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C-ROSS Implication on Investment

- Aligning the Investment Strategy with C-ROSS

Bonny Fu 付振平

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Contents

- Introduction of C-ROSS Regime
- Asset Side Capital Charge under C-ROSS
- Aligning the Investment Strategy with C-ROSS

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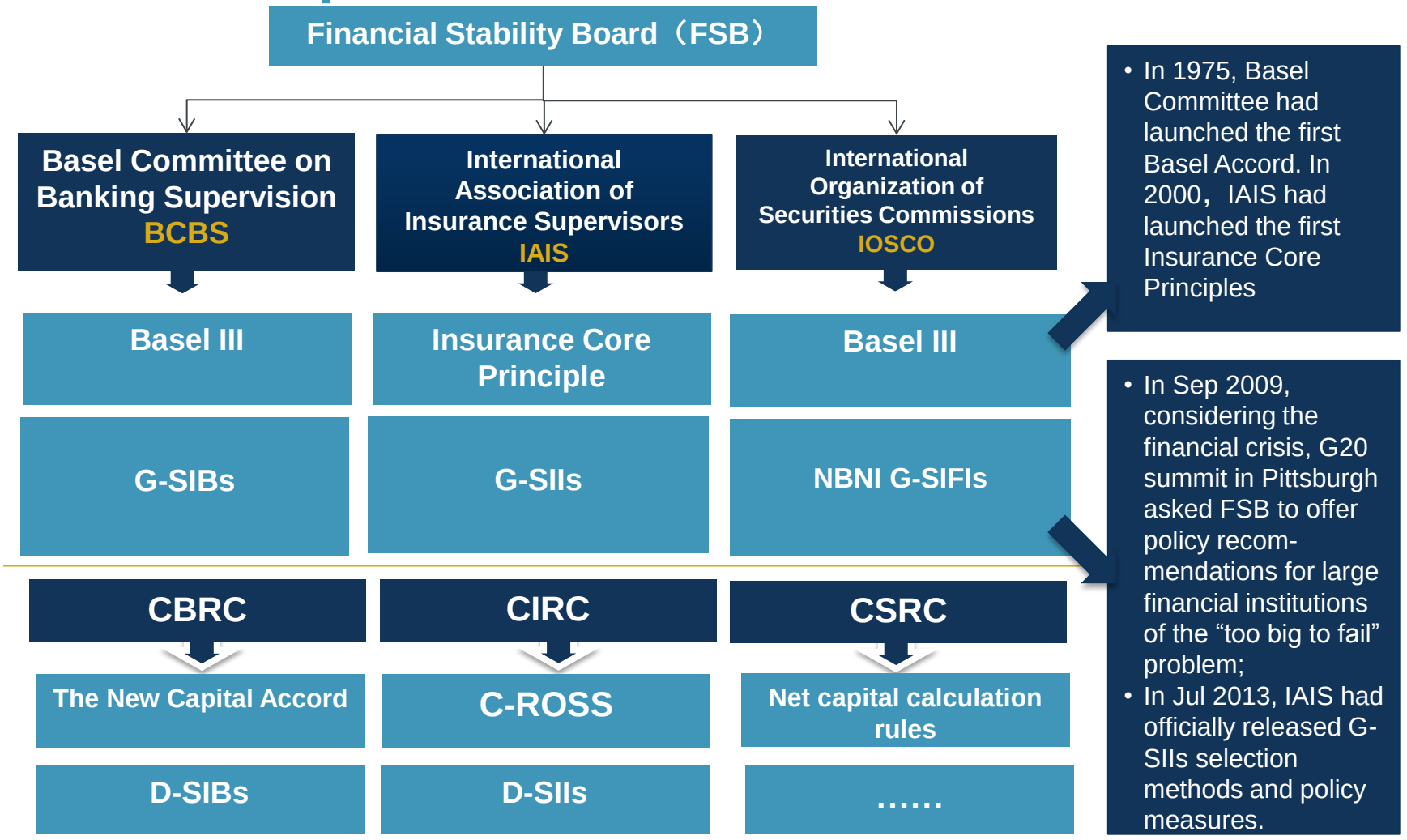
Introduction of C-ROSS Regime

International financial supervisory system and the development



Background of C-ROSS Development

■The increasing risk scale and difficulty of risk management of insurance industry

■Market-oriented strategy of “release the top-end, hold the back-end”

■International insurance regulatory rules become increasingly convergent.

■Banking has unified regulatory rules.

■There is no unified rules for insurance industry all over the world

■C-SI is not suitable for emerging market.

