building value together

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Asset Liability Management
-Applying ALM to takaful

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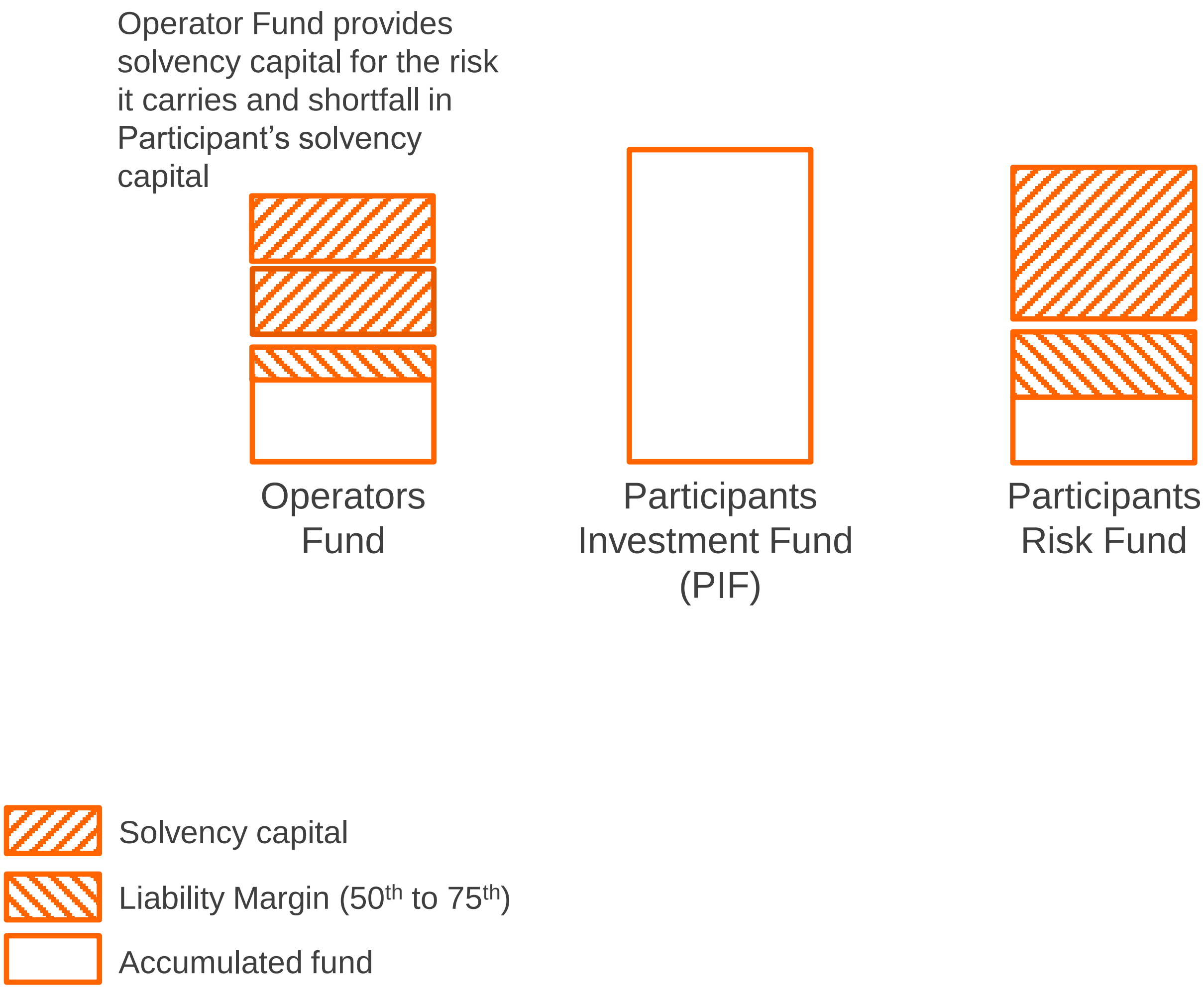
Takaful
- the story of multiple funds

- Family takaful has at least three funds
  - Operator Fund
  - Participants Investment Fund
  - Participants Risk Fund
- General takaful has at least two funds
  - Operator Fund
  - Participant Risk Fund

Asset Liability Management

- ALM traditionally use as a risk management tool to manage, among others;
  - Interest rate risks (movement in the yield curve affecting the value of assets and the “value” of liabilities)
  - Liquidity risk : claims(t) > [premium (t) + investment income (t) + maturing bonds (t)]
  - Currency risk
- RBCT now officially places a “value” on takaful liabilities which is linked to a “yield” curve. If there are cashflow mismatches between income and outgo, changes in yield curve would affect assets and liabilities differently resulting in changes in CAR.
- Actuaries in takaful, should they “impute” an expected return on investment to ensure a certain benefit is paid (guarantee?), would implicitly establish a link between Asset and Liability which raises a risk that needs to be managed.

