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Classification of different risks

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Introduction

- Coherent risk classification is key to Enterprise Risk Management. Without it, there is scope for overlap and confusion as to which category a risk falls under and who ultimately is responsible.
- There are nearly as many classification systems as there are institutions engaged in ERM. This can complicate comparisons between institutions i.e. where the same risk is given two different titles; or the same title is given to two very different risks.
- The Risk Classification Working Party is looking to develop a standard classification system for the Profession which would act as a common reference point for discussion between Actuaries and hopefully remove the scope for confusion.
- The working party has sought as far as possible to break risks down into their components to identify demarcation issues.
- We would note that there is no perfect system of classification but hope this standard can facilitate comparison of risk frameworks, and that it may help underpin further research into risk.

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A multitude of risk classification systems

FSA categories

- The FSA's Systems and Controls handbook (SYSC) has sections covering the following risk types:
  - Market
  - Credit
  - Insurance – including Persistency and Expense Risks
  - Liquidity
  - Operational
  - Group Risk – relating to exposures to other parts of the financial services group to which a firm belongs
- Note there is no explicit section in SYSC dealing with strategy or reputation risks (though no doubt these would be covered as part of the ARROW process).

BaFin Minimum Risk Classification

- The German regulator expects to see firms' risk frameworks covering at a minimum:
  - Market
  - Credit
  - Underwriting – broadly akin to the FSA's Insurance Risk (?)
  - Liquidity
  - Operational
  - Concentration risk – relating to concentrations of exposure to individual counterparties
  - Strategy
  - Reputation
- It is worth noting the differences in how BaFin categorise risks relative to the FSA e.g. Concentration Risk is considered separately from Credit Risk.

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LBG Risk Categories

- From its 31st December 2009 Report and Accounts (p63), Lloyd's Banking Group's considered the following primary risk drivers:
  - Market
  - Credit
  - Insurance – including Persistency and Expense Risks insofar as they affect Insurance business
  - Operational
  - Financial Soundness – including Liquidity Risk as well as tax, accounting and regulatory capital issues
  - Business – broadly covering strategy-related risks

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Prudential's Risk Categories

- From its 31st December 2009 Report and Accounts (p41), Prudential's Enterprise Risk Management framework considered the following broad categories:
  - Market
  - Credit
  - Insurance – including Persistency and Expense Risks
  - Liquidity Risk
  - Operational
  - Business Environment Risk – relating to exposure to forces in the external environment that could significantly change the fundamentals that drive the business's overall objectives and strategy
  - Strategy – ineffective, inefficient or inadequate senior management processes for development and implementation of business strategy

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Confused ?

- Even at a high level, there is scope for confusion between different classification systems.
- However as one drills down to sub-categories, further confusion is possible. For instance one organisation may class failure of a project as Operational Risk, another may class it as Strategy Risk.
- Some other areas of doubt:
  - Should non-disclosure be considered as part of Insurance / Underwriting Risk or as an Operational (Fraud) Risk ?
  - Is spread widening of Corporate Bonds a Credit or a Market Risk ?
  - Is a shortage of buyers in a market a Liquidity or a Market Risk ?

  …this list is not exhaustive!
- Risk classification is a modern day Tower of Babel with firms each talking a different risk language, making comparison hazardous.

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Confused ?

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Proposed Standard
Risk Classification System

