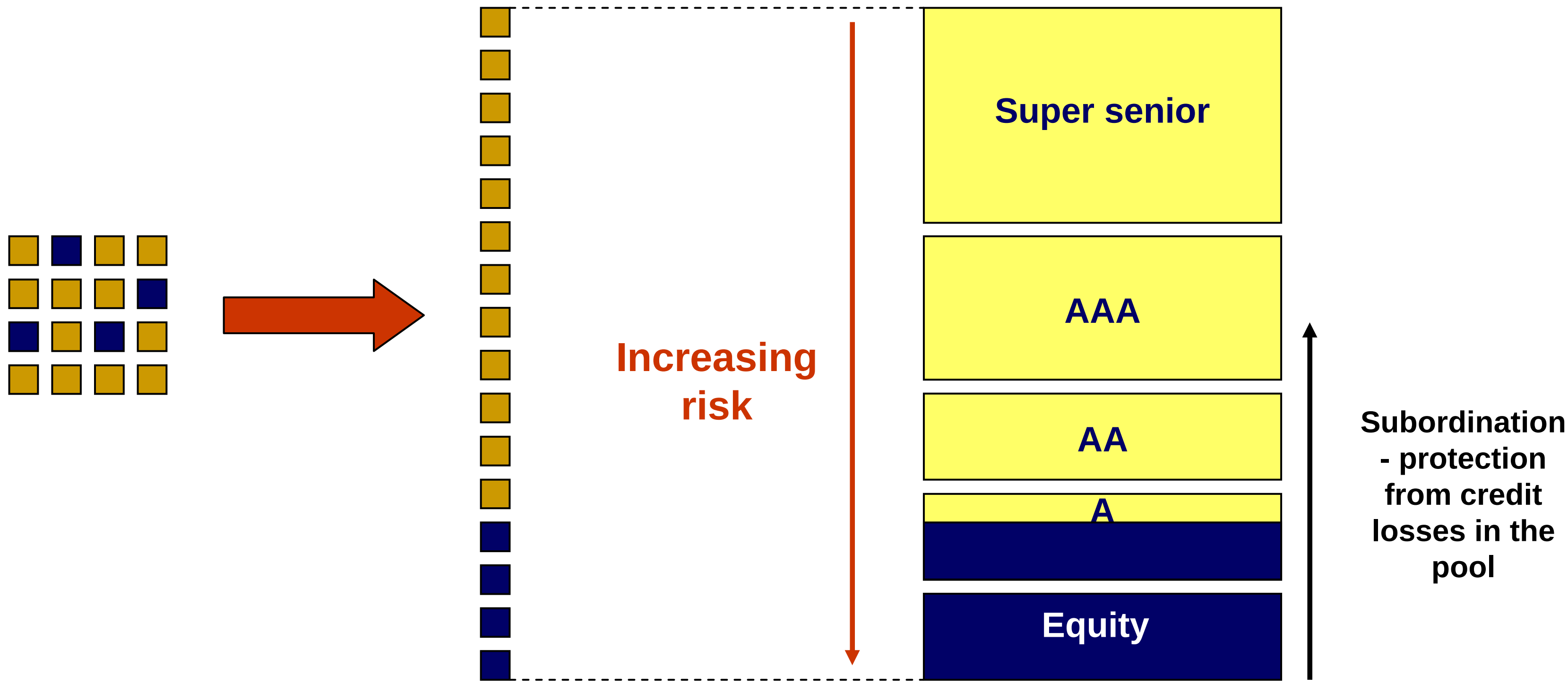
CDOs – how they work (1)



Pool of 16 credits **Credits arranged in hierarchy according to default sequence** **Tranches in the hierarchy can be selected and rated**

Source: Morgan Stanley

CDOs – how they work (2)



Default event

Default event affects lowest investor in hierarchy first

Equity investor pays for any credit losses up to its principal amount, then A-rated bond impaired

Source: Morgan Stanley

USA: the sub-prime crisis (2)

- Exposure (direct and indirect) to sub-prime mortgages has so far caused over $200bn of losses for banks worldwide, and the IMF has estimated that the total could reach $510bn, with the rest of the financial sector bearing a similar level of losses
- Many large banks have had to seek additional capital, mainly from SWFs, to maintain ratings
- Over 2,000 rating downgrades of Collateralised Debt Obligations since 1 January 2008

Citi secures further $14bn

Bulk of the money to come from China

Capital-raising effort second in two months

By Henny Sender in New York

Citigroup is putting the final touches to its second major capital-raising effort in as many months, seeking up to $14bn (£7bn) from Chinese, Kuwaiti and public market investors, people familiar with the negotiations say.