■It is urgent to enhance risk management of insurance industry

■Develop a risk oriented solvency system

Chinese

Full name：中国风险导向的偿付能力体系

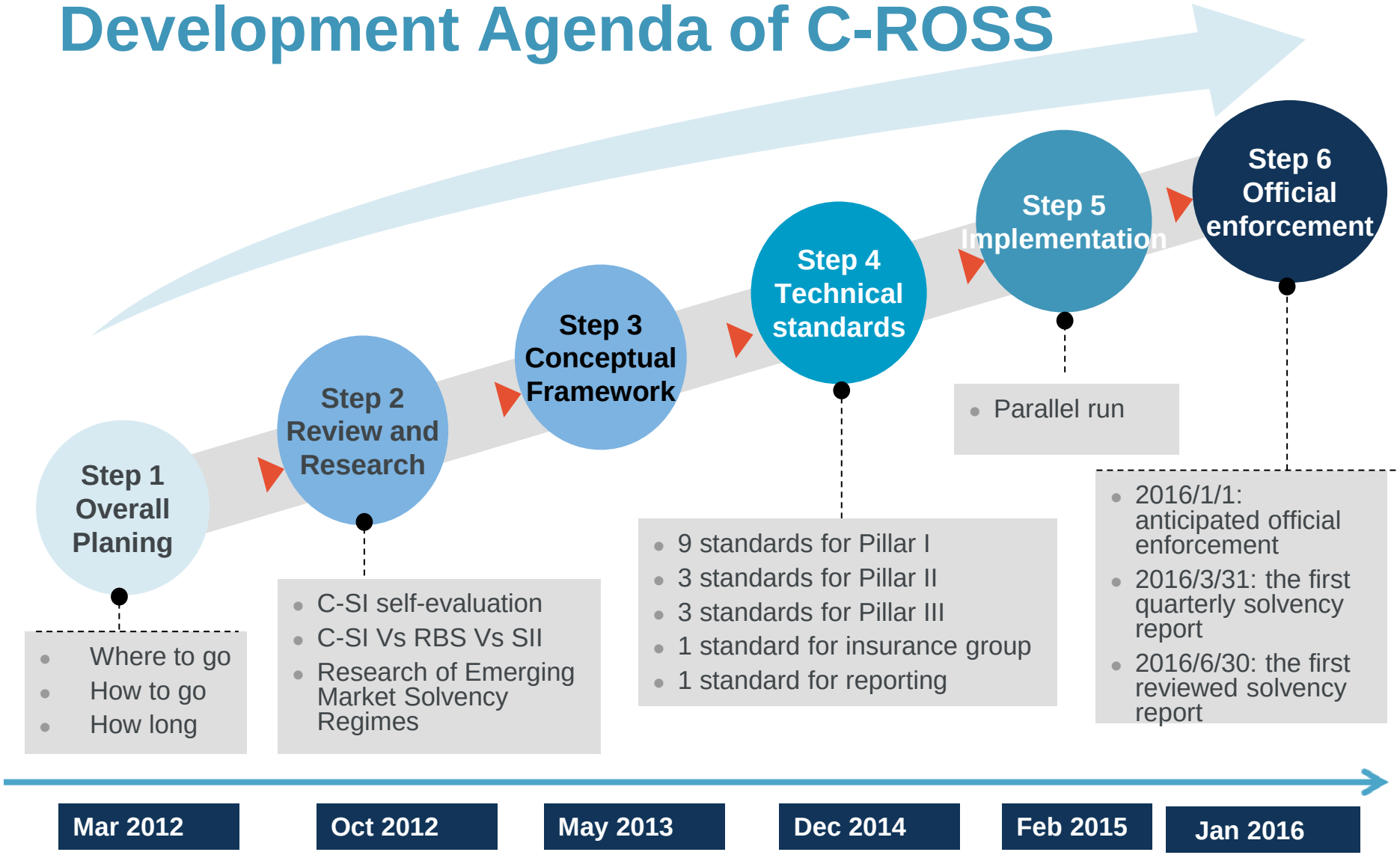
Simplified name：偿二代

English

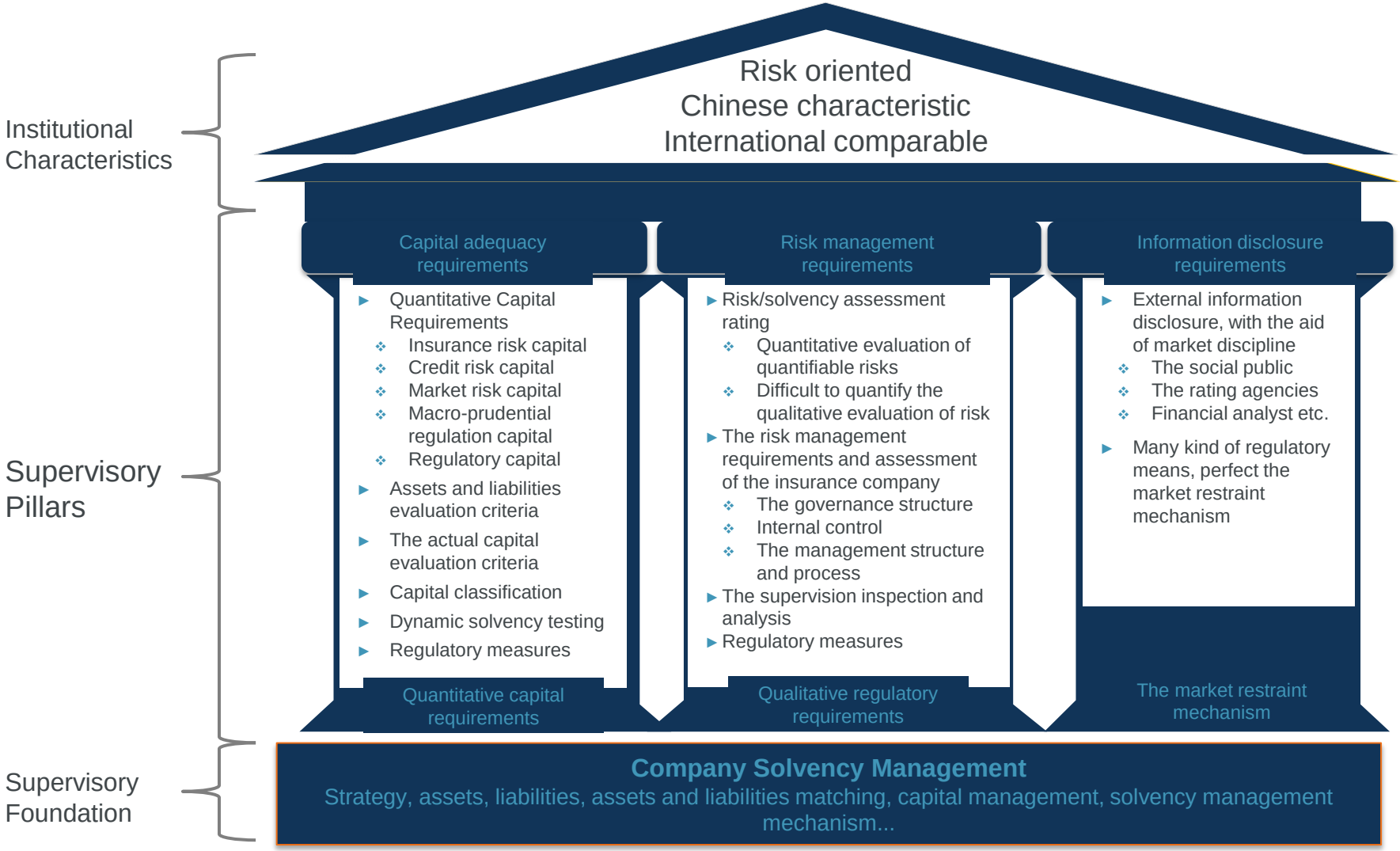
Full name ： China Risk Oriented Solvency System

Simplified name ： C-ROSS

Development Agenda of C-ROSS



Conceptual Framework: Three-Pillar Framework



Conceptual Framework

- On Feb 13 2015, CIRC has issued 17 regulatory rules of “China Risk Oriented Solvency System”(C-ROSS).(Notice of the issuance of insurance company solvency regulatory rules (No. 1-17))
- On Feb 15 2015,CIRC issued the notice of relevant issues of C-ROSS implement in transition period, and raise some request for the commissioning of C-ROSS.

Pillar I

Actual Capital
- Measures the admitted assets and admitted liabilities based on accounting value
- Capital tiering classifications based on characteristics of capital

Minimum Capital Requirements
- Contains quantifiable risks, as well as the MCR of risk control and any capital add-ons
- Contains loss absorbing rules

Life insurance liability valuation
- Contains best estimate and risk margin and TVOG calculated by factor methods.
- Assumptions should satisfy the regulatory criteria.

Insurance Risk (Non-life)
- Calculate premium risk, reserve risk and catastrophe risk separately.
- Aggregate premium risk and reserve risk first, and then aggregate them with catastrophe risk

Insurance Risk (Life)
- Each sub-risk is calculated by scenario approach
- Aggregate loss ratio risk, lapse risk and expense risk capital requirement

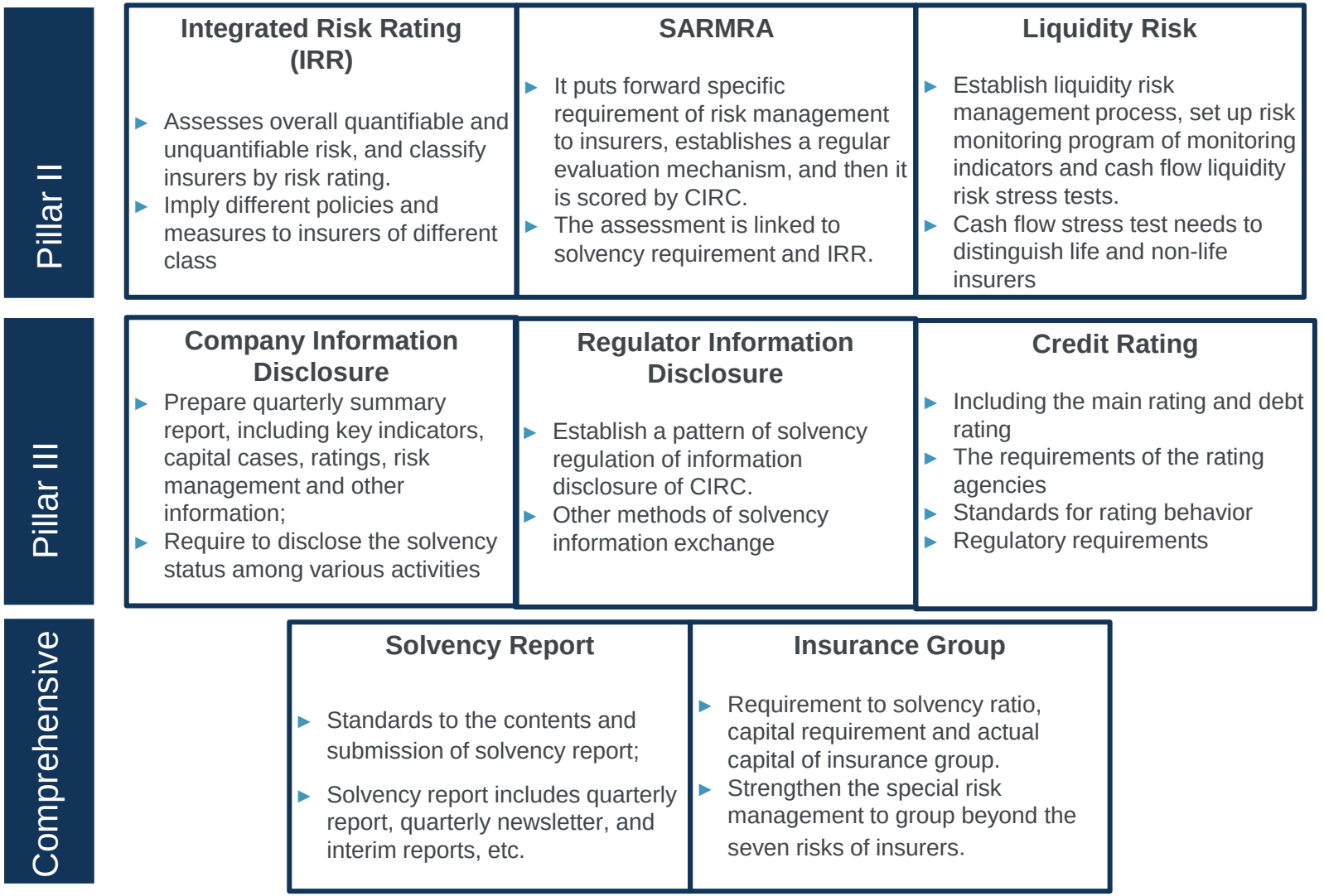
Insurance Risk (Reinsurance)
- Proportional reinsurance can refer to the approach of direct insurance; non-proportional has an separate factor.
- Aggregate proportional and non-proportional business according to business lines.

Market Risk
- Risk exposure determined based on accounting value instead of admissible proportion under previous solvency regime
- Interest rate risk is classified by life, non-life and reinsurance company.

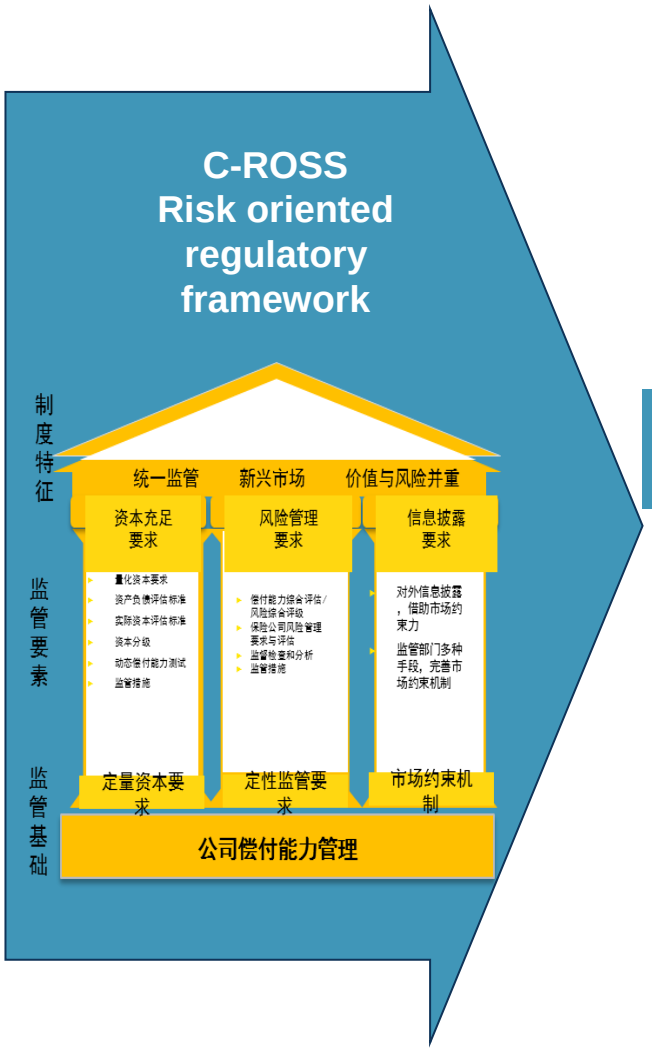
Credit Risk
- Determine factors according to the asset credit situation, credit risk exposure determined based on accounting value
- Includes credit spread risk and default risk, and aggregate them by correlation matrix

