Strategic Asset Allocation for Large End-Investors: Endowments, Insurers, Pensions and Sovereign Wealth Funds by James Conklin
Guest lecture 04/15/25

Case Study: SAA for US Insurance Companies

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Talk overview

Section 1: Insurance overview

- Insurance business model
- The insurance balance sheet
- Participants

Section 2: Insurance Strategic Asset Allocation

- Why do SAA?
- How SAA? A look inside the insurance company
- Objective Functions & Constraints – where do they come from?

Section 3: Insurance SAA Process

- Project Management - Process description
- Example
- Implementation & Execution in real life

Section 4: Data input & output

- Forecasting the Future: Time Horizon & Views
- Quantitative Asset Allocation ranges
- Allocation Execution – Step by Step
- Management Influence on Strategy
- Latest Industry Trends

Section 1: Insurance overview

1.1 Insurance Business Model

1.2 The Insurance Balance Sheet

1.3 Participants in the insurance space

1. Insurance Overview

- Product & Price - What is the profit opportunity?
  - Product/Service Need
  - Mispriced / Asymmetry of risk
- Rules - What are the rules to make that profit in real life?
- Participants - Who do I need to engage with?

How does this Business Work?
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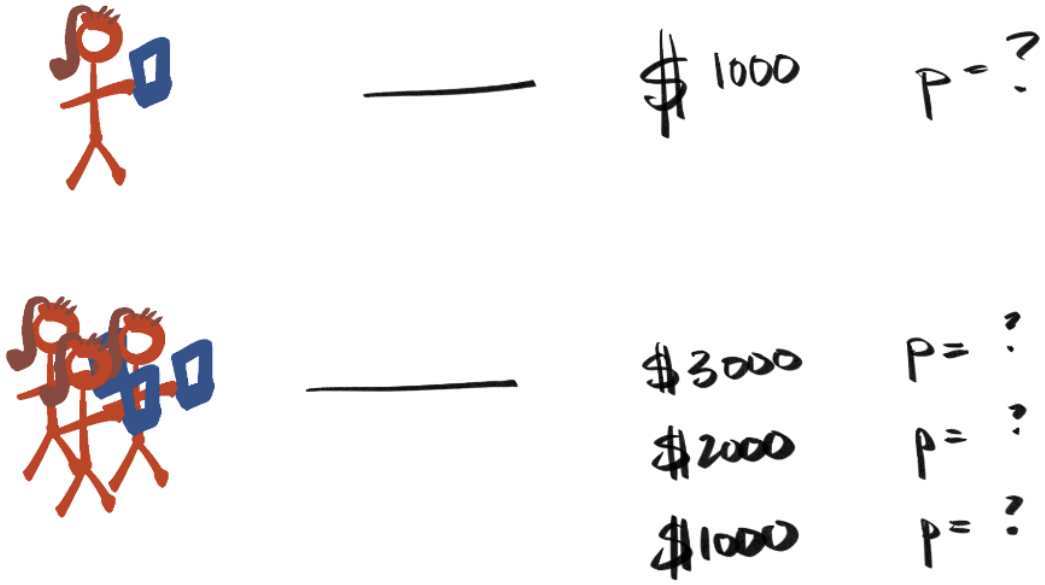
How to make a profit in insurance markets?