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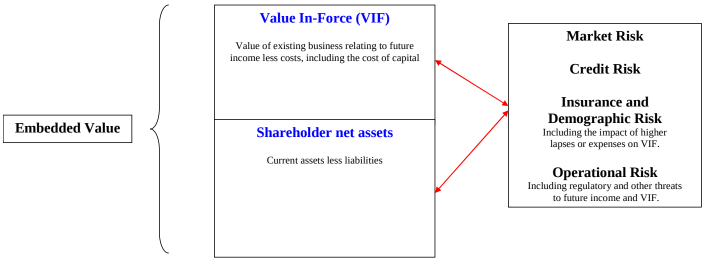
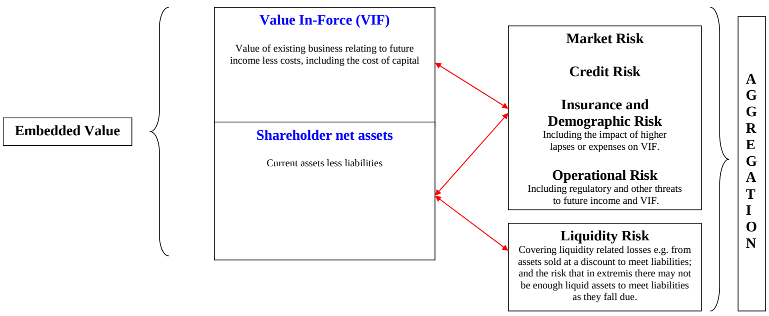
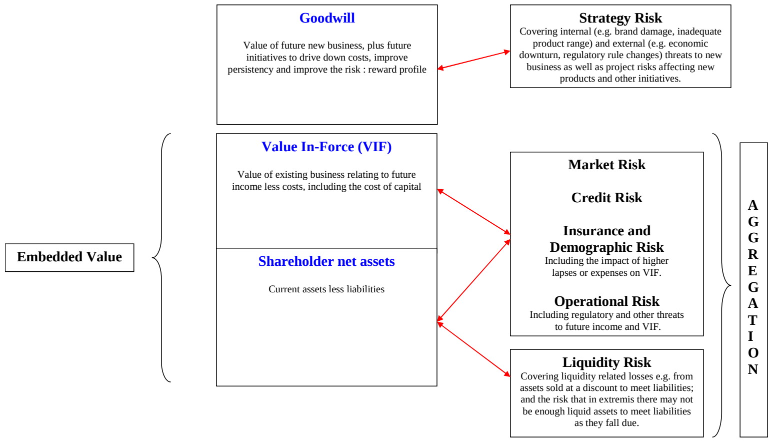
A view of the risks to a Financial Institution



A view of the risks to a Financial Institution



A view of the risks to a Financial Institution



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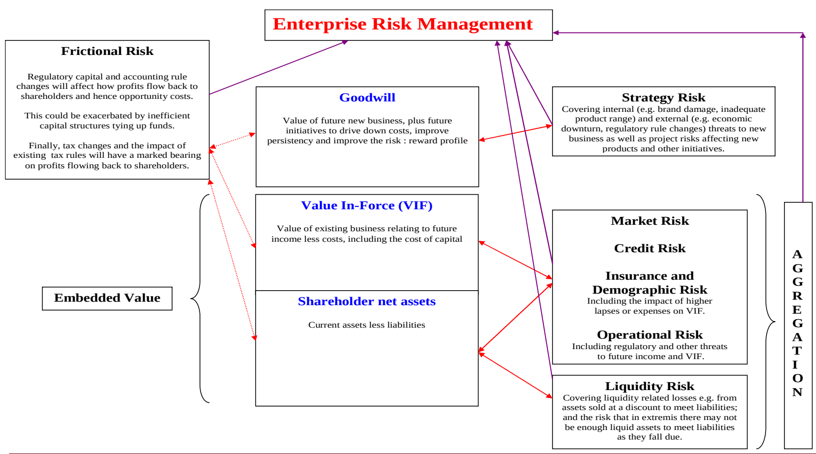
A view of the risks to a Financial Institution



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High Level Categories

- Based on the view above, we have arrived at the following high level categories:
  - Market
  - Credit
  - Insurance & Demographic
  - Operational

  Risks directly impacting Embedded Value incl.VIF

  - Liquidity – relating not so much as to the amount of assets v liabilities but whether they are liquid enough to meet liabilities as they fall due
  - Strategy – covering threats to goodwill
  - Frictional Risks such as tax, changes in regulatory capital requirements and accounting rules, and capital structure and the fungibility of capital
  - Finally there is an Aggregation & Diversification category to cover the interaction of the different risk types with each other

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Key concepts

- Event-based classification as opposed to cause-based – e.g. it would class what happened to Northern Rock as a Liquidity Risk rather than delving into the strategy that lead to the run on the bank.
- This is not to say causal based analysis isn't important – it certainly is! – but often such analysis can identify multiple causes.
- Focus is on gross risk and generally excludes control failures.
- In particular it treats ALM as a control and focuses more on the underlying exposures liabilities and assets each have.
- Reputation risk is classed under Strategy Risk – reputation damage may also lead to mass withdrawals but this is assumed to come under Persistency Risk and Liquidity Risk categories.
- Risks include regulatory capital and accounting impacts as well as the economic impact (noting that the impact of rule changes is covered under Frictional Risk).