Impact of RBCT on Takaful



Duration of the various funds

- Operator Fund
  - Free Capital is ‘on call’ to meet solvency margin/qard needs of Risk Fund
  - Short duration? Funds on Standby?
- Participants Investment Fund
  - Mudarabah contract
    - Long duration
    - Is capital preservation a priority?
      - Yes. ALM to ensure risk of negative return is **minimized**.
      - No. More aggressive investment but manage level of risk. Risk/return consideration.

Duration of the various funds
-contd.

- Participants Risk Fund
  - ‘Drip’ Pool
    - Short duration. No need for ALM.
  - Long term Pool
    - ALM to ensure ‘expected’ return is achieved at acceptable level of risk.
    - ALM to ensure duration of assets matches duration of expected claims. Generally to minimise required solvency margin and effect of movement in “yield curve” on CAR.

Should Takaful products promote guarantees?

- Are there sharia compliant assets available to support these either implicit or explicit guarantees?
  - If yes, then ALM to manage the risk. In theory if RBCT works, and Operator invests in these assets, then ALM should result in lower solvency margin needs.
  - If no, then ALM may not provide much benefit. Solvency margin requirements will be large.

What would be the least capital intensive takaful products?

- For Family takaful
  - Unit linked type PIF with no guarantee in ‘drip’ rates or in wakala fees. ALM can be used to manage volatility of returns in the PIF. Participant can choose between high volatility high return fund versus low volatility lower return fund.
- For General takaful
  - Low volatility short tail, risks e.g. fire and PA will have funds invested in cash, no ALM needs.
  - High volatility short tail risks, money invested in cash to meet claims, no ALM needs.
  - Long tail risks
    ALM to mitigate effect of inflation on claims settlement.

Conclusion

- In theory takaful is about risk sharing. Under risk sharing there are no guarantees, benefits may be reduced if fund is insufficient to pay claims.
  - Under risk sharing ALM is used only to manage risk of movement in asset value affecting benefit payment expectations. PIF where there are no guarantees of capital or dividend is a good example of when ALM can be used for this.

- Practice in takaful currently is different from theory, there is an implicit guarantee in certain takaful benefits (e.g. Mortgage Reducing Term Cover). ALM would here be used to manage both the expected yield and the RBCT CAR.

- Need to recognize limitations in Sharia assets available and the size of the pool under investment (many takaful pools are small). Like insurance ALM is dependent on past statistical experience and the “law of large numbers” (i.e. sufficiently large pool of takaful funds to allow diversification in assets). Are we comfortable with the Models?

Mo.net ALM
-Building the ultimate ALM model

Mo.net and ALM

- Hierarchical models allow fullly dynamic ALM
  - Assets and liabilities run at the same time under scenarios
- Rules model interacts with assets and liability projections
  - Full dynamic interaction at every time point
  - Allow application of dynamic constraints, rules and actions
- Projections can be run ‘seriatim’ to produce aggregate values