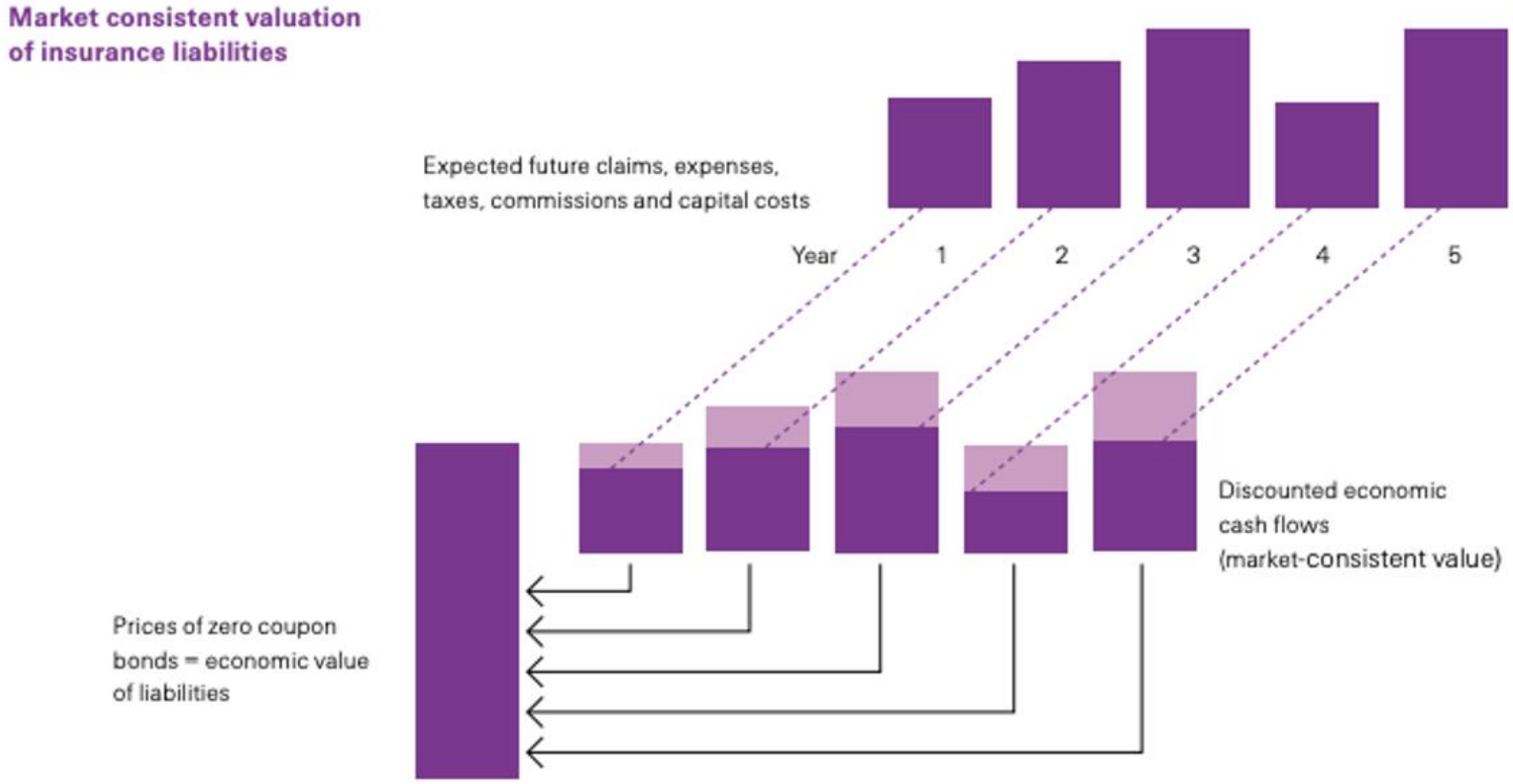
1.1 Insurance Business Model

- Life & Retirement vs Property & Casualty pricing
- Direct vs reinsurance pricing

- Law of large number allows to price on averages.
- Underlying sample distribution and correlation will determine stability of average



1.1 Insurance business model



Source: Swiss Re – EVM: measuring economic performance solvency
https://www.swissre.com/dam/jcr:5802e9ba-a7c6-48b3-bb6d-0765e033fcfa/2023-evm-measuring-economic-performance-solvency.pdf

1.2 Why look at the Insurance Balance Sheet?

Situation

Investors evaluate their investments using balance sheets

- What is being evaluated? And how?
    - This determines Participants in industry
    - Determines objective function of Participants

Complication

Insurance financials work different than standard banking

- Why? → Different business model

Insurance financials include a broader set of performance metric, some might not be understood by all participants.