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Market Risk – Concepts

- Market Risk covers equities, property, commodities etc., but note a distinction is made between actual and implied inflation.
- Market Risks may be further broke down into:
  - Specific risk relating to an individual share, bond or property
  - Sector impacts e.g. telecom shares, regional office property markets
  - General market impacts – domestic and overseas
  - Income risk relating to dividend and rent variability
  - Implied volatility of options for that particular asset class
  - Model Risk relating to changes in the value of derivatives for a particular asset class due to changing models of that asset class
  - Basis Risk relating to residual differences between movements in particular exposure and assets intended to hedge this out
- Note movements in say equity futures prices would come under Equity Risk and so on (even though the movement may also be driven by interest rate risk).

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Market Risk – Demarcation and other issues

- Should Private Equity be included under Equity Risk or as a stand alone category ? This standard assumes the former on the basis that exit values will ultimately be related to the wider equity market.
- Interest Rate Risk relates to movements in the risk-free rate – but what is this ? Gilts ? Swaps ?
- There is a need to distinguish between liquidity effects – the balance of buyers v sellers – in terms of their impact on markets and Liquidity Risk. The following demarcation has been adopted:
  - Changes in mid-market prices of assets come under Market Risk
  - Liquidity Risk covers lower bid-prices relative to mid-market price and falls in the deal size at which one can trade without affecting the price
- Note while rogue trading and similar trading losses are market related, these are still classed as Operational Risk.
- Similarly the impact of falling markets and economic downturns on new business comes under Strategy Risk.

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Credit Risk – Concepts

- 28 categories of Credit Risk have been identified, broadly by source of Credit Risk
- The following Credit Risk variables may be considered:
  - Probability of Default (PD)
  - Exposure at Default (EAD – e.g. for credit cards)
  - Loss Given Default (LGD – allowing for collateral & other recoveries)
  - Migration Risk i.e. downgrades (/ poorer internal credit rating)
- The risks may be broken down further by variable or in aggregate as follows:
  - Model Risk e.g. increase in bad debt provisions due to model change
  - Process Risk due to random fluctuations including concentration risk
  - Parameter Estimation Risk
  - Regional / Sub-portfolio impacts
  - Domestic Shocks
  - Overseas Shocks e.g. currency restrictions preventing repayment

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Credit Risk – Demarcation and other issues

- For bonds, how might one distinguish between defaults and downgrades (Credit Risk) and general spread movements (Market Risk) ? The market may already have factored these into the price.
- Market movements will affect collateral values and hence LGD but propose this impact is still considered under Credit Risk as it is contingent on default.
- Outsourcing is generally considered an Operational Risk but where should failure of the outsourcing counterparty come into ? For this standard, we propose only accruals should come under Credit Risk with losses in respect of services not yet paid for (and which will need to be sourced elsewhere) coming under Operational Risk.
- Failure of an asset manager (incl.OEICs) will generally be treated as outsourcing failure (Operational Risk) except for reinsured fund links which is classed as Credit Risk due to broader exposure.

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Insurance and Demographic Risk – Concepts

- 28 categories of Insurance and Demographic Risk have been identified, broadly based on Solvency II categories (though
- For General Insurance, the following variables may be considered:
  - Claim Frequency – Prospective
  - Claim Frequency – IBNR
  - Claim Severity – Prospective
  - Claims Severity – Claims reported but not settled
  - Claim Severity – IBNR

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Insurance and Demographic Risk – Concepts

- The risks may be broken down further as follows:
  - Model Risk – increases in reserves e.g.due to new severity model
  - Process Risk – due to random fluctuations including concentration risk
  - Parameter Risk – arising from statistical estimation
  - Heterogeneity – variations in underlying portfolio distorting experience
  - Trend Risk – rate of change different from expected
  - Endogenous Shocks – e.g. changes in underwriting standards
  - Exogenous Shocks – e.g. more refined rating by competitors
  - Catastrophe

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Insurance and Demographic Risk – Demarcation and other issues

- Non-disclosure – this may be viewed as a form of fraud (Operational Risk) but could also be due to say poor wording of underwriting questions. Have included non-disclosure under this category as unless detected, it will be implicit in claim experience.
- Option take-up rates and costs will vary with market conditions, but propose that variations in rates from expected should come under this category even if the variation is due to market conditions (expectations should probably be dynamic).
- Expense and Property re-build costs will be linked to inflation, but propose that inflation of these comes under this category as opposed to Market Risk as they will be affected by other factors such as the rate of change of the portfolio and specific construction industry factors.