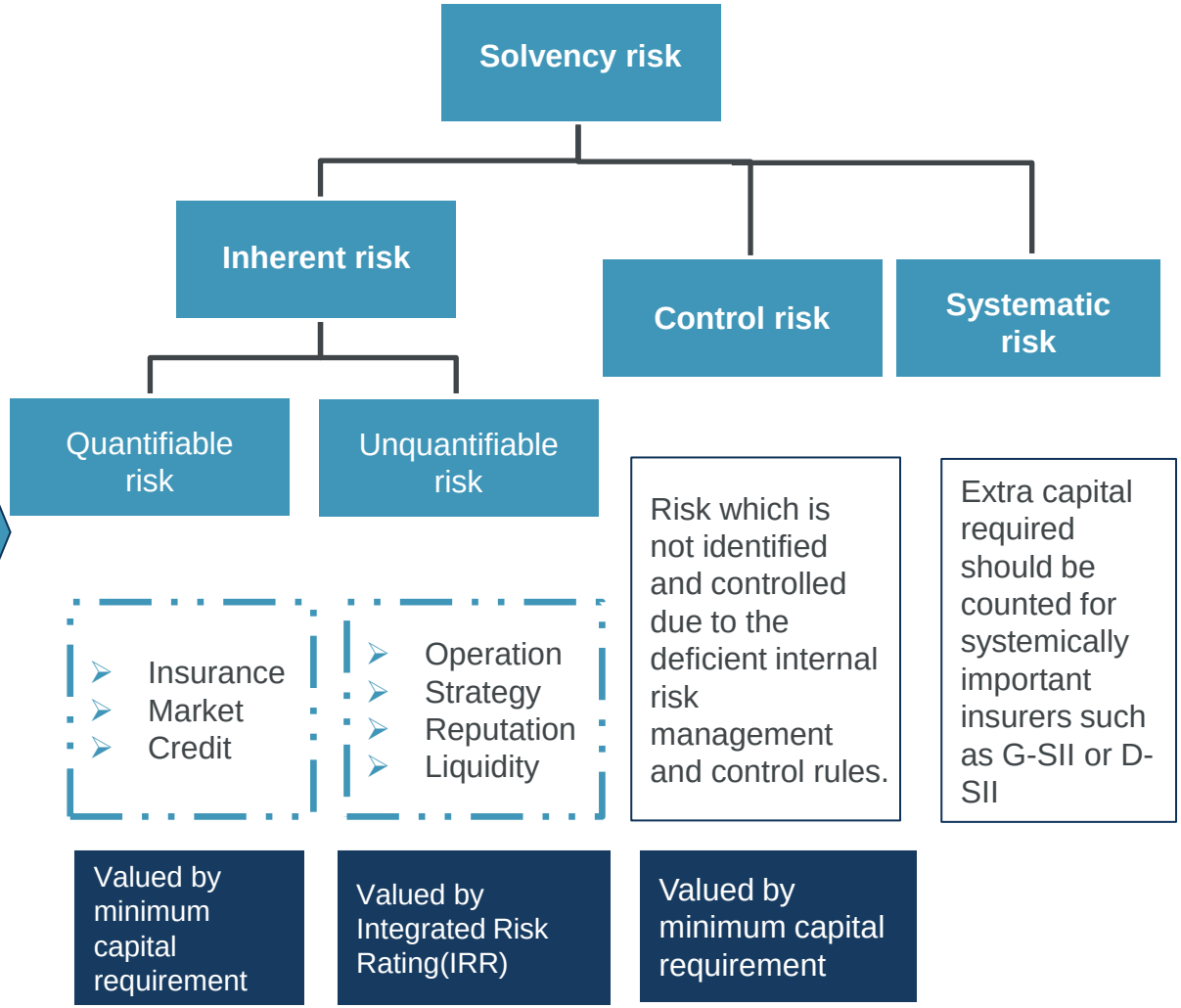
Stress Test
- It is classified by life and non-life insurer， and it sets stress test under the basic scenario and stress scenario.
- Given some simplified approach of the anticipation of capital required.

Conceptual Framework



Risk classification and management





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Asset Side Capital Charge under C-ROSS

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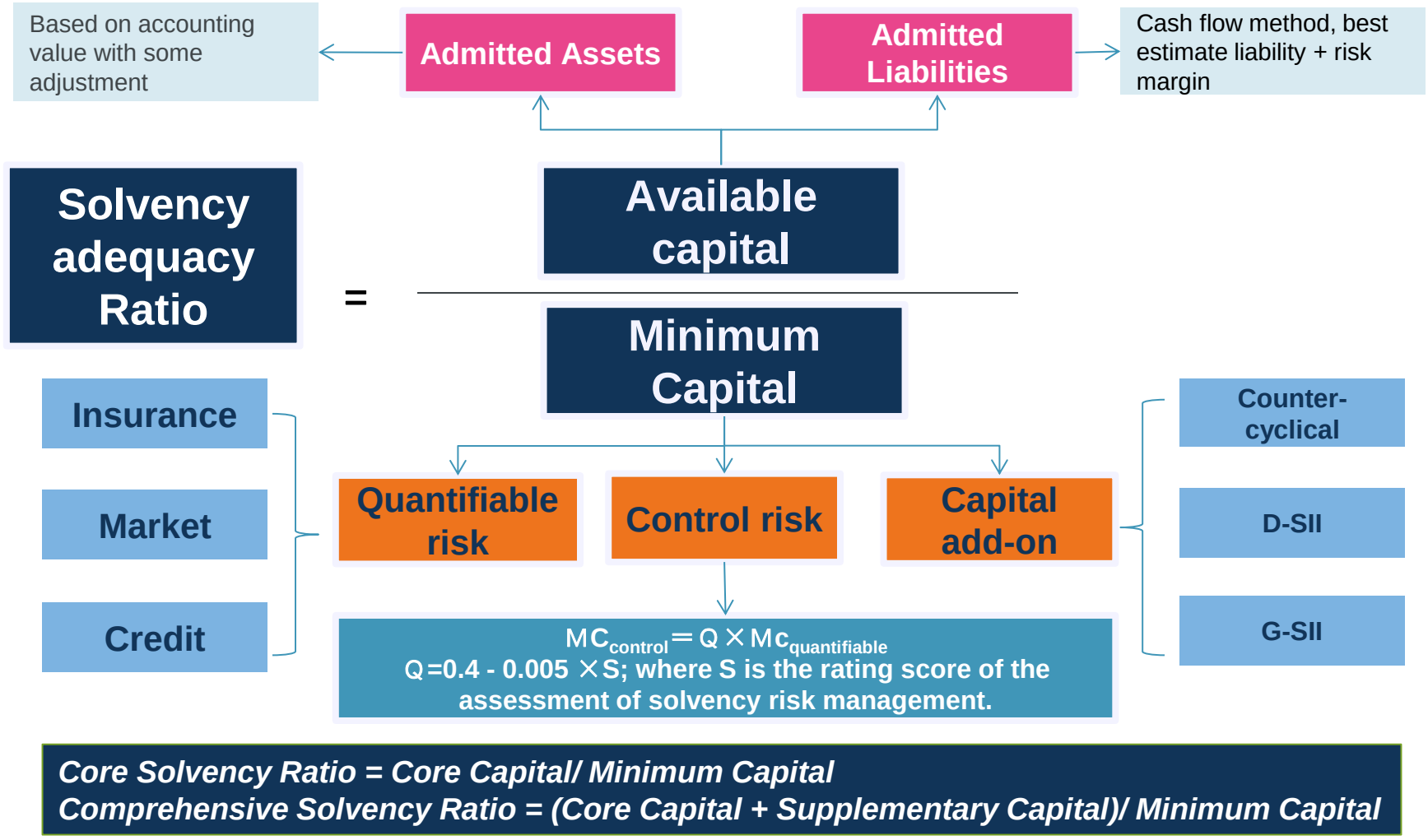
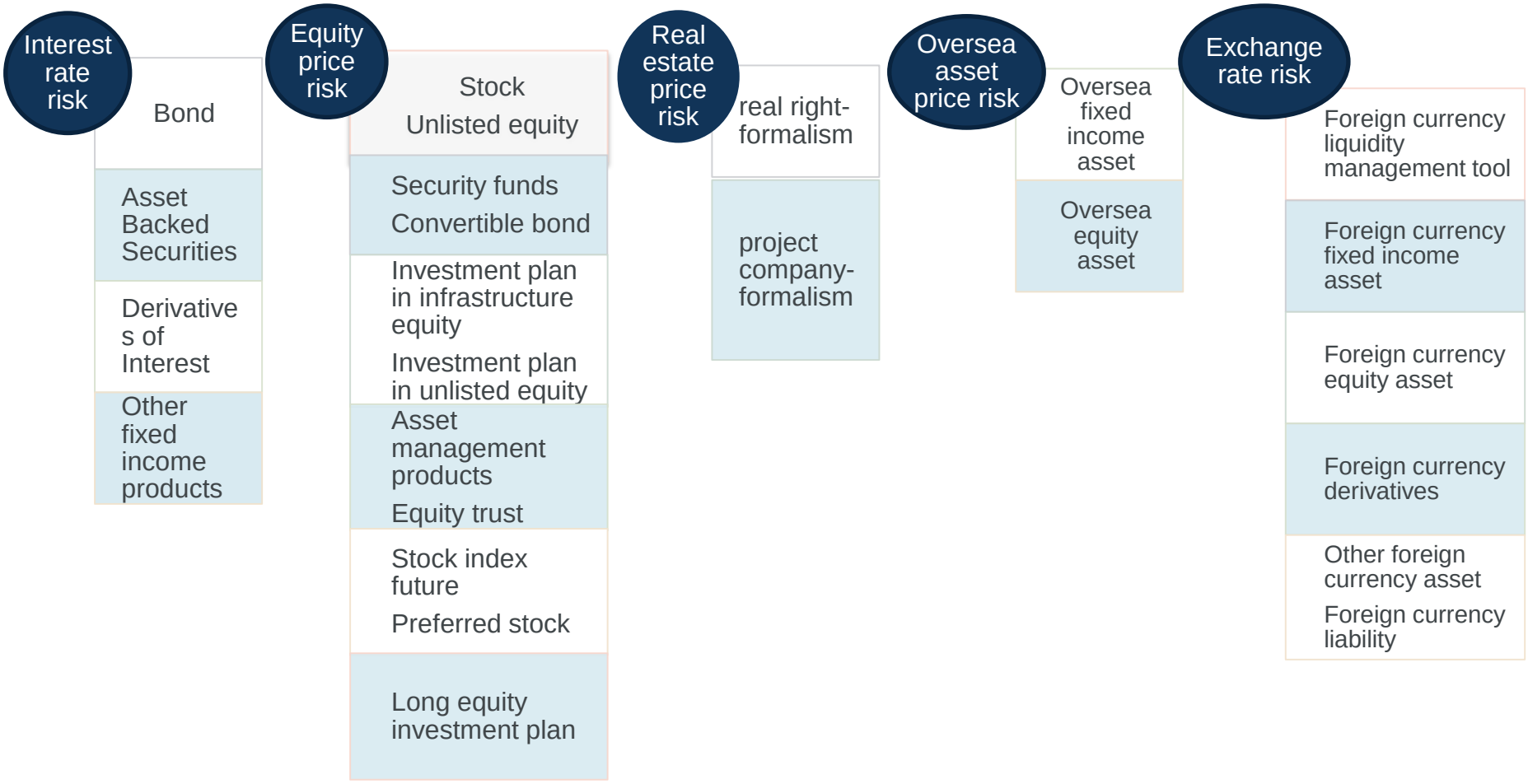
Solvency Ratio Requirement