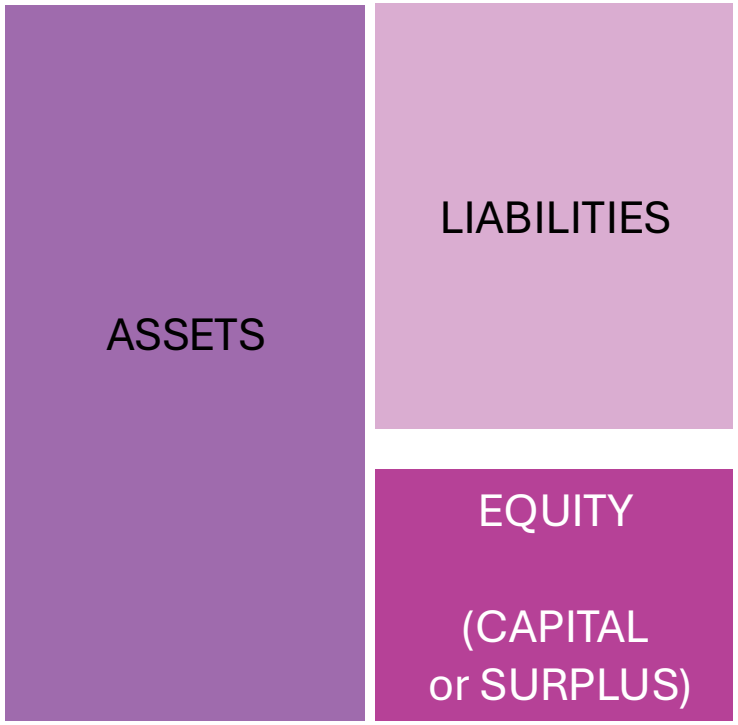
- So how do we measure success i.e. evaluate an investment?

Resolution

- ➢ Identify Participants
- ➢ Identify rules by looking at how valuations work in insurance

1.2 Ins Overview – Insurance Balance Sheet

Market consistent valuation of assets and liabilities across all businesses and product lines



- Different institutions have different accounting practices
- Different regions have different accounting practices
- …both for assets and liabilities

Source: Swiss Re – EVM: measuring economic performance solvency
https://www.swissre.com/dam/jcr:5802e9ba-a7c6-48b3-bb6d-0765e033fcfa/2023-evm-measuring-economic-performance-solvency.pdf

1.3 Participants in the insurance space

#	Participant	Types
1	Capital Markets	"The street" - primary market - capital investors
2	Owner	Public
		Private
3	Insurance Company management	Board
		CEO / Executive Team
		CFO
		Treasurer
		CIO
		ALM
		CAO
		CUO
4	Rating Agency	Insurance license: AM Best; S&P
		Capital: Equity & Credit Rating of insurance company business debt (S&P / Moodys / Fitch)
5	Regulator	Capital solvency: Financial business practice license (US RBC / solv2)
		Financial Market Risk rules adherent –
		Financial reporting accuracy (Accounting principles US GAAP / IFRS etc.)
		Market risk (SEC / BMA / PRA)
		L: Underwriting practice license (NAIC / PRA)
		L: Broker engagement (state regulator – 2004 Eliot spitzer)
6	Policyholder	Life / Retirement / Property / Casualty / Health
7	Agent / Broker	On behalf of policyholder or insurer. Inhouse, external, etc.
8	Other Insurance Companies	Reinsurance transactions - Private or Public/ Lloyds
		PRT / Stable Value Wraps
9	Financial Markets	Investment Universe for Asset portfolio - Primaries and Secondaries
		Portfolio Managers, Traders, CIOs, Creidt / Equity Research analysts
10	Financial Intermediaries	Banks / Consultants / Asset Managers etc.

Week 1: Course Overview

We will seek to model large end-investors' portfolio choice problems as constrained optimization problems

These constrained optimization set-ups will reflect their objectives and the institutional/organizational contexts they inhabit

To pose differentiated optimization set-ups, we need to characterize:

- Who are the end-investors in terms of their institutional features?
- What are their objectives, how are they organized?
- What assets do they hold?

Source: James Conklin Lecture Material week 1 p. 9

1.3 Participants in the insurance space – on the liability side

Policyholder

Policy holder Objective:

- Wants to get paid as soon as a loss occurs, without delay to the full amount of damage.

Agent / Broker

Agent / Broker Objective:

- Earn on commission or spread. Incentivized to generate volume and higher transaction prices.