Under the proposal being discussed, the bulk of the money – about $9bn – would come from China. The Kuwait Investment Authority would contribute about $1bn, while $2bn to $4bn would be raised through a public placement of shares. The formula is still being adjusted and there could be last-minute changes, the people involved say.

The deal underscores the depth of the problems faced by big banks, which suffered heavy losses in the US subprime mortgage crisis. It would follow an injection of $7.5bn into Citigroup by the Abu Dhabi Investment Authority in late November.

"The second round is going very well, because Citi is seen as US Inc," says the regional head of a US investment bank in the Middle East. Citi declined to comment.

As more US financial institutions raise capital from foreign sources, largely from sovereign wealth funds, there is also a growing debate about the potential domestic political reaction, particularly during a presidential election year.

The deal would mark the first time that the KIA has invested in an ailing US financial institution. KIA, which is known as a conservative investor, is taking a portfolio approach to the US financial crisis, looking to buy small stakes in many troubled financial firms rather than putting a large chunk of money in one bank.

Staff at the KIA could not be reached for comment.

The deal highlights China's growing importance as an exporter of capital. The Chinese government has emphasised a policy of investing abroad to keep the ample liquidity in China from feeding a bubble in shares and property.

"They want to recycle money as there is too much in China," says Fred Hu, a China-based managing director at Goldman Sachs. "Because of capital controls, only the government can take the money and put it offshore."

The Chinese party in the Citigroup deal is probably a bank such as the Industrial and Commercial Bank of China, or China Development Bank, or an investment arm of the government. However, the distinction between government and quasi-private money is often blurred in China.

Potential Chinese investors also include China Investment Corporation, which has been mandated by the government to invest China's burgeoning reserves abroad and recently injected $5bn to Morgan Stanley.

China's State Administration of Foreign Exchange, or Safe, also invests directly offshore. The Development Bank of China, which is not listed, has taken stakes in financial institutions such as Barclays. ICBC is a listed company, which is supposed to be managed in the interests of its shareholders, which include the government.

Citi's capital-raising structure differs from the first round. That involved a complex security that converts into Citi shares and pays an 11 per cent coupon.

US banks get $21bn foreign bail-out

UK: Northern Rock

- Northern Rock is a UK mortgage lender which relied heavily on wholesale markets for funding
- In September 2007 a severe liquidity squeeze caused by the sub-prime crisis led the bank to seek emergency funding from the Bank of England
- News of this caused a run on the bank (the first in the UK for over 100 years) until the UK government stepped in to guarantee deposits
- Attempts to find a private sector buyer failed and Northern Rock has now been nationalised

Rock sale less than even chance

Government steps up pressure for a decision

Shareholders must choose – and quickly

USA: Goldman Sachs

- In a rare unplanned investor call, the bank revealed that a flagship global equity fund had lost over 30 per cent of its value in a week because of problems with its trading strategies created by computer models. In particular, the computers had failed to foresee recent market movements to such a degree that they labelled them a “25-standard deviation event” – something that only happens once every 100,000 years or more.

- “We are seeing things that were 25-standard deviation events, several days in a row,” said David Viniar, Goldman’s chief financial officer.

- “People say these are one-in-a-100,000-years events but they seem to happen every year,” says Satyajit Das, a consultant to hedge funds and investment banks. “This episode should make people ask questions about models – I think it could lead to a real reassessment.”

Monoline insurers

- Monolines are insurers which guarantee or “wrap” bonds issued by weaker institutions, to improve their credit rating and thereby reduce borrowing costs
- Exposure to mortgage-backed securities threatened the AAA credit rating of some monolines, leading to potential downgrades of the bonds they have guaranteed
- Some capital raising/restructuring has eased the position, but “negative outlook” remains

Banks act over monoline crisis

Citigroup and Barclays in move to boost Ambac

Other bond insurers may also be bailed out

By David Wighton, Aline van Duyn and Henny Sender in New York and Peter Thal Larsen in London

Leading US and European banks are joining forces to find solutions to the crisis among US bond insurers, whose problems threaten to exacerbate the impact of the credit squeeze.