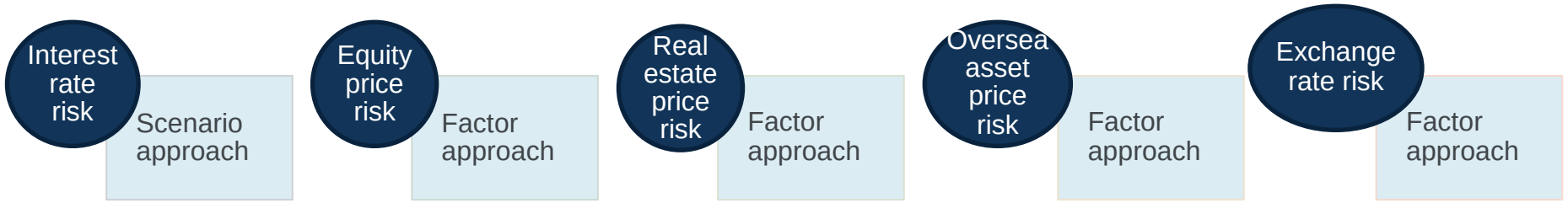
Core Solvency Ratio = Core Capital/ Minimum Capital
Comprehensive Solvency Ratio = (Core Capital + Supplementary Capital)/ Minimum Capital

Minimum Capital of Market Risk

The calculation of asset market MC include:



Capital Charge for Market Risk



Formula of factor approach:

- MC_{market}＝EX×RF; where, $MC_{marketi}$ is the minimum capital of a kind of risk; EX is the exposure of this kind of asset.
- RF is the risk factor, $RF=RF_0×(1+K)$; RF_0 is the basic factor; K is the character factor, where K∈[-0.25, 0.25]；

For the interest rate risk for life insurance company, MC is calculated by scenario approach, the formula is:

$$MC_{interest}= Max[(AA_{basic\ scenario}- PV_{basic\ scenario}) - (AA_{adverse\ scenario}- PV_{adverse\ scenario}$$

- The adverse interest rate of asset＝（$1+SF_1$）×risk free interest rate；
- The adverse discount rate of cash flow of life insurance business＝（$1+SF_2$）×discount rate of cash flow

Minimum Capital for Credit risk

Credit risk MC

Credit spread risk MC

- Bonds, include financial bond, corporate bond, etc. except convertible bond
- Asset Backed Securities, include special management plans of securities companies and credit asset-backed securities
- Fixed income trust；
- Other fixed income products

Counterparty default risk MC

- Cash and liquidity management tools
- Fixed income investment asset
- Exchange forward and interest rate swap
- Policy loans
- Reinsurance assets, including accounts receivable reinsurance reserve, reinsurance receivables
- Premiums receivable
- Interest receivable
- Other receivables and prepayments
- Debt Guarantee

Calculation of Market Risk MC:

- The formula of each asset MC is:

$$\mathrm{MC}_{\mathrm{credit}} = \mathrm{EX} \times \mathrm{RF}$$

- Where EX is exposure, credit risk exposure equals to the admit value without any special regulatory;
- RF is risk factor, $\mathrm{RF} = \mathrm{RF}_0 \times (1 + \mathrm{k})$;

RF0 is basic factor; K is character factor

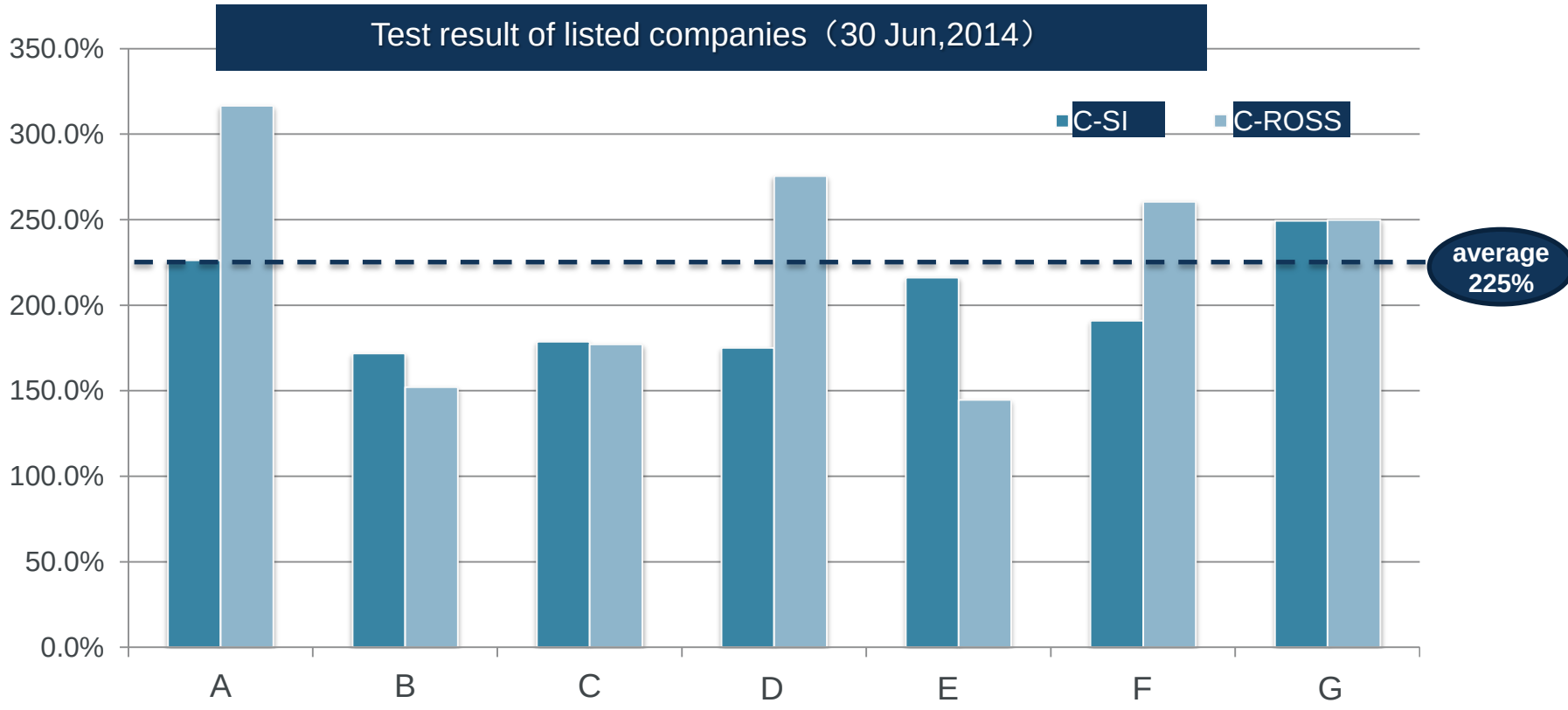
- The calculation of credit risk MC is：

$$\mathrm{MC}_{\text{信用}} = \sqrt{\mathrm{MC}_{\text{利差}}^2 + 2\rho \times \mathrm{MC}_{\text{利差}} \times \mathrm{MC}_{\text{交易对手违约}} + \mathrm{MC}_{\text{交易对手违约}}^2}$$

C-ROSS Opportunities and Challenges

--Capital release, no pressure of financing, largely develop business

- In accordance with the field testing results of 30 Jun 2014, after C-ROSS has been implemented, most of life insurers' solvency ratio will be strengthened. The reason of the improvement is that (1) the release of residual margin in comparison to PRC GAAP reserve; and (2) the loss absorbing effect from the product types with variable benefit.
- Both available capital and minimum capital increases and become more fluctuating compared to Solvency I. Hence the solvency management will become more challenging.