Insurance Co Management

- Chief Underwriting Officer
- Chief Actuary
- Chief Financial Officer / CEO
- ALM

Insurance Company's Objective:

- CUO: Win Business opportunities – volume and transaction price targets
- Chief Actuary: Identify all key risks and price correctly and within company targets
- CFO: Hit company targets given by CEO
- ALM: Manage both sides of B/S risk and strategy

Source: James Conklin Lecture Material week 1 p. 9

1.3 Participants in the insurance space – on the Ownership side

The Street / Capital Markets

Owners

Insurance Co Management
- Board of Director
- Chief Financial Officer / CEO
- Chief Financial Officer

Capital Markets' Objective:

- Maximize return on Capital

Owners' Objective:

- Maximize long-term wealth

Insurance Company's Objective:

- Board of Director: Set company targets and goals
- CEO: deliver and communicate company goals
- CFO: Hit company targets given by CEO

Source: James Conklin Lecture Material week 1 p. 9

1.3 Participants in the insurance space – on the Asset side

The Financial Markets

Financial Intermediaries

Insurance Co Management
- Chief Financial Officer
- Treasurer
- Chief Investments Officer
- ALM

Financial Markets' Objective:

- Maximize return on Investments

Financial Intermediaries' Objective:

- Earn on commission or spread. Incentivized to generate volume and higher transaction prices.

Insurance Company's Objective:

- Board of Director: Set company targets and goals
- CEO: deliver and communicate company goals
- CFO: Hit company targets given by CEO

Source: James Conklin Lecture Material week 1 p. 9

1.3 Participants in the insurance space – Business Environment

The Regulator

The Rating Agencies

Insurance Co Management
- Chief Financial Officer
- Treasurer
- Chief Investments Officer
- ALM

The Regulator's Objective:
- Protect Policyholder's interests
- Protect Financial Markets health

The Rating Agencies' Objective:
- Help financial investors make better informed risk decisions both on market and liability side

Insurance Company's Objective:
- Board of Director: Set company rating targets and chooses regulatory environment
- CFO: Engages with Regulator and Rating Agencies.
- CRO: Calculates and monitors Risk targets to be compliant to rules
- Treasury: Maintains Liquidity and Solvency standards dictated by rules

Source: James Conklin Lecture Material week 1 p. 9

Section 2: Insurance Strategic Asset Allocation

2.1 Why do SAA?

2.2 How SAA? A look inside the insurance company

2.3 Objective Functions & Constraints – where do they come from?

2. Insurance Strategy & Math

- Why SAA?

- Which objective function & constraints?
  - Participants
  - Rules

- How SAA?
  - Time horizon / Views / Model

How does this Business Work?

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How to SET an insurance business strategy

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How to make a profit in insurance markets?

2.1 Why do SAA?

- SAA is the roadmap for everyone to follow
- *More complexity in insurance*
  - *# of Participants and their interests*
  - *# rules from Participants*
  - *Broad spectrum of Participants with little to no domain overlap*
    - *Who understands the holistic picture at the top?*
- *Different time horizons across and for single participants*
- *Identify common denominators in one system*
  - *Systemic risk?*
  - *Embedded hidden factor risks*
    - *Financial market risks in liabilities*
    - *Non financial risks in assets (timber)*
- Optimize then set unified strategic agenda and business objectives translated into one common language using different agents within the insurance company

2.2 Participants and Rules - A look inside the insurance company

- Metrics defined by Owners
  - What is the return metric?
    - NII vs total return
  - What is the volatility metric?
    - Earnings vs economic volatility?

- Company goals set by Owners / Company targets defined Executive Management / Objective Function defined by CFO
  - What is objective?
    - Max absolute return, capital adjusted or min volatility? Max solvency? Min drawdown?
  - Scope of optimization?
    - Surplus or asset underlying

2.2 Rules and Constraints: Where do they come from?

Features	#	Participant	Types
Owner	1	Capital Markets	"The street" - primary market - capital investors
	2	Owner	Public Private
Business Environment	3	Insurance Company management	Board CEO / Executiv CFO Treasurer CIO ALM CAO CUO
	4	Rating Agency	Insurance lice Capital: Equity
	5	Regulator	Capital solven Financial Mark Financial repo Market risk (SE L: Underwriting L: Broker engag
Liabilities	6	Policyholder	Life / Retireme
	7	Agent / Broker	On behalf of po
	8	Other Insurance Companies	Reinsurance t PRT / Stable Va
Assets	9	Financial Markets	Investment Un Portfolio Managers, Traders, CIOs, Creidt / Equity Research analysts
	10	Financial Intermediaries	Banks / Consultants / Asset Managers etc.