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Liquidity Risk – Concepts & Issues

- Banks are particularly vulnerable to Liquidity Risk as their business model essentially involves "borrowing short and lending long".
- General Insurers also need liquidity to meet claims arising.
- Historically Liquidity Risk has been an issue for life insurers who take in money on a long-term basis and invest most of this in marketable securities. However this is changing as portfolios mature and increased hedging leads to higher margin calls.
- Aside from not being able to meet liabilities as they fall due, Liquidity Risk can give rise to losses in respect of:
  - Assets realised for less than balance sheet value in order to meet liabilities, possibly at "fire sale" prices; and
  - Interest on borrowing to tide over liquidity shortfalls.
- Would argue that only the excess interest over base rates on borrowings should count towards liquidity losses.

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Liquidity Risk – Concepts & Issues

- In terms of demarcation, while the definition of Credit Risk as failure of a counterparty to honour obligations may include failure of a lender to honour a line-of-credit, this standard treats this as a Liquidity Risk.
- Default of a deposit counterparty would be counted as Credit Risk but any additional cost in seeking to replace these liquid funds (e.g. through borrowing) should come under Liquidity Risk.

Operational Risk – Concepts

- 22 Operational Risk categories have been identified based on ABI ORIC / Basel II definitions.
- Propose that:
  - Operational losses include overtime and temporary staff recruited to solve a problem but not the cost of existing of staff who may be switched to problem solving i.e. marginal costs only.
  - IT errors relating to e.g. transaction processing should come under the category for transaction processing rather than under IT as these errors may be as much about specification and testing than coding.

Operational Risk – Demarcation and other issues

- The Basel II decision tree used by ABI ORIC to allocate events to categories can be flawed e.g. if there is a regulatory breach, it would allocate misselling events to Suitability, Disclosure and Fiduciary rather than Advisory Activities & Misselling

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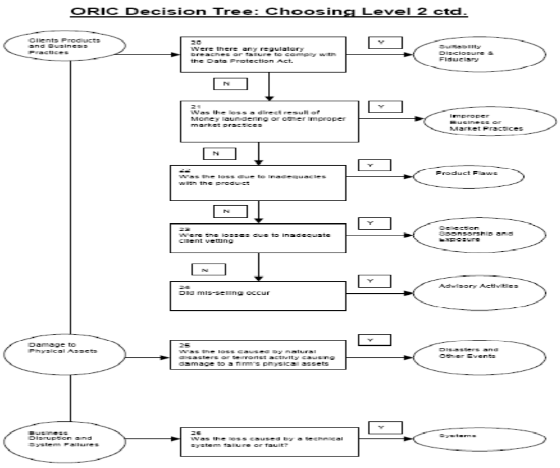
Operational Risk – Demarcation issues



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Operational Risk – Demarcation and other issues

- The Basel II decision tree used by ABI ORIC to allocate events to categories can be flawed e.g. if there is a regulatory breach, it would allocate misselling events to Suitability, Disclosure and Fiduciary rather than Advisory Activities & Misselling.
- The proposed standard seeks to avoid this problem by delving into operational risk in extensive detail (340+ sub-categories) rather than relying on a decision tree.
- External parties may collude with staff to defraud a firm – propose this is Internal Fraud.
- Operational loss events can give rise to reputation damage, but propose this is covered under Strategy Risk as the former does not necessarily have to give rise to the latter, and PR management can limit any reputational impact.

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Strategy Risk – Concepts

- Still work in progress, but currently looking at breaking this down into exogenous and endogenous factors.
- Exogenous factors would include:
  - Impact of markets and economic conditions on sales
  - Tax and Regulatory impacts such as CGT changes and RDR
  - Actions of competitors
- Endogenous factors would include:
  - Quality of products and services offered
  - Project failures e.g. failure to launch new product
- Endogenous factors includes Brand and Reputation Risk relating not only to reputation impacts (e.g. perception of poor financial strength; reputation damage of misselling and other operational events) but also whether our brand supports our strategy.

