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A03: Using derivatives to meet shareholder and policyholder objectives

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2006 Life Convention

Overview

- Motivation for hedging and setting objectives
- Identifying candidate strategies
- Evaluating the impact
- Refining the strategy
- Implementation

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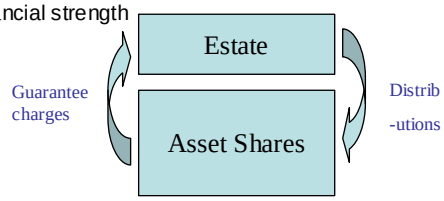
Background

- With-Profits Sub Fund of Scottish Equitable plc
  - 100:0, closed, estate to be distributed
  - Mechanisms for recharging guarantee costs
  - EBR depends on financial strength



- Key risks (ICA)
  - Market and credit risk accounted for over 90% of the ICA pre-diversification
  - Interest rate risk relatively small (GAO hedging already in place), equity and credit risk dominant

Motivation for hedging

- Good time to do it
- Wider capital optimisation project: SE & Guardian
- Equity and credit risks in the WPSF were material and correlated with other risks in Aegon UK
- Impact on policyholders
  - Guarantee recharges and cross-subsidies, investment freedom, distributions of the estate,
- Impact on shareholders
  - Potential burn-through cost / EV impact (small)
  - S&P rating

Getting started

- Selection of project team
  - Aegon UK, UBS, Watson Wyatt
- Define process
  - Clarify objectives
  - Identify & evaluate benchmark hedge
  - Refine hedge
  - Seek Board and other approvals in principle
  - Execute
- Aim to identify “quick wins”

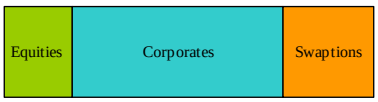
Initial objectives

- Primary objectives
  - Reduce and stabilise Pillar 2 capital requirements
  - Stabilise distributions of the estate to policyholders
- Limit any adverse impact on secondary measures
  - Pillar 1, IFRS, EEV, US GAAP
- No changes to asset shares or “management actions” in the short term but could be subject to later review
  - Hence preference for more liquid investments, and
  - Asset allocation changes limited to the estate

Motivation & objectives

WPSF asset mix - before

Estate



Asset shares

High correlation between estate and asset shares!

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Strategy identification

Parameters

- Preference for more liquid instruments
  - Potential changes in management actions
  - Potential changes in asset allocation for asset shares
  - Uncertain policyholder behaviour
- Performance of hedge excluded from guarantee charge calculation
  - More capital efficient, policyholders benefit
  - Simplifies evaluation
- Preference to avoid short positions
  - Avoid need for active management to contain potential losses

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Strategy identification

Setting the benchmark

- Data available to UBS
  - Free capital formula, fitted change in working capital and capital requirements for instantaneous changes in equity markets, credit spreads and interest rates
  - Information on nature and term of liabilities
- Considerations
  - Reasonably close match to changes in working capital and capital requirements, and duration of guarantees
  - Liquidity
  - Pricing

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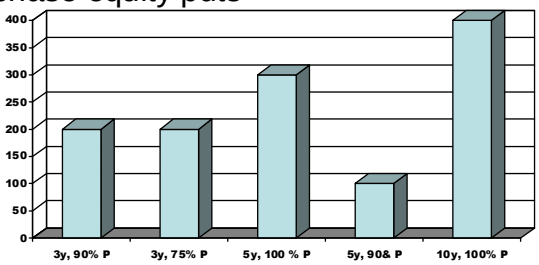
Strategy identification

Initial benchmark portfolio

- Sell equities and corporate bonds in the estate
- Purchase equity puts



- Purchase 10 year credit “5-15% put spread”

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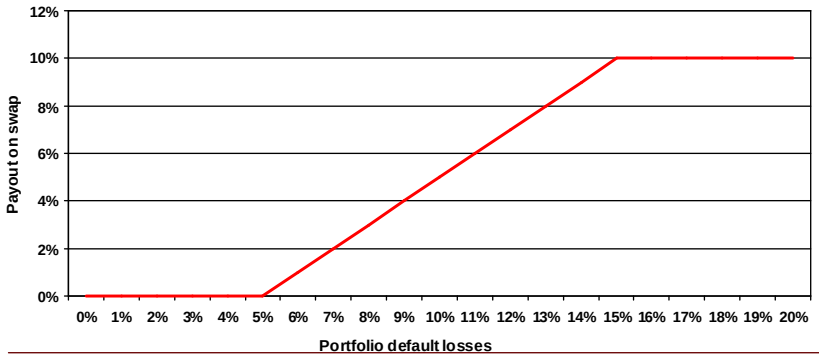
Strategy identification