- Balance sheet
  - Unrealized G/L (CFP constraints)
  - NII floor / target
- Shareholders
  - Return on capital
  - Profitability
- Business / CFO
  - Business expense projections
  - Underwriting expenses etc
- Regulatory capital and constraints
  - Solvency / available capital measures
  - Legal entity requirements
  - State laws
  - Country laws
- Rating agency capital
  - Rating / capital measures

2.2 Rules and Constraints: Where do they come from?

Features	#	Participant	Types
Owner	1	Capital Markets	"The street" - primary market - capital investors
	2	Owner	Public Private
Business Environment	3	Insurance Company management	Board CEO / Exec CFO Treasurer CIO ALM CAO CUO
	4	Rating Agency	Insurance L Capital: Eq
	5	Regulator	Capital sol Financial M Financial r Market risk L: Underwri L: Broker er
Liabilities	6	Policyholder	Life / Retire
	7	Agent / Broker	On behalf o
	8	Other Insurance Companies	Reinsuranc PRT / Stable
Assets	9	Financial Markets	Investment Portfolio Managers, Traders, CIOs, Creidt / Equity Research analysts
	10	Financial Intermediaries	Banks / Consultants / Asset Managers etc.

- Liabilities / ALM
  - Duration, Greeks
  - Underwriting segment laws
- Policyholders
  - Claims payment cash flow projections
- Financial markets
  - Sourcing capabilities (cap on asset classes)
  - Concentration risk (cap on asset classes)
- Risk
  - Market risk (valuation) / drawdown
  - Liquidity risk
  - Credit risk
  - Interest rate risk
  - Event – risk
  - Policyholder risk
    - Lapse risk / Cat event risk

Section 3: Insurance SAA Process

3.1 Project Management - Process description

3.2 Example

3.3 Implementation & Execution in real life

3. Insurance SAA Process

How does this Business Work?

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How to set an insurance business strategy

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How to EXECUTE an insurance business strategy?

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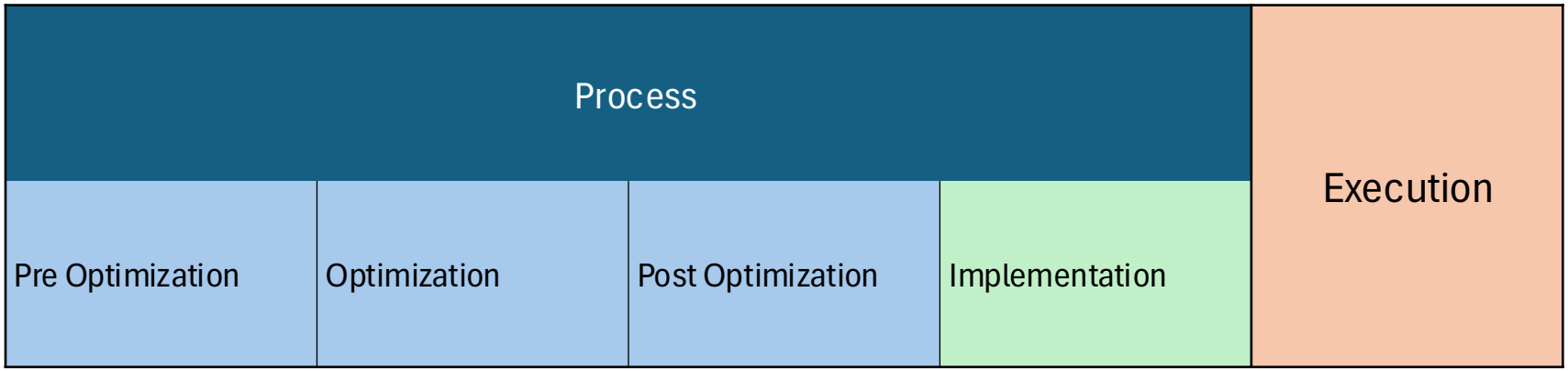
How to make a profit in insurance markets?

3.1 Project Management – Project Stages Overview

Set:

- business environment,
- Management Objectives
- Constraints,
- Corporate Governance & Process

then kick off exercise:



Source: JP Morgan Asset Management

3.1 Pre Optimization: Project Management

Pre Optimization

- Data & Metrics definition:
  - Define asset universe
  - Liability data
  - Rating agency / Regulatory models/rules
- Input into optimization:
  - Asset views
  - Liability views
  - Objectives / Constraints

- Asset Views models
  - Economic scenario generator?
  - Scenario augmentation (Gramm-Schmidt orthogonalization)
  - Cashflow pricing?
  - Factor model with betas?
- Liability pricing / benchmark model
  - Liability replicating benchmark
  - Cashflow matching?