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Strategy Risk – Concepts

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Strategy Risk – Concepts

- Strategy Risks relate not just to new business but also to back book initiatives / projects to:
  - Drive down expenses – relative to embedded value assumptions (propose that Insurance Risk covers where assumptions rely on a project to deliver cost savings and this does not deliver)
  - Improve persistency – again relative to embedded value assumptions
  - Improve the risk : return profile through hedging initiatives – with the reduction in economic capital requirements / costs offsetting any premium that a hedge counterparty may require
- A firm may calculate its appraisal value including "goodwill" relating to future sales and project benefits, and quantify the Strategic Risk impacts of reduced sales / failed projects against this value
- Alternatively it may view "goodwill" as the excess of a firms market capitalisation over embedded value, and consider the impact of poor new business results etc. on this differential.

Strategy Risk – Demarcation and other issues

- While this standard looks at Strategy Risk as a separate risk, there is an alternative argument that strategy impacts should be looked at as part of other risk categories:
  - Impact of equity and other market movements in sales should be considered under Market Risk;
  - Reductions in projected new business profitability due to adverse claim, expense or persistency should come under Insurance Risk;
  - Reputation impacts from operational loss events should come under Operational Risk…
  - …while Market, Credit and other risks would include the damage to (perceived) financial strength and its impact on new business;
- Similarly there is an argument that Project Risk should be a high level category in its own right.

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Frictional Risk

- Often the economic impact of risks will differ from the accounting and regulatory capital impact.
- Frictional risk covers:
  - Changes in regulatory capital rules affecting the amount of capital required, and the cost of this capital, in the absence of any change in risk and economic capital requirements.
  - Changes in accounting policy affecting the perception of the business and dividends payable to shareholders.
  - It also covers inefficiencies in operating structure (e.g. capital tied up in subsidiary entities) and the problems caused by intra-group exposures.
  - Finally it also covers tax impacts – both changes in general taxation and also company specific impacts such as impairment of tax assets.
- Again, this is still work in progress.

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Aggregation and Diversification

- Ultimately risk classification is only a starting point in ERM – there is a need to understand how the individual strands represented by the categories above come together.
- This section attempts to identify how individual risks interact with each other across categories, and how events may lead to anticipated diversification benefits not being realised, or worse, that the aggregate may exceed the sum of the parts.
- An example of such an event might be a flu pandemic. While a low correlation may be assumed between Mortality and Market Risks, a pandemic may depress markets as well as leading to mortality losses on assurances. It may also depress economic activity leading to higher unemployment, lapses and creditor claims.

Conclusion and next steps

Conclusion

- To conclude, there is no perfect system of classifying risks – the standard proposed merely aims to act as a common reference to assist comparison.
- There can be other equally valid classification systems – so long as they properly demarcate between categories, address potential areas of overlaps and are as unambiguous as possible. However this is a non-proprietary classification freely available to all.
- While risk classification helps in viewing risks in a coherent fashion, and in allocating responsibilities, care should be taken not to look at risks in “silos”. There is considerable interaction between risks and a holistic approach should be taken to their management.

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Next steps

- In terms of next steps, the working party hope to finalise the standard over Q3, with a view to issuing for comment over Q4 2010.
- We look forward to receiving comments on the standard and hope you may find the standard of use in communicating on risk issues.

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Any Questions ?

Appendix – Proposed Standard Risk Categories

Market Risk – Categories

- Equity Risk including Private Equity
- Property Risk including Residential Property (/HPI)
- Nominal Interest Rate Risk covering movements in risk-free rates
- Real Interest Rate Risk covering changes in real risk-free rates and their impact on implied inflation
- Swap Spread Risk relating to the spread of swaps over Gilts
- Bond Spread Risk relating to the spread of Corporate and other bonds over risk-free rates
- Commodity Risk
- Foreign Exchange Risk
- Actual Inflation Risk (as distinct from implied inflation)
- Aggregation and diversification including the risk from changes in market implied correlations

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Credit Risk – Categories

- 28 categories of Credit Risk have been identified, broadly by source of Credit Risk
- Bonds
  - Corporate Bonds
  - Structured Bonds including RMBS, CMBS, ABS and CDOs
  - Quasi-Government Bonds including Municipal and Supra-National
  - Sovereign Bonds
- Retail Lending
  - Retail Mortgages
  - Other Secured Retail Lending
  - Credit Cards and Overdrafts
  - Other Unsecured Retail Lending