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Aligning the Investment Strategy with C-ROSS

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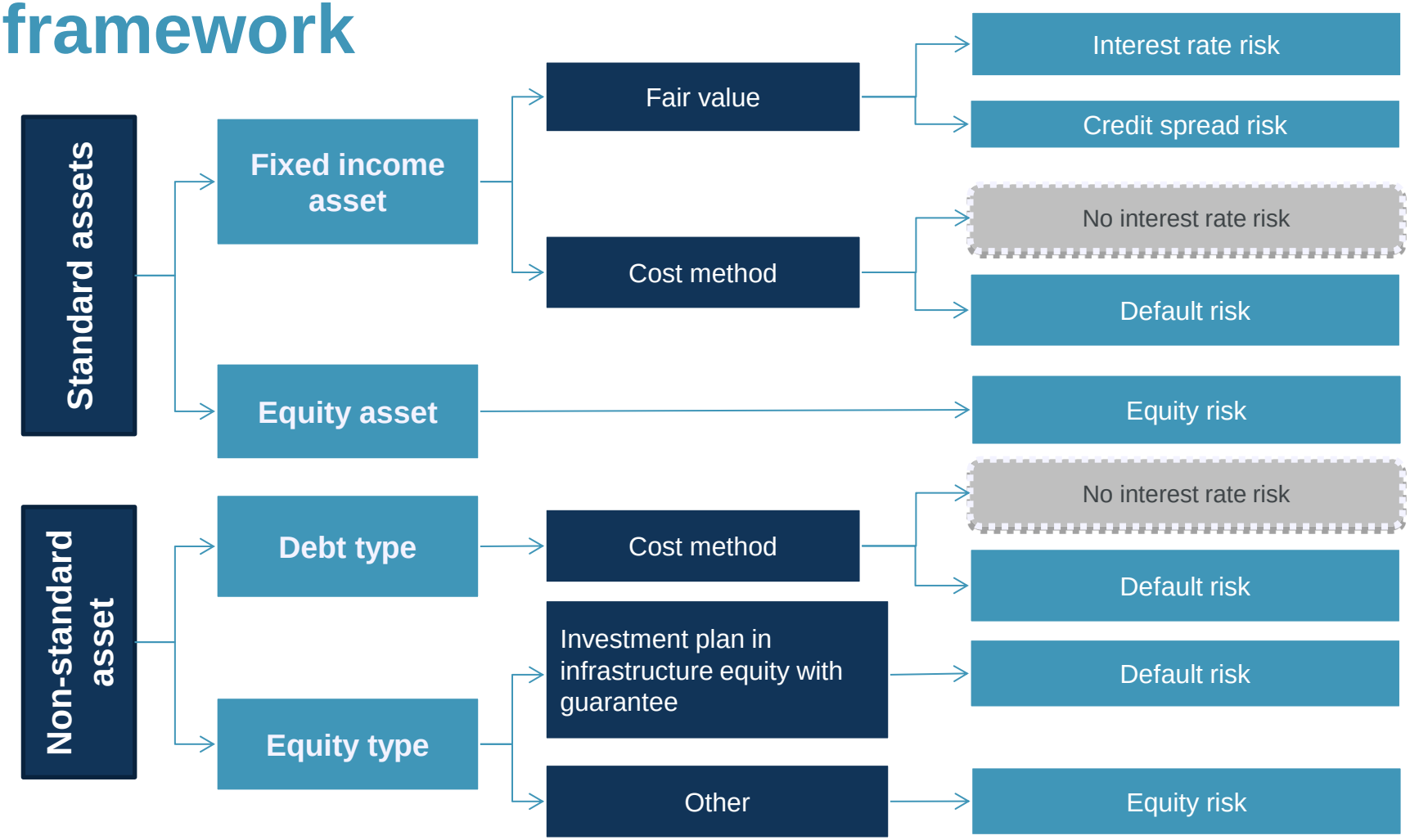
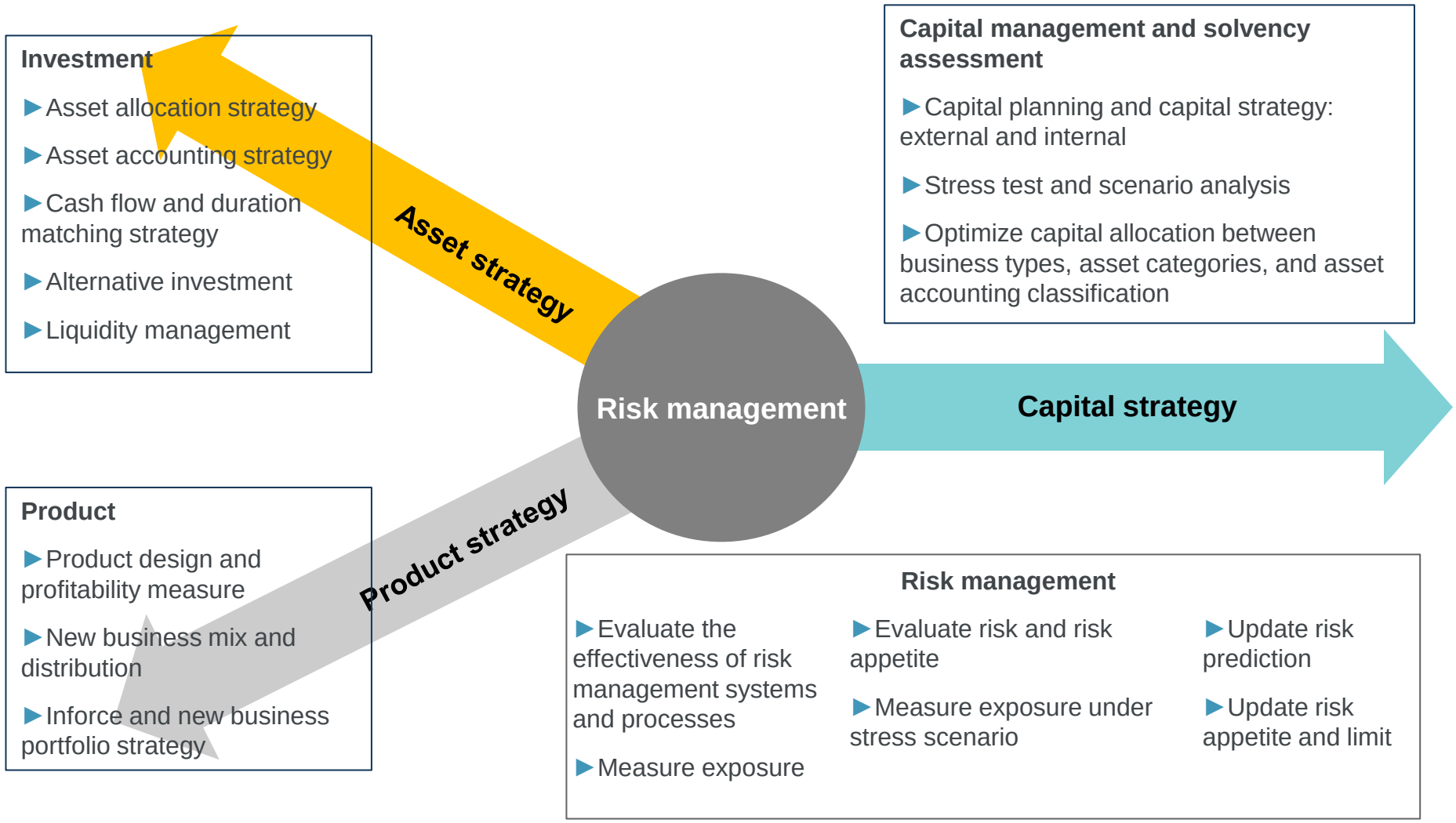
C-ROSS market risk capital charge framework



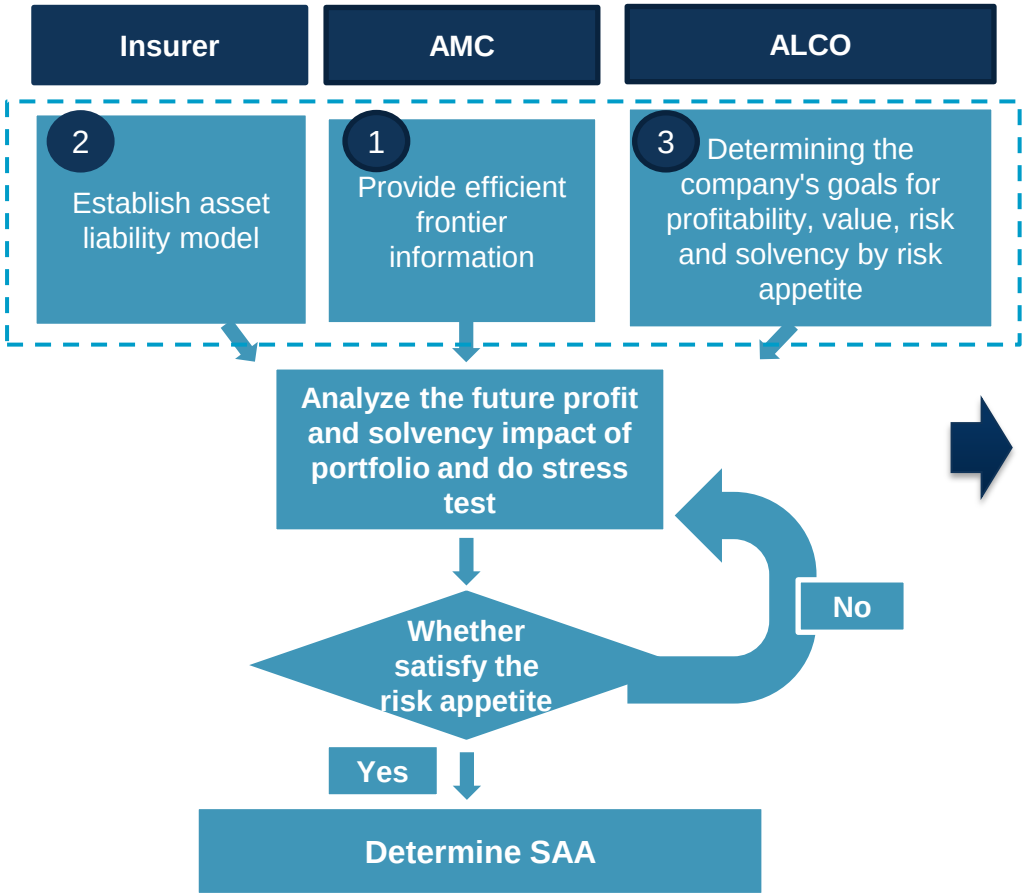
C-ROSS requires company to align investment, product strategy, capital management and risk management.