Mezzanine credit protection

- CDS on reference portfolio – mezzanine tranche



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Impact evaluation

Evaluating the impact

- Sensitivity of working capital to one year market movements
  - Indication of robustness of ICA impact
- Immediate impact on ICA
- Impact on key measures over time
- Also checked impact on subsidiary measures (eg pillar 1 peak 1)

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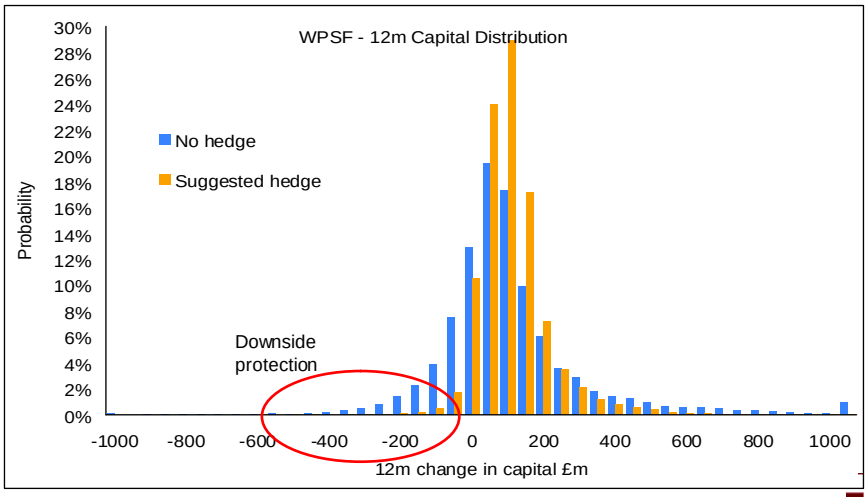
Impact evaluation

Impact on working capital



Source : UBS

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Impact evaluation

Impact on capital requirements

- Development of additional stress tests and correlation assumptions, eg
  - Tracking error
  - Dividend risk
  - Changes in implied volatility surface
  - Counterparty risk

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Impact evaluation

Impact on capital requirements

- ~60% reduction in the ICA for market risk
- Overall impact scaled down by ~25% due to diversification
- ~60% reduction in the RCM under P1 P2
- Adverse but acceptable impact on P1 P1

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Impact evaluation

Impact over time

Working Capital – 5 years

	Scenario	Working capital
Switch, no hedge	Benign	383
Post hedge	Benign	228
Switch, no hedge	Adverse	299
Post hedge	Adverse	253
Switch, no hedge	Benign then RCM	318
Post hedge	Benign then RCM	236

- Hedge underperforms in central scenarios
- Overhedging against adverse scenarios?

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Impact evaluation

The need for an additional measure

- Capital measures treat guarantee charges as an asset
- From a policyholder perspective looking to stabilise distributions of estate net of charges
- Total net distributions of the estate to policyholders projected over time

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Impact evaluation

Impact over time – net distributions

Net Distributions – 5 years

	Scenario	Working capital	PV future charges	Past distribns.	Total
Switch, no hedge	Benign	383	41	265	607
Post hedge	Benign	228	41	265	452
Switch, no hedge	Adverse	299	103	157	353
Post hedge	Adverse	253	103	157	307
Switch, no hedge	Benign then RCM	318	86	265	497
Post hedge	Benign then RCM	236	86	265	415

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Impact evaluation

Initial conclusions

- Benchmark is effective at reducing capital requirements, stabilising working capital and removing tail events in the short term
- Some concerns regarding decay of value and that may be underhedging over time
- Only considered broad characteristics of hedge so far

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Hedge refinement

Aims

- Refine equity hedge and decide on / refine credit hedge
- Improve the results of the evaluation to-date
- Finalise precise choice of hedge not considered by modelling to-date, eg
  - Index or benchmark options?
  - Price or total return options?

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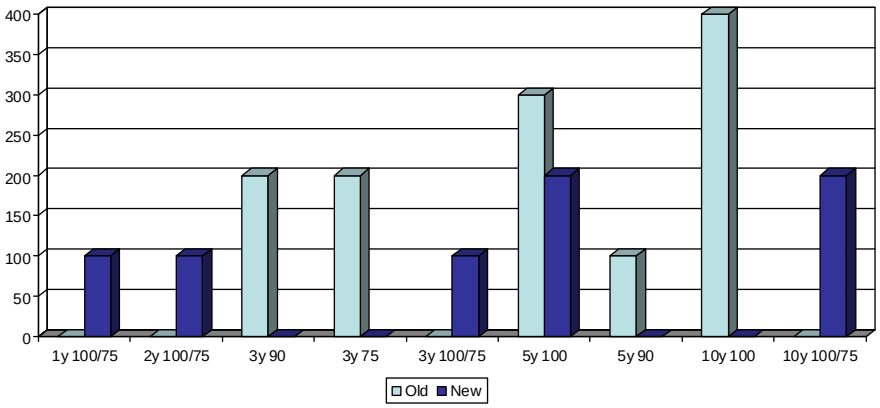
Hedge refinement