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Credit Risk – Categories

- Corporate Lending
  - Commercial Mortgages
  - Other Secured Commercial Lending (e.g. asset finance)
  - SME Unsecured Lending
  - Wholesale Unsecured Lending including syndicated loans
- Deposit Counterparties
- Money Market Counterparties including ABCP
- Tenant Default
- OTC Counterparty
- Derivative Exchanges and other Clearing Houses
- Securities Lending
- Dealing and Settlement (mostly mitigated through DVP)

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Credit Risk – Categories

- Custodians (should be mitigated by ring-fencing of assets)
- (Re)insurer Default – Insurable Risks
- Insurance and other Asset Management product exposure including guaranteed products and reinsured fund links
- Business related loans (e.g. to distributors)
- Accruals (amounts pre-paid for services)
- Trade debtors
- Indemnity Commission
- Miscellaneous Credit Risk
- Aggregation and diversification of Credit Risk including aggregations of exposure to a single counterparty across categories

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Insurance and Demographic Risk – Categories

- 28 categories of Insurance and Demographic Risk have been identified, broadly based on Solvency II categories.
- Longevity
- Mortality
- Morbidity
- Accident and Health
  - Health Insurance
  - Workers Compensation including Employer Liability
  - Personal Accident Cover (excluding Motor – see below)
  - Other (including veterinary bills under Pet Insurance)
- Motor
  - 3rd Party Liability
  - Other (including Personal Accident benefit)

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Insurance and Demographic Risk – Categories

- Marine, Aviation and Transport (MAT)
- Fire and other Property Damage
  - Commercial
  - Residential
- Personal Belongings (excl.property contents but including pets)
- Warranties
- Third Party Liability
  - Product Liability
  - Public Liability
  - D&O and Professional Indemnity
  - Other
- Legal Expenses Cover

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Insurance and Demographic Risk – Categories

- Creditor and Suretyship (including Unemployment Cover)
- Assistance (e.g.AA cover)
- Miscellaneous Non-Life Insurance Risk
- Persistency:
  - Withdrawal Rates
  - PUP Rates
- Option Take-Up
- Other Demographic (e.g. proportion married)
- Expense Risk
- Aggregation and diversification of Insurance and Demographic Risk

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Liquidity Risk – Categories

- Non-discretionary Liability Related Outflows e.g. maturities
- Discretionary Liability Related Outflows e.g. surrenders
- Asset related outflows e.g. margin calls on derivatives
- Corporate Outflows e.g. dividend payments
- Impairment of Liquid Resources e.g. reduced marketability of listed securities; suspension of money market fund realisations
- Frictional Strains – liquidity shortages in particular currency, subsidiary or fund
- Aggregation of Strains

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Operational Risk – Categories

- 22 Operational Risk categories have been identified based on ABI ORIC / Basel II definitions.
- Internal Fraud
  - Unauthorised Activity e.g. rogue trading
  - Theft and Fraud
- External Fraud
  - Theft and Fraud
  - Systems Security e.g. "phishing"
- Employment Practices and Workplace Safety
  - Employee Relations e.g. strikes; constructive dismissal claims
  - Health and Safety
  - Diversity and Discrimination

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Operational Risk – Categories

- Clients, Products & Business Practices
  - Suitability, Disclosure & Fiduciary e.g. breach of faith
  - Improper Business or Market Practices e.g. bribery; money-laundering
  - Product Flaws
  - Selection, Sponsorship & Exposure e.g. failure to vet client status
  - Advisory Activities & Misselling
- Damage to Physical Assets
- Business disruption and system failures e.g. computer crashes
- Execution, Delivery & Process Management
  - Customer Intake and Documentation – errors in setting up contracts
  - Transaction Capture, Execution & Maintenance – errors in servicing of contracts as well as general transactions such as supplier payment
  - Customer / Client Account Management – errors in claims etc.

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Operational Risk – Categories

- Execution, Delivery & Process Management
  - Monitoring and Reporting e.g. account misstatements
  - Trade Counterparties e.g. asset managers; reinsurers
  - Vendors & Suppliers e.g. outsourcers
- Operational Risk Capital – not covered in ABI ORIC but emerging loss experience can have a "knock on" impact on OR capital requirements, as may scenario analysis and model changes.
- Aggregation and Diversification e.g. weak corporate governance leading to multiple losses across categories.