Asset Liability Management and Strategic Asset Allocation

Risk appetite under C-ROSS

Optimize the choice of SAA, which is based on the combination of the efficient frontier, asset and liability management model and risk appetite, and by running ALM model, based on the risk appetite, to determine the optimal asset allocation on the efficient frontier portfolio, so to maximize the company's earnings targets.



1 Efficient frontier is determined by the investment team, they build several portfolio, and according to the risk to choose some portfolio; which is always based on the operation strategy, and choose some asset portfolio on the efficient frontier to test model.

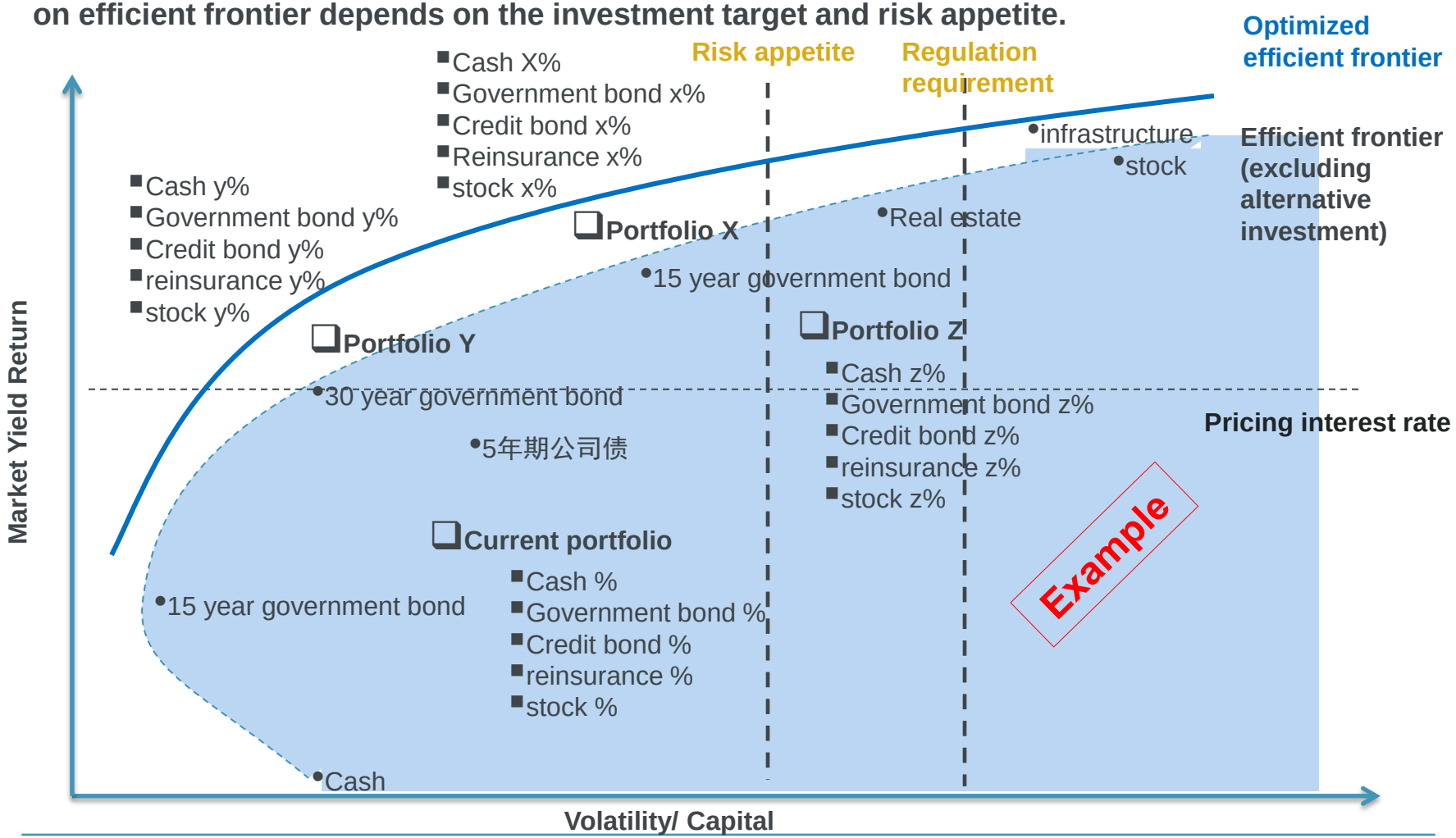
2 A good ALM model will realize the link between asset and liability, and make a comprehensive, dynamic, predictive asset and liability management.

3 Company will determine the best investment portfolio according to their own strategy and consideration of capital, profit, value, liquidity, risk appetite and limit.

Strategic Asset Allocation (SAA)

Determine efficient frontier and choose SAA

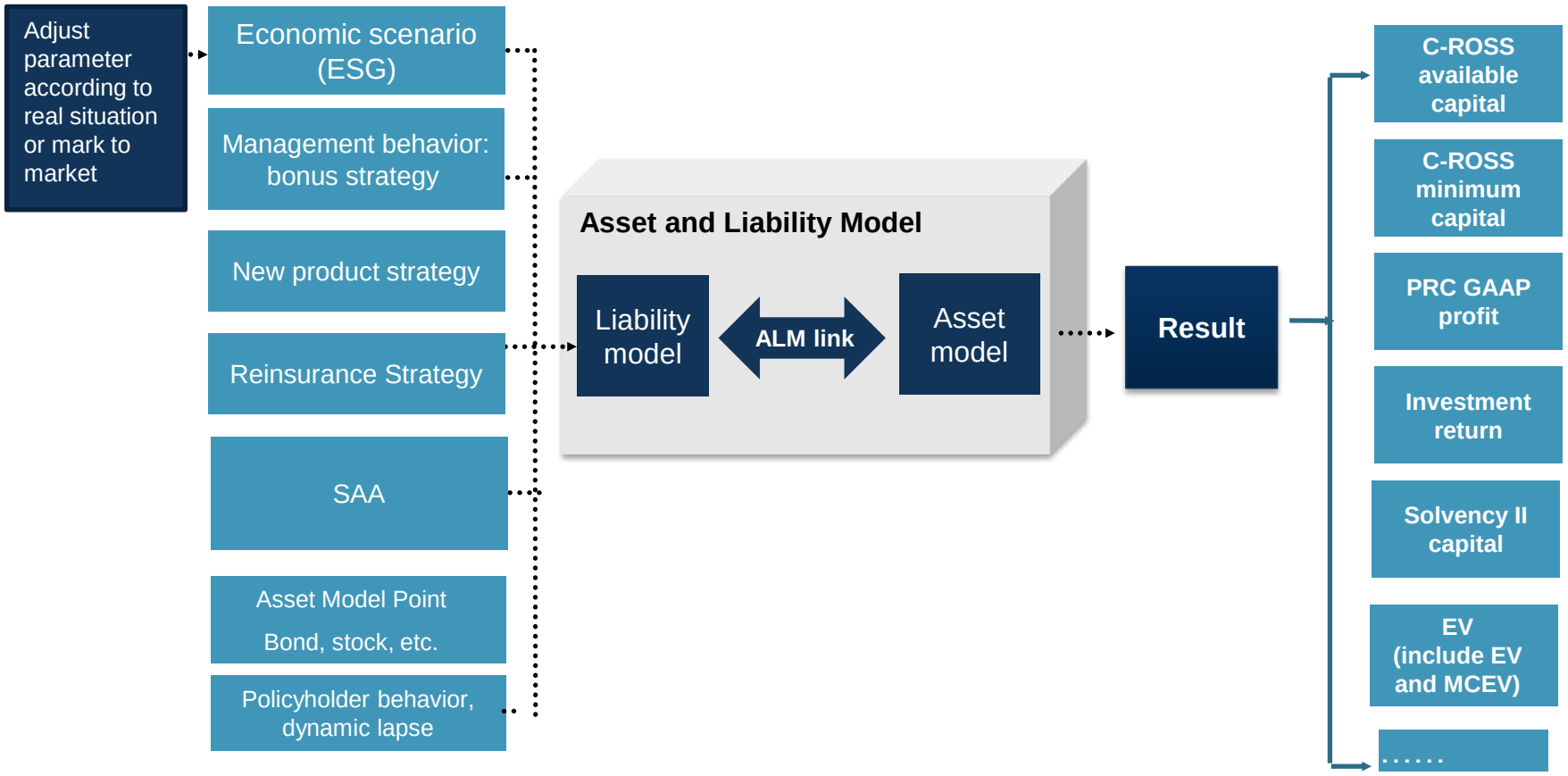
Efficient frontier reflects the top return portfolio given the level of risk, the optimized portfolio on efficient frontier depends on the investment target and risk appetite.