One group of banks, including Citigroup and Barclays, is examining options for supporting Ambac Financial, one of the leading monoline insurers. Separate teams are working with other bond insurers, according to people close to the process.

The moves come after efforts by Eric Dinallo, New York state insurance superintendent, to persuade the banks to back an industry-wide bail-out for the beleaguered guarantors.

John Thain, chief executive of Merrill Lynch, told the Financial Times that such an industry-wide solution would be “hard to get” given the banks' different exposures to the credit insurers. But Mr Dinallo's initiative has spurred the banks to look at supporting the insurers on an individual basis.

Moody's Investors Service and Standard & Poor's, the biggest credit rating agencies, have warned that they may cut the triple-A ratings of Ambac and MBIA. This would force banks to make further writedowns or provide more capital against investments insured by the guarantors.

The group of banks looking at supporting Ambac includes Citigroup, Wachovia, Barclays, Royal Bank of Scotland, Société Générale, BNP Paribas, UBS and Dresdner. The group is being advised by Greenhill while Credit Suisse is advising Ambac.

Ambac, which has been stripped of its triple-A rating by Fitch, needs to raise $1bn, according to analysts. Uncertainty about whether Ambac and MBIA can find new capital in time to avoid losing their triple-A ratings has weighed on sentiment in the equity markets.

A report this week by Oppenheimer said extra writedowns for banks following credit ratings could range for $40bn to $70bn.

Time is running out for the bond insurers. Moody's said this week it would complete a review of the bond insurance industry by late February as it tries to determine how much more capital bond insurers need to account for rising losses from subprime mortgage securities.

Shares in the bond insurers rose yesterday on the news that banks were considering injecting cash into Ambac, first reported by CNBC.

By the close in New York, Ambac was up 13.4 per cent to $13.20, and MBIA was up 5.55 per cent to $16.36.

Both companies have seen their share prices fall by nearly 80 per cent in the past 12 months.

www.ft.com/monolines

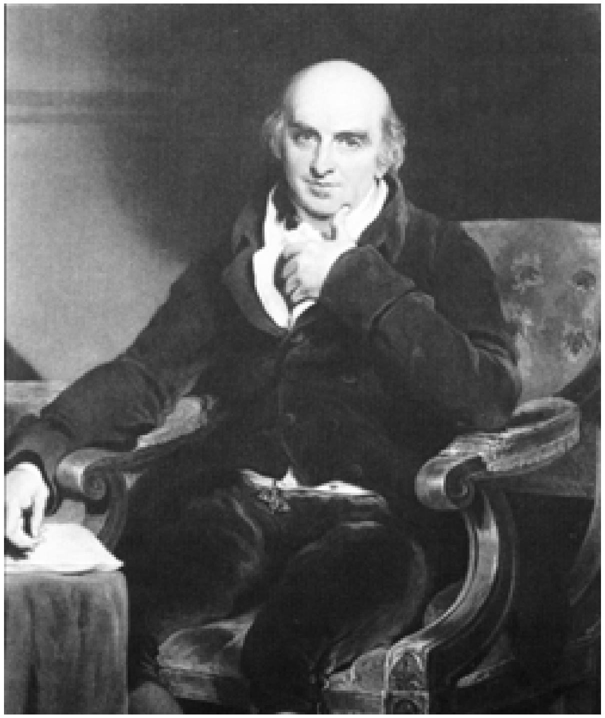
France: Société Générale

- Futures trader Jérôme Kerviel built up €50bn exposure to world equity markets by creating a fictitious offsetting portfolio and bypassing control systems
- By the time the exposure had been closed out, losses of €4.9bn had been incurred


£3.6bn rogue 'behind crash'