Strategy Risk – Exogenous Risk Categories

- Market Risk related:
  - Equity market falls reducing investment sales and pension transfer values, but increasing demand for other types of funds
  - Base rate changes affect how attractive deposits are to other savings products
  - Medium term bond yield changes affecting structured product terms and fixed rate mortgage deals
  - Equity volatility changes also affect structured product terms
  - Residential property prices and rents affecting the attractiveness of buy-to-let but with the former also affecting average mortgage protection case sizes
- Other Macroeconomic Risks including:
  - Change in mortgage lending volumes affecting the volume of mortgage protection business
  - Unemployment affects general demand and scheme membership for corporate pensions
  - Pay rises levels which affect corporate pension increment business

Strategy Risk – Exogenous Risk Categories

- Credit Risk related – changes in credit experience affecting future new business profitability (though re-pricing can mitigate this)
- Insurance Risk related – changes in persistency levels and other experience affecting future new business profitability (ditto)
- Fiscal :
  - Changes in the tax on different products affecting demand for each
  - Overall tax burden affecting demand for products
- Political Risk – political uncertainty affecting demand
- Regulatory Risks to sales and goodwill including:
  - Impact on distribution of products e.g. RDR
  - Regulation of products themselves e.g. Stakeholder price cap
  - Knock-on impact of regulatory capital changes (e.g. S2) on sales

Strategy Risk – Exogenous Risk Categories

- Risk from general demographic and social changes e.g. increasing internet usage; ageing population who are “asset rich, cash poor”
- Product market trends e.g. growth of Wrap differs from expected
- Competitor Risks including:
  - the impact on sales of competitor pricing…
  - …and competitors tying up of distribution channels
  - also covers “poaching” of staff
- Distribution Risks e.g. reductions in adviser numbers at key distributors, or worse distributor insolvency
- Product Provider Risks – where a firm relies on another providers products, the risk these are withdrawn or terms made less attractive.
  - Includes insurers’ reliance on reinsurers.

Strategy Risk – Endogenous Risk Categories

- Product Risk – that these aren't good enough to meet target market
- Service Risk – covering not only inadequate service to meet target market expectations but also inappropriate service models (e.g. offering a "Rolls Royce" service not justified by margins available)
- Brand and Reputation – risk from:
  - Reputational damage from operational failings such as misselling; or self-inflicted damage (e.g. Ratners)
  - Concerns over financial strength (from market and other events)
  - Brand that does not support strategy (e.g. perceived as a Volvo when we wish to target the Ferrari market)
- Project Risks – failure of projects to:
  - Enhance (/make good gaps) in product and service proposition
  - Cut expenses and improve persistency
  - De-risk portfolios and improve risk : return profile

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Strategy Risk – Endogenous Risk Categories

- Pricing capability – not having:
  - Sufficient expertise in pricing products;
  - Data to effectively price products in the market
- IT systems – cant support where we want to go in the first place
- Strategic partners – e.g. failure of joint ventures; outsourcing partners cannot handle proposed new products
- Poor planning including defective assumptions
- Initial expenses risk of higher commission rates than expected; lower case size and margins; and higher quote costs
- Cost base – risk our cost base makes us uncompetitive
- Leadership – poor strategic direction leading to sub-optimal strategy
- Aggregation – combined impact of all the above

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Aggregation and Diversification

- Initial thoughts on possible links between risks:
  - Credit cycles – “busts” like that seen recently may depress markets and lead to recession with higher credit losses, lapses and creditor claims.
  - Linked to credit cycles would be the impact of volatile currency flows such as those seen in the 1997 Asian crisis.
  - Even in the absence of a credit “boom”, falls in property prices could reduce collateral values and lead to a wider credit crunch
  - Lehman’s style counterparty default may depress markets and possibly economies as well as leading to counterparty credit losses.
  - Hedge funds may have to liquidate assets in one market to meet margin calls in another – as well as spreading the impact across markets, losses on positions may lead to banks reign in lending and thus spark a wider credit crunch

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Aggregation and Diversification

- Initial thoughts on possible links between risks, continued:
  - Life insurers and/or pension funds may be forced into selling equities and other assets to meet solvency requirements, depressing markets, leading to bank losses on positions and possibly a wider credit crunch
  - Flu pandemic – as well as mortality losses on assurances, this may depress markets and possibly economic activity, with the latter leading to higher unemployment, lapses and creditor claims
  - Other shocks e.g. 9/11 could lead to wider market and economic losses as well as initial insured losses

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