RISK explorer
Dynamic ▪ Financial ▪ Analysis

Economic Capital Modelling & Stress Testing

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URS Ultimate Risk Solutions

What is ERM & DFA?

- Enterprise Risk Management is the complete process of Review, Assessing and Managing the Risks that can affect any Company causing material change to their financial status.
- Material Change can be caused by
  - Greater Claims Frequency than expected
  - Greater Claims Severity
  - Higher expenses
  - Lower premium volumes & Rates
  - Poor performance than expected
  - Change in reinsurance costs
  - Reinsurance Bad Debt
  - Unfavourable Foreign Exchange Rates
  - Unfavourable run-off of prior years business
- The difficulty is quantifying these items at the same time in a structured process.
- Solution is to perform a Dynamic Financial Analysis of your business to capture all the above.

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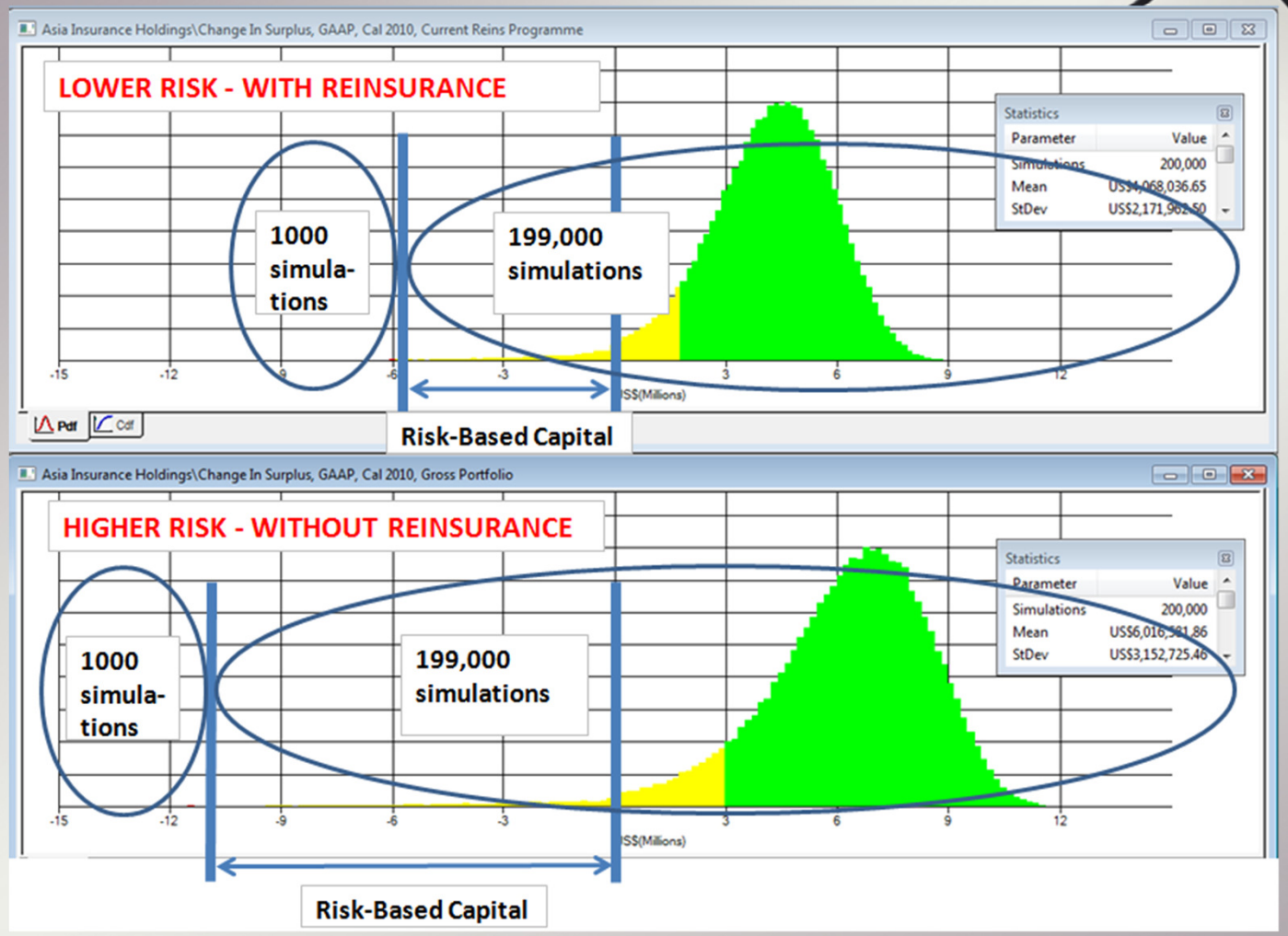
RISK explorer
Dynamic • Financial • Analysis

What is ERM & DFA?