Asset liability management and SAA

Asset liability model is required to predict solvency under C-ROSS

Prophet ALS model is used to project the financial performance incl. C-ROSS; and evaluate the solvency and profit impact under each candidate SAA.

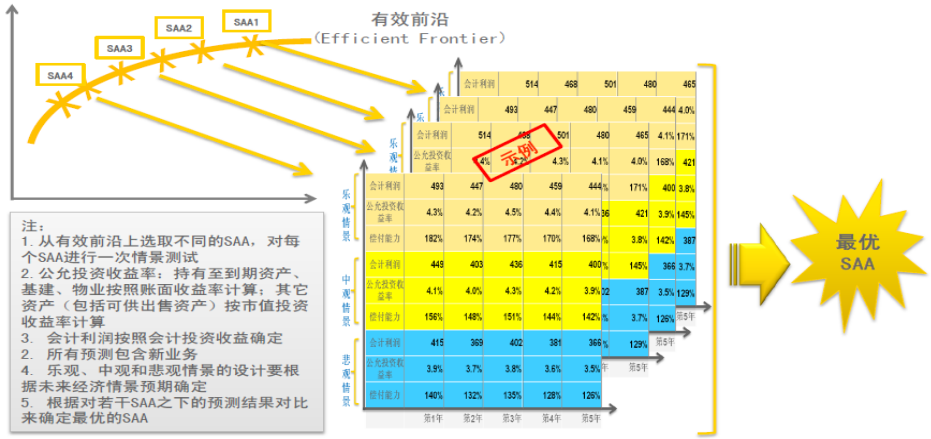


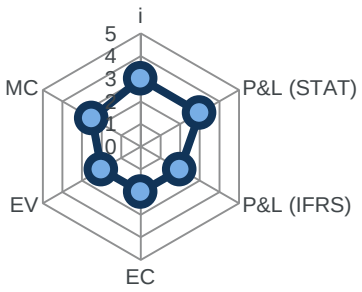
Strategic Asset Allocation (SAA)

Optimize SAA to align with risk appetite

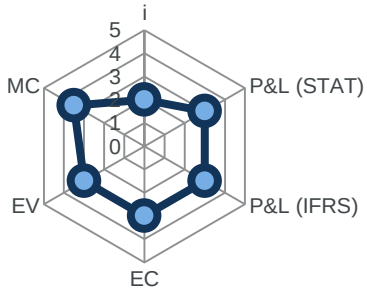
Evaluate the financial performance for the candidate investment strategies from efficient frontier (such as SAA1, SAA2) to identify the optimized SAA.

Scenario	Target	SAA1	SAA2	SAA3	SAA4	SAA5
Basic scenario	profit					
	Solvency					
	Invest return					
Adverse scenario A	profit					
	Solvency					
	Invest return					
Adverse scenario B	profit					
	Solvency					
	Invest return					
Adverse scenario C	profit					
	Solvency					
	Invest return					

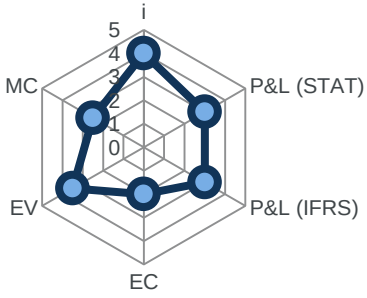




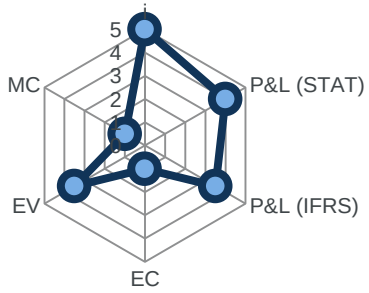
Current SAA



SAA – choice A (prudential)



SAA – choice B (positive)



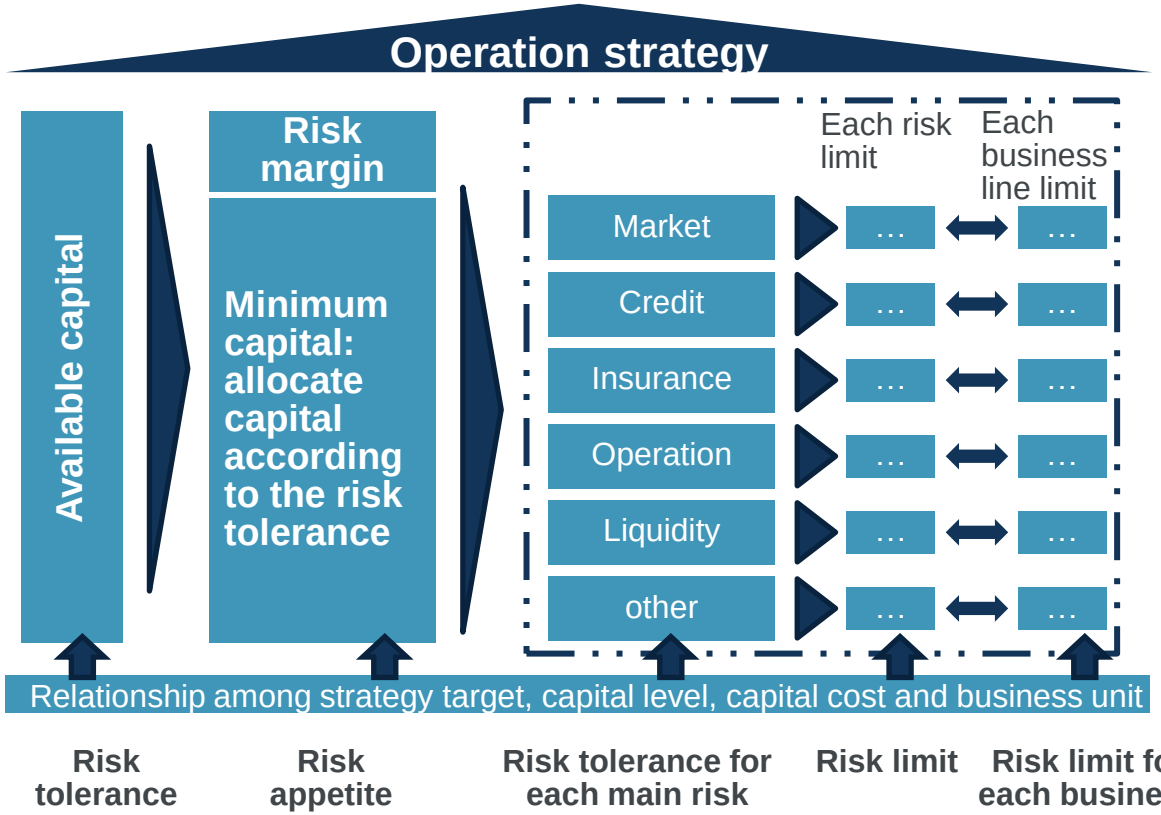
SAA – choice C (very positive)

Note : 5 point = best

- MC =minimum capital；i= long term invest return；P&L (STAT)= statutory profit and loss；P&L (IFRS) = GAAP profit and loss；EC = economic capital；EV = embedded value

Risk appetite framework

Establish a risk appetite in accordance with solvency target, and cascade to the management dimension



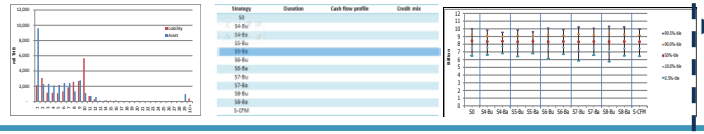
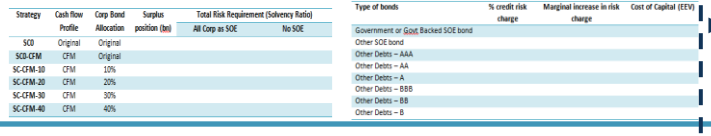
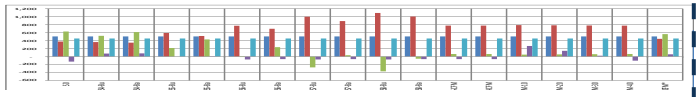
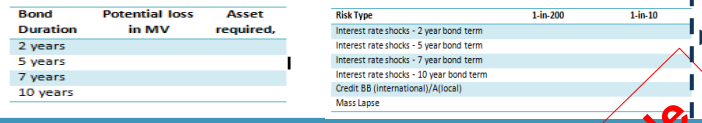
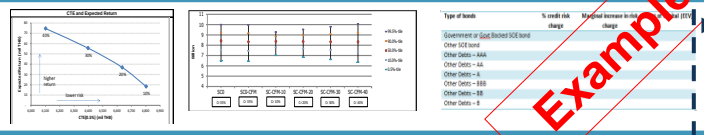
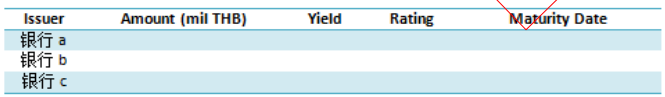
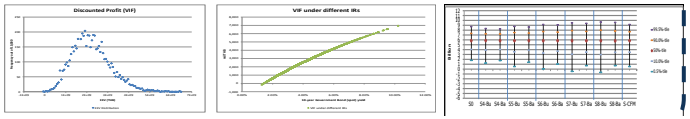
	Example
Whole limit	Limit for each risk category, asset category, business line:EaR, VaR 与 CaR
Asset concentration	% each asset ratio
	% each investment region ratio
	% each bond preference ratio
	% each credit rating ratio
	…
ALM	Equity asset term
	Mismatch limit
	…
Liability concentration	% premium ratio of each produce or business line
	% reinsurance and credit rating ratio
	…