UK: Equitable Life

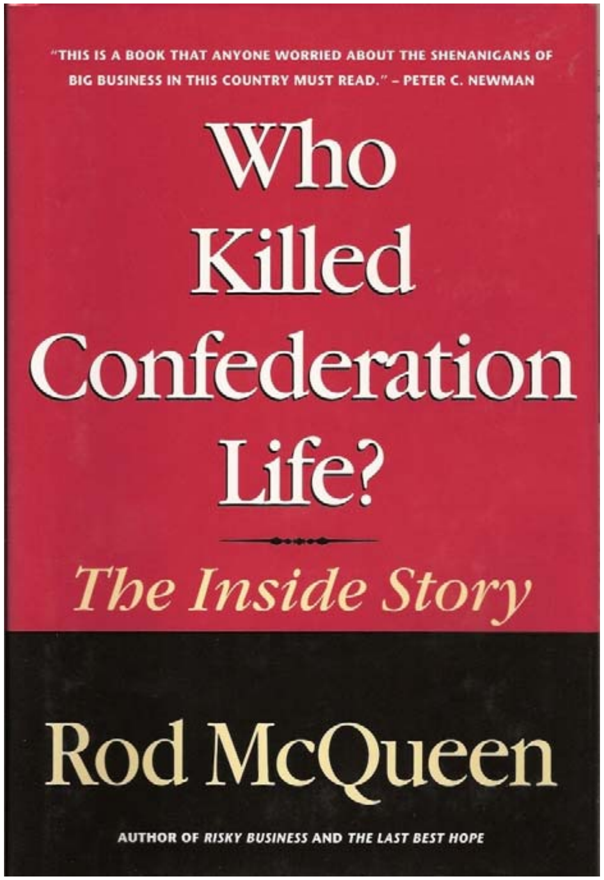
- World's oldest mutual life assurer – founded 1762
- Invented participating life insurance
- Ran into serious financial difficulties in 2000 as a result of generous guarantees and falling interest rates, exacerbated by loss of court case
- Closed to new business, but has remained solvent



Dr William Morgan
(Chief Actuary 1775 – 1830)

Canada: Confederation Life

- Largest life insurance company failure in North America
- Started 1990s with 75% of assets in real estate and mortgages
- S&P downgraded from A+ to BBB+ one week before liquidators took over in August 1994, having been AAA until January 1992



Australia: HIH

- Australia's second largest P&C insurer
- Became insolvent in March 2001
- Losses up to $5.3 bn – Australia's largest ever corporate collapse
- Multiple causes including culture/ uncontrolled expansion/ underpricing/ inadequate reserves/ weak auditors
- Directors jailed for fraud/insider dealing

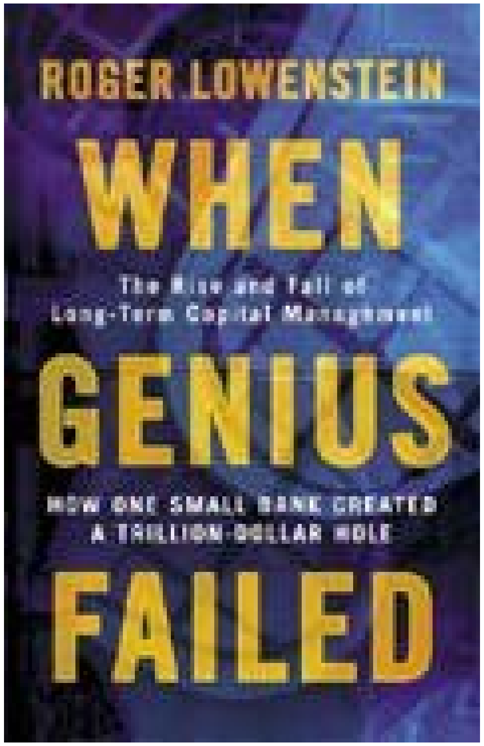
Former HIH CEO Ray Williams on his release from jail

UK: Independent Insurance

- Major UK P&C insurer
- Grew rapidly after formation in 1986 and was listed in 1993
- Became insolvent in 2001 after company revealed large numbers of claims that had been concealed
- CEO Michael Bright jailed for 7 years in 2007

USA: Long Term Capital Management

- Hedge fund used sophisticated models to exploit anomalies in bond and stock prices
- Highly leveraged, based on very favourable borrowing terms
- Built up large exposures to swap spreads and equity volatility
- Failed spectacularly when Russian debt crisis caused turmoil in financial markets
- Bailed out by creditor banks to avert financial crisis



Japan: benefits cut to facilitate restructuring of failing companies

- Between 1976 and 1993, individual life policies typically guaranteed accumulation rates of around 5.5% per annum
- Interest rates fell sharply in late 1990s and exposed guarantees
- Seven life companies became insolvent between 1997 and 2001, but were restructured and sold without ceasing trading