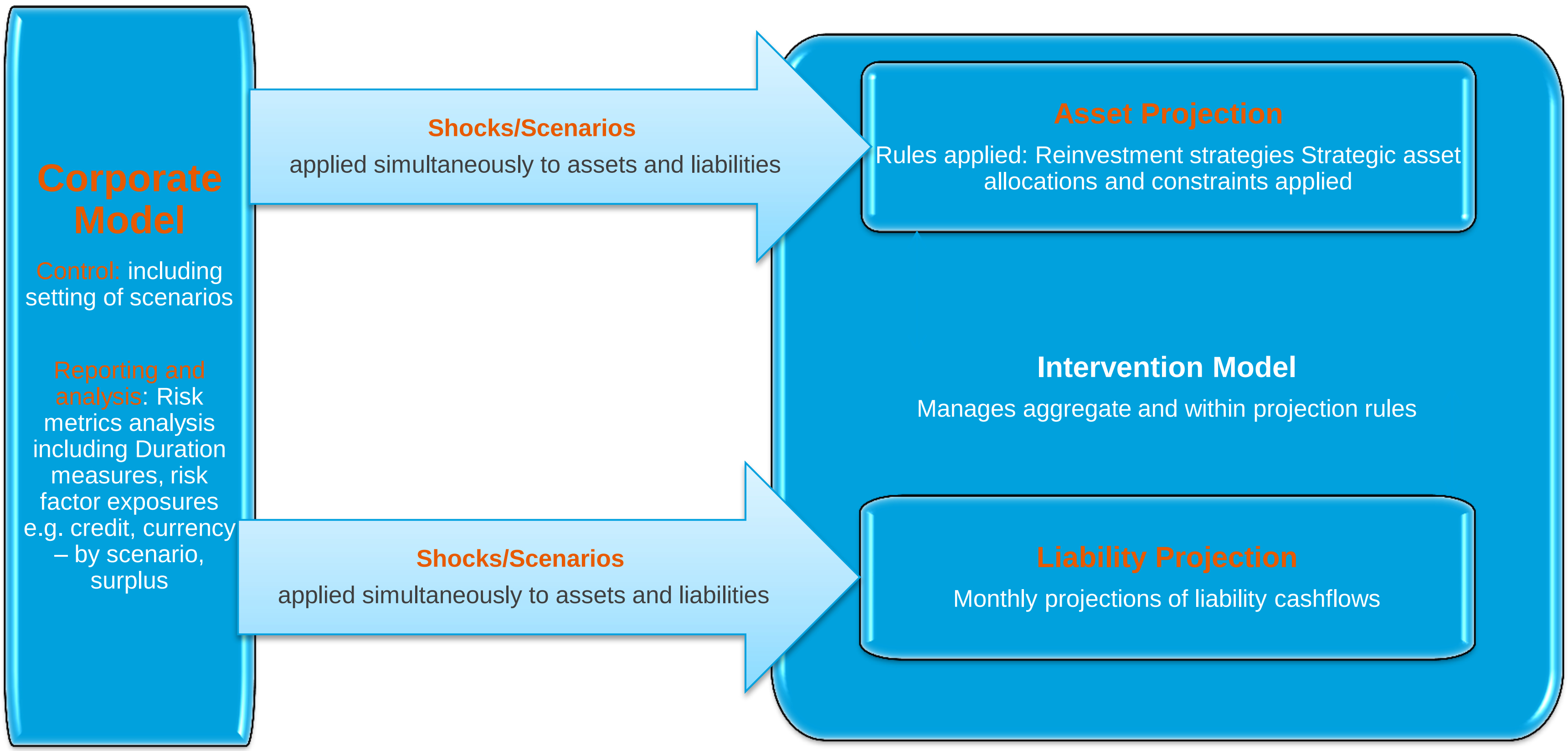
Modular approach

- **Assets**
  - Project each asset class and aggregate
  - Derive asset metrics, such as durations, risk factor exposures e.g. credit, currency – by scenario.
  - Monthly projections
- **Liabilities**
  - Project liabilities on a per record/policy basis
  - Monthly projections
- **Corporate** level model ‘sits above’ Assets and Liabilities (defines rules for management actions, risk appetite, risk strategy)
  - Also derives the Balance Sheet / Revenue Account.
  - Controls application of scenarios to assets and liabilities simultaneously
  - Reports on risk measures such as duration, liability matching

Intervention (Rules) Model

- Compares assets and liabilities at each time step in aggregate
- Apply management actions and rules dynamically
- **Micro** and **Macro-level** rules
  - Micro-Rules examples (within the asset and liability projections)
    - Assets
      - vary asset proportions according to how the projection is unfolding
      - rebalance
      - allocate maturity proceeds as bonds mature – reinvestment strategies
    - Liability
      - vary bonus rates, new business, expenses depending on performance
  - **Macro-rules** examples (at aggregate asset and liability)
    - Duration mismatch – intervene in both assets and liability
    - Immunization of assets and liabilities

Typical model Design



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