- Dynamic Financial Analysis (DFA) involves the evaluation of risks of an insurance company through the use of computer simulations
- Concept invented in late 1980's / early 1990's by specialist reinsurers, also reinsurance brokers to better analyse reinsurance programmes (primarily property catastrophe) for clients
- DFA assists in areas of
  - Pricing inward business including Contract design & terms;
  - Structuring efficient Purchasing of Outward Reinsurance Covers;
  - Calculation of Economic Capital Requirements ("ECM");
  - Cashflow and Treasury Management;
  - Run off of Prior years
  - Assessing of Aggregate Exposures incl. Natural Cats

Economic Capital Modelling



DFA and Risk Management

- DFA is used today within both mutual and corporate insurance companies and reinsurance companies globally to enable them to better understand their risks and hence be in a better position with which to mitigate that risk.

- It also forms an integral part of Enterprise Risk Management and subsequently plays a major role for companies seeking internal model approval under Risk Based Capital (RBC) regimes such as the Individual Capital Assessment (UK) and Solvency II (Europe).

- DFA (incl Economic Capital Modelling) Versus RBC ?

- Due to its requirement by rating agencies such as AM Best, S&P and Fitch it is also a critical function for those companies seeking such approval and in demonstrating their solvency and credibility within the insurance industry.

Types of Risk
(and how to measure them)…

"There are Known Knowns. There are Things We Know We Know..."

Historical Experience

"There are Known Unknowns. There are some Things We Don't Know..."

Industry / Peer Experience

"There are also Unknown Unknowns. The Things We Don't Know We Don't Know..."

Mathematical Techniques for Estimation and Simulation

What is DFA compared to RBC?

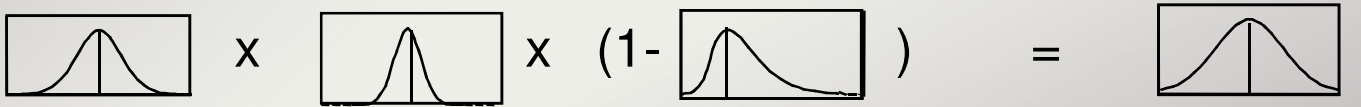
- Deterministic Method

  We use static simulations to test individual events or scenarios:

  No. Policies x Premium x (1 – Combined Ratio) = Operating Profit

  100,000 x $ 500 x (1 – 95%) = $ 2,500,000

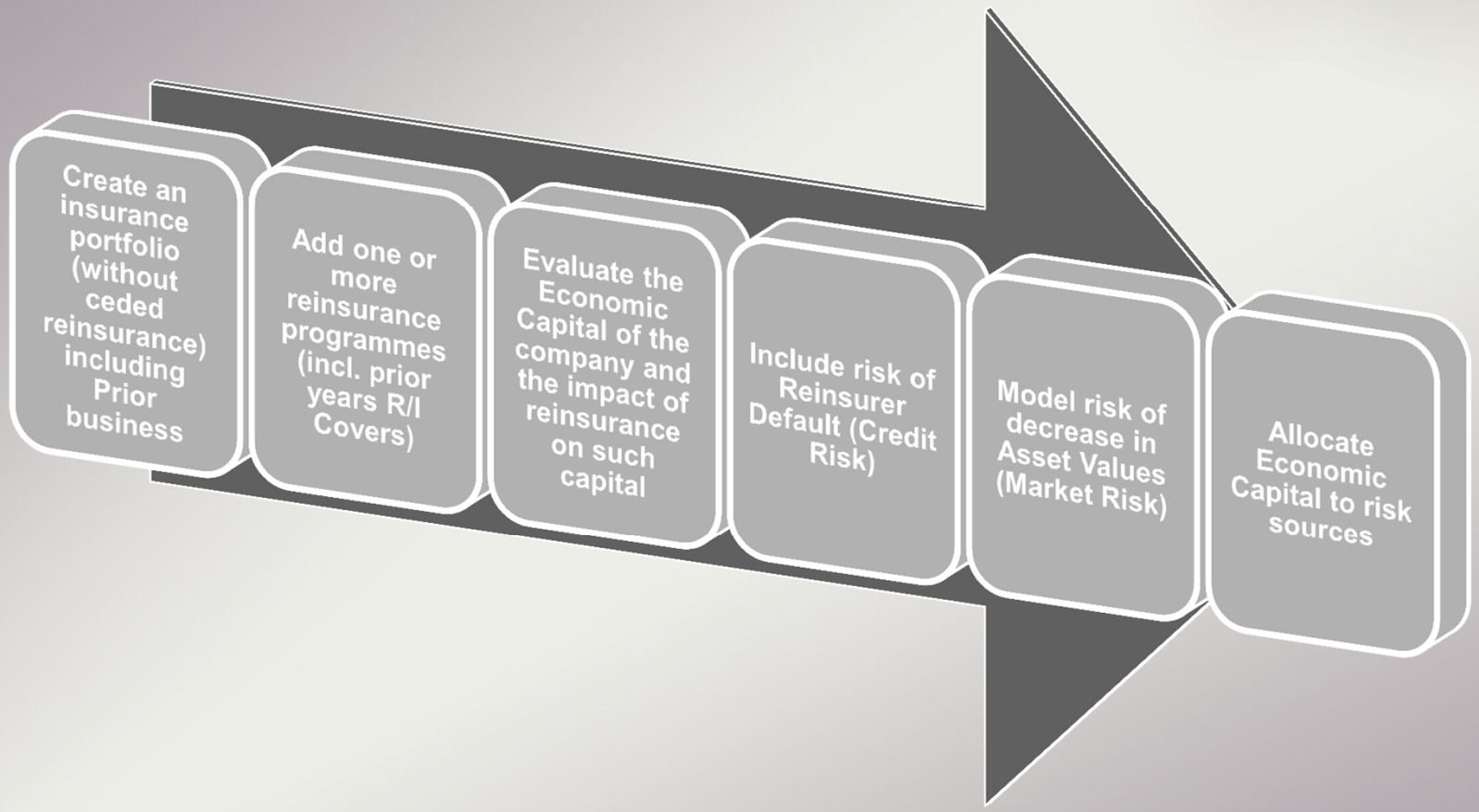
- Stochastic Method (DFA)



100,000 **$ 500** **95%** **$ 2,500,000**

- DFA employs multiple simulations Versus Simple Factor Approach for RBC.

