Stress testing in the real world

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March 2011
Backdrop

Failure to predict sub-prime fallout....
“We were seeing things that were 25-standard-deviation moves, several days in a row”

D. Viniar, Goldman Sachs CFO

“The source of most extreme outcomes is not the fulfilment of possible but improbable predictions within models, but events that are outside the scope of these models”.

John Kay

“All models are wrong, but some are useful”

George Box, Statistician
What are risk managers faced with?

Risk

- Defined set of outcomes with known probabilities
- VaR models predicated on “risk” view of the world

Uncertainty

- Multiple possible uncertain outcomes
- Subjective probabilities
- Real world risk management is dealing with uncertainty
Common problem – forecasting the future…..

…but still need to manage the institution for the benefit of shareholders
Stress testing – one answer to dealing with uncertainty

Expectations

• Unreasonable to expect an exact answer
• Not concerned with pinpointing probability or loss outcome
• Structured approach more important
• Real need to have a basis for decision making

Usefulness

• Precipitate common sense insights and debate
• Direction correct
• Source of outcome correct
• Model must simply be useful
• Framework for distilling reality to aid decision making
Increasing severity of stress tests

Current Market (forecast error)
- Calibrated to the most likely dislocation from current levels
- Losses could also result from forecast errors and a range of small losses adding up

Adverse market (earnings volatility)
- Calibrated to a notion of market distress that is seen to be adverse.
- This can include the 1987 market crash, or the Global Financial Crisis impact on different countries, or other variations

Event risk stress (solvency)
- Calibrated to worse market stress than has been seen in history or
- Hypothetical events which seems remote, but possible or
- Statistical / non statistical low probability events
Stress tests we’ve found useful

…..(knowing that all are wrong)
Credit risk – stress testing wholesale lending

Corporate balance sheet
- Credit approval process
- Assignment of rating (this is used in portfolio level stress testing)

Project finance
- Cash flow modelling
- Stress discount rate or cash flows

Non-recourse lending
- Collateral cover ratio
- Volatility of security
Credit risk – stress testing counterparty exposures

Look-through insight

- Stress counterparts portfolio as though it was our own
- If counterpart is in trouble, we’re in trouble
- Contingent market risk
- Prime-brokering platform
Investment risk – stress testing investee companies

Unlisted investments
- Shock to earnings
- Leverage key
- Deal structure important

Listed investments
- Treat as market risk
Distribution-based stresses
- Liquidity horizon rather than market shock
- Multiple horizons
- Separate out idiosyncratic elements

ETL modelling
- ETL more conservative than value-at-risk
- “Through-the-cycle” calibration – include stress
- Focus on impact of extending holding period
### Risk appetite framework

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- Portfolio stress to “floor” specific stresses

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Pulling it all together – stress testing aligned to strategy
Pulling it all together – stress testing aligned to strategy…this requires a risk appetite framework

Growth and volatility targets

Growth target

MAX 1 year earnings fall

?%

Revenue type

Activity

Expected ROE

Agreed mix

IBD
x%
y%

FICC
x%
y%

Equities
x%
y%

Investing
x%
y%

PE
x%
y%

Client
x%
y%

IBD
x%
y%

FICC
x%
y%

Equities
x%
y%

Trading (prop)

Resources
x%
y%

Mix

60% client

25% investing

15% trading

Growth and volatility targets

Growth target

MAX 1 year earnings fall

?%
Aligning stress testing to strategy

Framework against which to assess results

Sub-limits applied per income stream

Monitor trends and changes over time
Conclusion

We will succeed in managing financial risk better only when we come to recognise the limitations of formal modelling.

Control of risk is almost entirely a matter of management competence, well-crafted incentives, robust structures and systems, and simplicity and transparency of design.

John Kay
Questions