Japan: restructuring approach

- Assets marked to market
- Reserves zillmerised
- Reserve haircut of up to 10%
- Benefits recalculated at lower prospective guaranteed rates
- Moratorium surrender charge imposed

Old name	New name
Nissan Mutual	Aoba Life
Toho Mutual	GE Edison Life
Daihyaku Mutual	Manulife Century
Taisho Life	Azami Life
Chiyoda Mutual	AIG Star Life
Kyŏei Life	Gibraltar Life
Tokyo Mutual	T&D Financial

Jamaica: financial meltdown

- In 1995, short term interest rates in Jamaica reached 50% p.a.
- Most bank and insurance products were deposit-like, but funds were invested in illiquid assets, particularly real estate developments
- Companies approached government in 1996 and were bailed out at a cost of 40% of GDP

What went wrong? – a summary

	Market	Credit	Liquidity	Insurance	Operational	Group
Confederation Life						
Equitable Life						
HIH						
Independent						
LTCM						
Northern Rock						
Japan						
Jamaica						

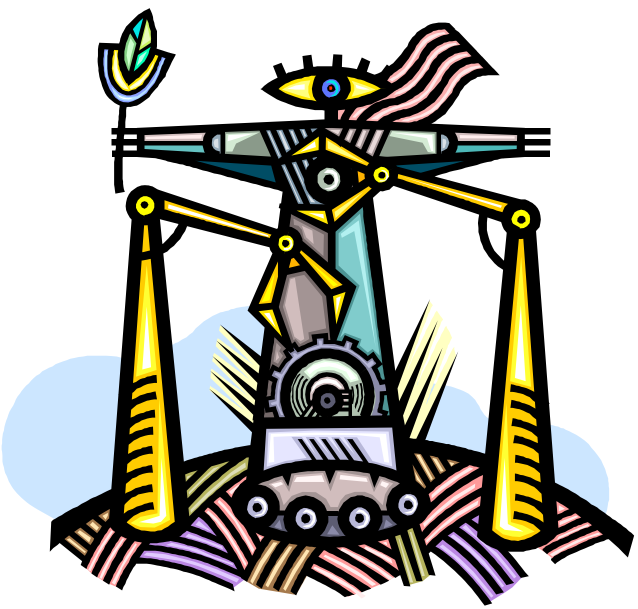
Solvency II reform in the EU

- Risk-based regulatory framework for all insurers based in EU
- Best estimate liability allowing for discretionary benefits, time value of guarantees/options and management actions, plus risk margin for non-hedgeable risks
- Risk based capital requirement based on 99.5% confidence level over 1 year for each risk, aggregated using correlation matrices
- Due for implementation in 2012
- Some regulators already adopting risk-based framework in advance, e.g. UK, Switzerland, Sweden

Solvency II will significantly change the insurance solvency system in Europe, and may influence developments elsewhere

Potential shortcomings of risk-based capital models

- Inadequate data to assess loss distributions
- Wishful thinking/choosing “affordable” assumptions
- Appropriateness of 1 year time horizon
- Modelling tail behaviour
- Reliance on past as a guide to the future
- Capturing new types of risk
- Results distorted by simplifications



The role of actuaries

- Rigorous analysis of data
- Improved modelling to understand dynamics of business
- Development of “killer scenarios” / “least solvent likely events”
- Standing back, questioning and challenging
- Clear communication to the decision-makers

Applies to all financial institutions, not just insurance companies

Views of one UK politician

"If we want to avoid these kinds of shocks in the future then we must empower actuaries to ensure that all boards of directors are fully acquainted with the doomsday scenario that could be around the corner"

"Actuaries should not be afraid to speak their minds about the risks being taken within the boardroom. On the contrary. They should be encouraged to make sure that directors are fully aware of the entire risk profile of the business."

John Greenway MP

"The only way…is to strengthen stress testing and build effective risk management plans. Actuaries have the skills, experience and expertise to fulfil this critical role."

What is the profession doing to help?

- Developing qualifications in Enterprise Risk Management
  - CERA
  - Planned global qualification
- Greater prominence in education syllabus generally
- Researching new techniques and refining existing ones
- Positioning actuaries as the natural choice for complex risk quantification work

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