Building a DFA model



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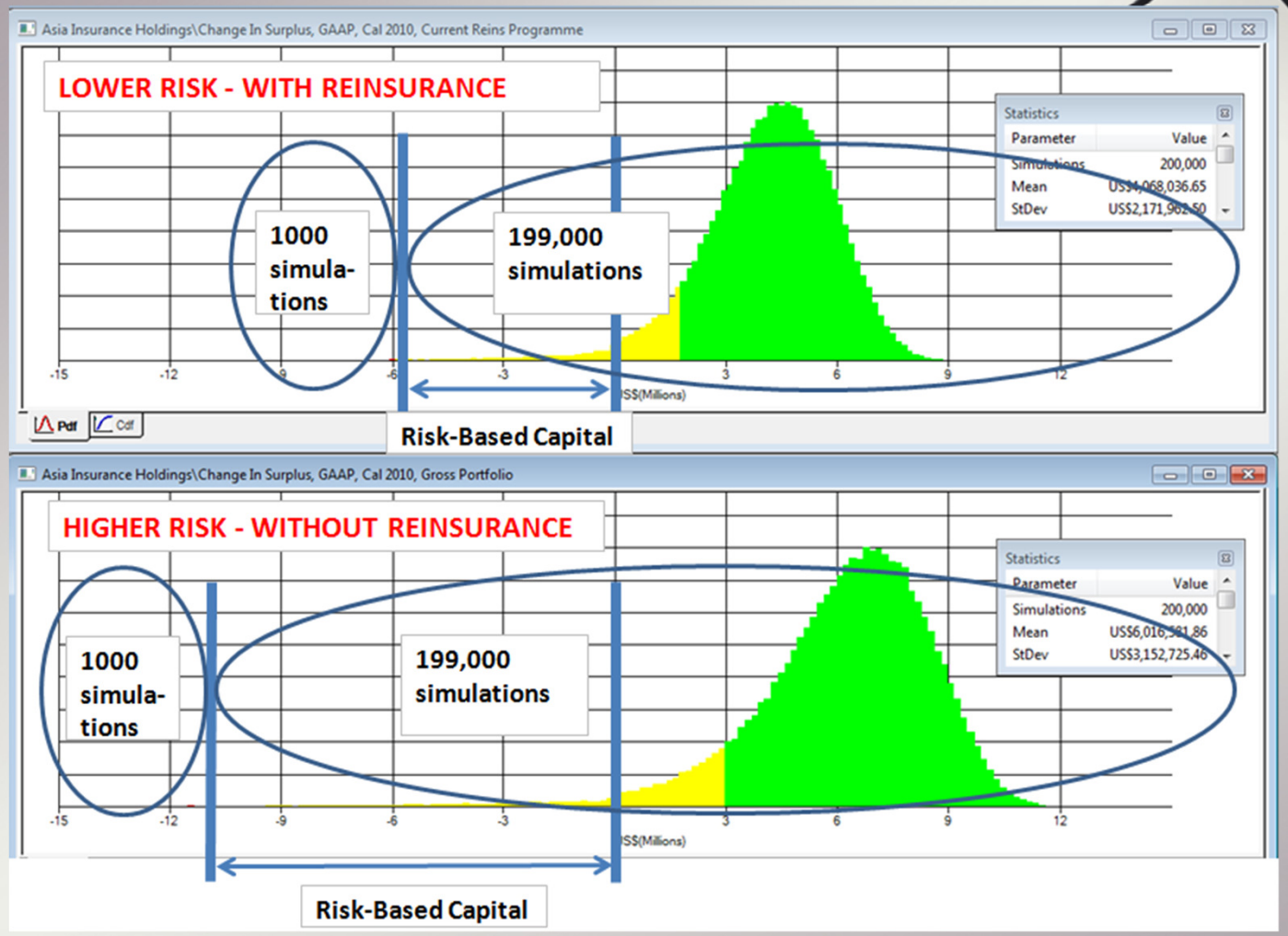
Data and Process required

- Opening Balance Sheet [* denotes potentially volatile]
  - Assets [Cash, Bonds*, Equity*, Deferred Tax etc] all by Currency
  - Outstanding Loss Reserves* Including IBNR* by class of business and the expected payout profiles for these (Gross & Net of prior reinsurance)
- New Business
  - New business assumptions by class of business [including any output from Commercially available Cat modelling Companies (RMS/EQE/AIR) if appropriate to your business]
  - Expected Reinsurance structure to cover new business [i.e Quota Share and or Excess of loss, including any structured reinsurance or multi year transactions]
  - Expenses incurred at an overall level (ULAE) and the cost of claims handling and also investment charges.

Output Delivered

- Future Balance Sheet(s)
  - Can be for overall Group Holding Company (Consolidated) or at a Subsidiary level (including mini balance sheets at sub class level, if needed).
  - Change in balance sheet values e.g over 1 year for Solvency II Capital.
  - All items in Balance sheet are consistently valued based on the new/revised or simulated FX rates and yield/stock index curves at future time periods
  - Using whatever Accounting system required (GAAP, SAP, Solv II, IFRS)
- Future Income Statements
  - Again at whatever level of granularity required, consistent with balance sheets
  - Gross and Net (net of whatever reinsurance structure or Structures in mind)

Output Delivered …cont

- Cash Flow Statements(s)
  - Output split between Underwriting and cash from General Operations
  - Can be grouped by Currency for Treasury Management
  - Can also track cash flows and relationship between the Operationl Fund and a TAKAFUL Fund
- Compliant Data to prepare for Rating Agency Capital Calcs
  - Produce data for use in AM Best and S&P CAR scores
  - Similar approach planned for Solvency QIS calcs and Full internal Model

DFA and Risk Management (2)