Example

Embed risk appetite in operation and support operation

Manage risk limit | Capital planning and scenario analysis | Business planning and budgeting | Product design and pricing | SAA | Risk-oriented performance valuation

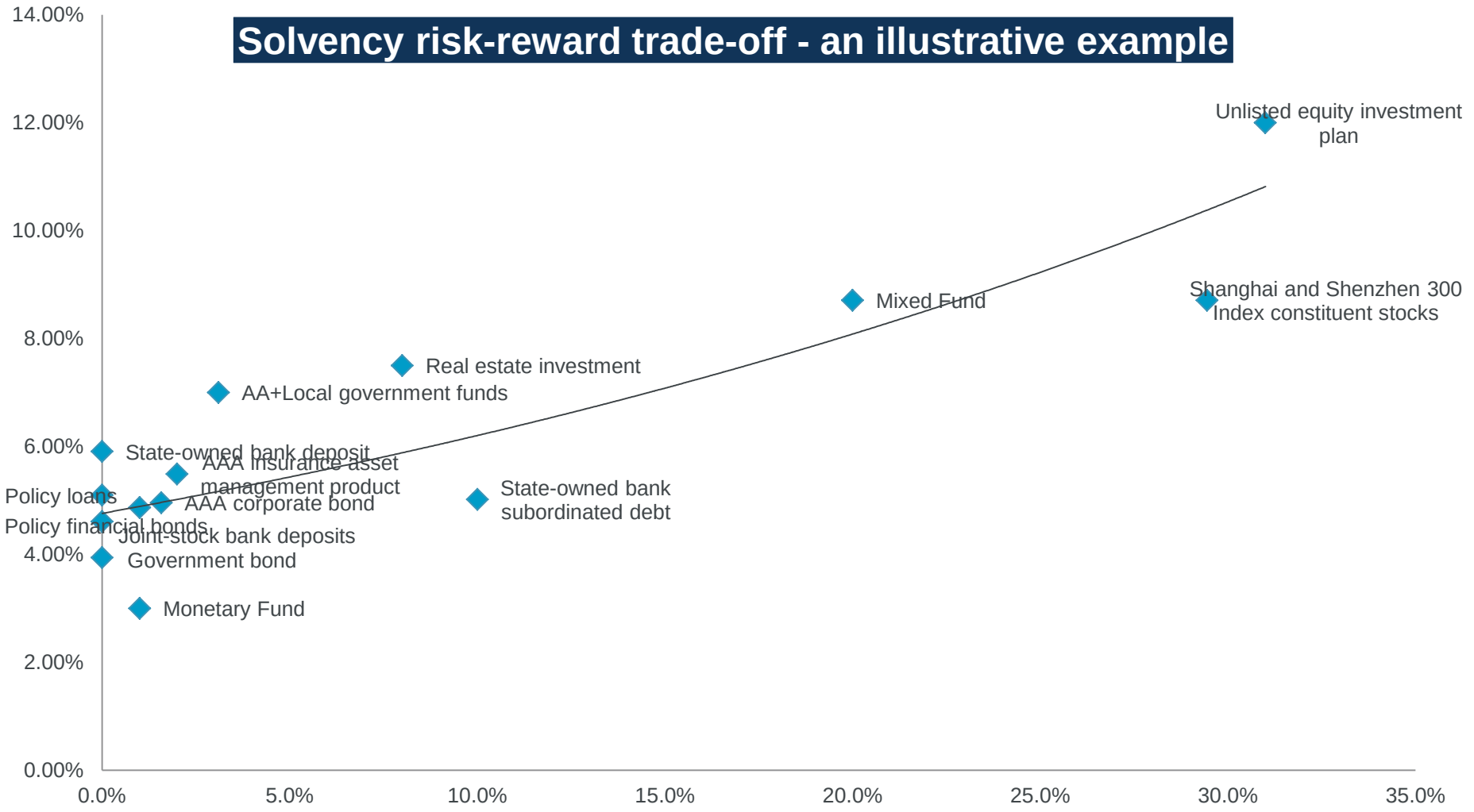
Optimize SAA within risk appetite framework

Risk appetite index	Using the ALM model test the impact of SAA to solvency, profit, EV, risk exposure	Risk valuation result and suggestion
► **Asset liability match：** (duration convexity)		► a：increase short-term investment, decrease duration gap
► **Solvency:**		► b：increase short-term bond investment to satisfy liquidity demand
► **Accounting profit:**		► c: increase high yield short-term asset to raise profit, raise the ratio of AFS, using the floating profitability to smoothing accounting profit.
► **Liquidity risk exposure:**		► d：increase short-term bond investment to respond the lapse risk
► **Credit risk exposure:**		► e：decrease x% corporate bond investment, increase x% government bond investment, maintain the current risk exposure
► **Deposit:**		► f：decrease deposit ratio, increase investment ratio
► **EV impact:**		► g：no big influence

Example

Experience sharing：

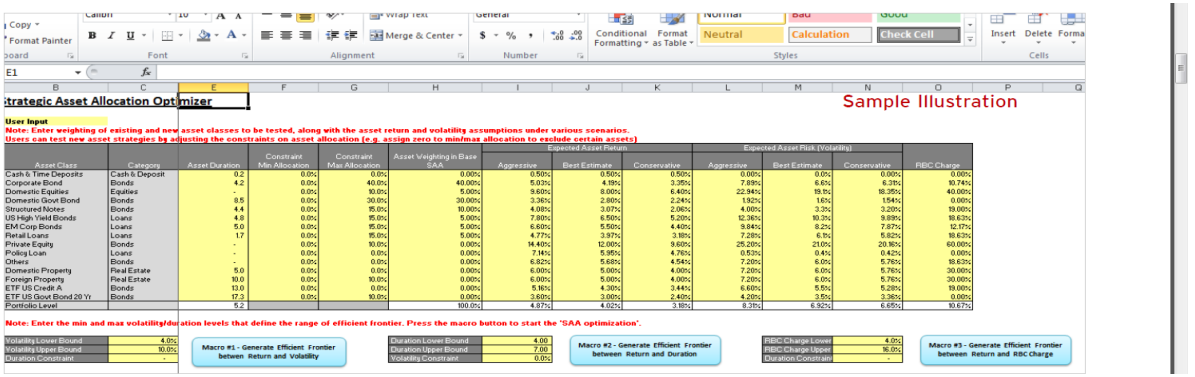
Establish the curve between investment return vs. capital charge



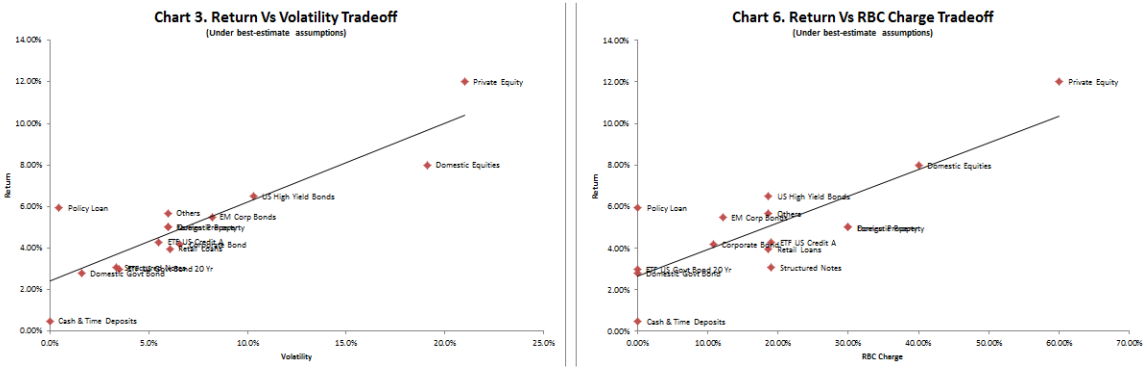
Experience sharing:

EY's optimizer to plot investment return vs. volatility (or capital charge) efficient frontier

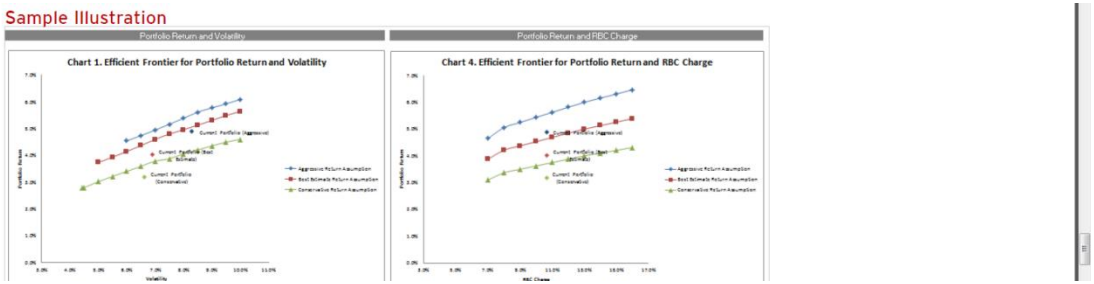
- Step 1: basic input for each asset category (1) investment return assumption;(2) risk factor (volatility or MC parameter); (3) asset allocation limit



- Step 2: reasonableness check for investment return assumption vs volatility (capital charge)



- Step 3: using Excel Solver embedded macro to find SAA on efficient frontier (1) investment return vs volatility; (2) investment return vs capital charge



Thanks

Email: Bonny.Fu@cn.ey.com