Refinements to the equity hedge



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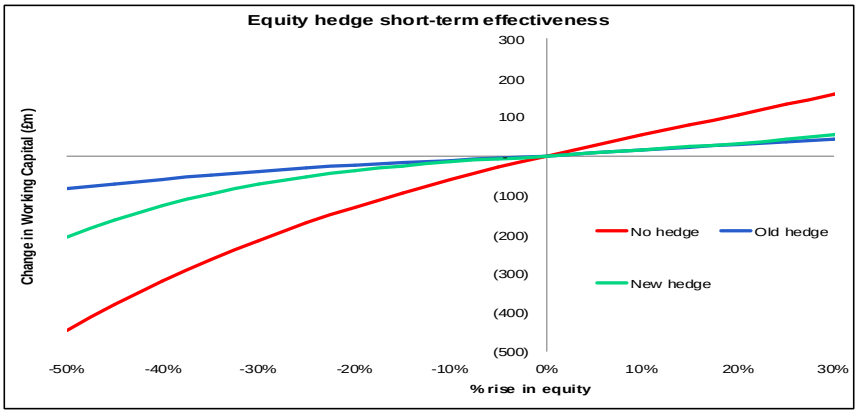
Hedge refinement

Updated impact on working capital



- New hedge ~15% less effective at reducing day 1 pillar 2 capital requirement than old hedge

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Hedge refinement

Updated results over 5 years

Net Distributions – 5 years

Equity	Credit	No hedge	Switch, no hedge	Old hedge	New hedge
Benign	Benign	662	607	452	452
Adverse	Benign	516	523	404	471
Benign	Adverse	471	470	388	387
Adverse	Adverse	291	353	307	373
Benign, RCM	Benign, RCM	420	497	415	447
Average	Average	472	490	393	426
Standard deviation	Standard deviation	136	92	54	43

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Hedge refinement

Other refinements to the equity hedge

- Total return versus price options
- Benchmark versus index
- Compound or not?
- Granularity

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Hedge refinement

Deciding on the credit hedge

- Some concerns
  - Duration of bonds longer than duration of reference portfolio and basis risk => need to rebalance and top up over time
  - Cover
  - Remoteness of protection
- Execution of equity hedge and sale of equities & bonds in the estate reduces pressure to hedge remaining exposure
- Decision not to hedge but to shorten credit duration

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Implementation

Implementation

- Internal sign-off
- Execution
- On-going management and monitoring

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Implementation

Internal sign-off

- Approvals in principle from Board and SEPT
  - Report from AFH and WPA
  - Independent report from Watson Wyatt
- Others (eg AUK audit committee, Group in Holland, FSA, auditors)

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Implementation

Execution

- Led by Aegon Asset Management
- Execution approach
  - Hedge market testing – pricing & timing
  - Sales of equities and bonds in estate
  - Credit duration shortening
- Outcome
  - Transacted entire equity hedge on one day, spread <5%
  - Sold c.£1bn estate equities/corporates, replaced with gilts
  - Credit shortening c.£3bn turnover, >15y AAA, <15y sub AAA

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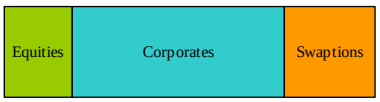
Implementation

WPSF asset mix - before

Estate



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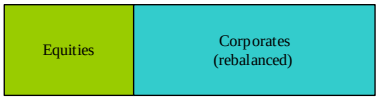
Implementation

WPSF asset mix - after

Estate

Asset shares



Offsetting/reduced correlation between estate and asset shares

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Implementation

On-going management

- Monitor on-going effectiveness of equity hedge
  - May change due to changes in balance of equity, credit and interest rate risks, the operation of and any changes in management actions, differences between actual and expected persistency
  - Identify ICA benefit each year
  - Repeat projection of policyholder distributions work annually
- Monitor and manage basis risk
- Monitor credit and interest rate risk

Conclusions

- Example of ICA embedding
- Very important to be clear on objectives of the exercise and to develop associated measures
- Evaluation is complex and requires development of models and assumptions
- Hedge refinement is worthwhile and can be quick once the measures have been agreed and the evaluation process has been set up
- Insurer/bank/adviser project structure
- Good outcome for policyholders and shareholders