- What:
  - Define scope of optimization (entity?)
  - Define Investment Universe
  - Business env: capital / accounting
  - Risk & Regulation
  - Internal views and tactical objectives
  - Time horizon
- Data need:
  - Portfolio Holdings
  - Liability data
- Metrics:
  - Benchmark data of investment universe
  - Benchmark data of liability replication
- Views – holistic !
  - *Asset risk, return, correlation views
  - *Liability risk, return, correlation forward views

Source: Swiss Re – EVM: measuring economic performance solvency
https://www.swissre.com/dam/jcr:5802e9ba-a7c6-48b3-bb6d-0765e033fcfa/2023-evm-measuring-economic-performance-solvency.pdf

3.2 Example Pre-Optimization : Client RFI

RFI for General Account Strategic Asset Allocation (SAA) Analysis

(1) Asset holdings data
We would request either CUSIP-level holdings or assets grouped by detailed sector, maturity, and rating splits (ideally "as of" the same recent date as the liabilities below). The data would ideally include the following at least as of 12/31/24 or more recent :

- CUSIP
- Market Value
- Book Value
- Market Yield
- Book Yield
- Price and/or current units
- Sector / Sub-sector
- Asset class / sub-class
- Stated maturity / Effective maturity
- NRSRO ratings
- Rate duration
- Spread duration
- Key Rate Duration (KRD) information

To the extent that there are multiple legal entities or assets (e.g. any hold co assets), please indicate this in the holdings that you provide and we can then construct an appropriate view of your starting asset portfolio.

(2) Liability Information
Please provide either liability cash flow projections OR liability durations / KRDs along with total liability valuation if easier. This can be for your total liabilities, or split by entity, LOB, etc., whatever is the most relevant way to view your combined companies.

Should you have any US Life company subsidiaries, please also optionally include the latest IMR balances.

(3) Capital
For each relevant regime, so we would need the most recently available capital worksheet in order to model impacts. We would need this for every relevant entity, but we can use some assumptions if not fully available. Please consider sending RBC, AM Best, and S&P models, as applicable.

(4) Constraints
Please provide any relevant constraints, whether they are regulatory or simply to reflect your views or preferences. These may include, but are not limited to:

- Investment policy constraints or portfolio guidelines – These may limit allocations to certain asset classes, require minimum average quality, disallow assets below certain ratings, limit issuer exposures, and enforce duration or KRD limits.
- Rating agency and regulatory capital constraints – (e.g. a specifying a BCAR or RBC floor that must be maintained)
- Other regulatory constraints – anything not already covered by the IPS or guidelines (e.g. state statues)
- Carbon reduction: Should we model a solution that reduces the current corporate carbon intensity and if so how should we measure that and project future reductions?
- Liquidity constraints – We would want to understand any preferences for limits on allocations to new illiquid assets. These may also differ between the GA portfolio and Hold Co portfolios, to the extent you want to model both on a combined basis.

(5) Objectives
Key metrics to be maximized/minimized or adjusted over multiple iterations, typically one from each category:

- Return: Expected return, yield to worst, OAS, book income,
- Economic risk: asset or surplus volatility, max drawdown, simulated tail risk
- Capital and Accounting: RBC/BSCR Ratio, BCAR/S&P ratios, STAT income/distributable earnings, ALM cash flows, realized gain/loss limits

Permitted Asset Classes
Please feel free to note below which areas are not of interest to you. Alternatively, we could use your Investment Policy Statement / Guidelines as a starting point for defining the eligible investments universe. If there are asset classes or strategies available to you that we have not listed, please let us know along with the expected return for those strategies.
I added some exemplary "Exclude" below – please feel free to delete.

3.2 Example Pre-Optimization : Client RFI

Asset classes		Exclude?
Fixed Income	Cash	
	Treasuries	
	USD Agencies	
	Taxable Munis	
	Tax Exempt Munis	Exclude
	IG Public Corporates	
	IG Private Placement Corporates	
	Bank Loans	
	IG EMD Corporates	
	IG EMD Sovereigns	
	HY EMD Corporates	
	REIT debt & preferreds	
Securitized and Mortgage Loans	Agency CMOs	
	Agency RMBS	
	Agency CMBS	
	Non-Agency RMBS Prime	
	Vanilla ABS (i.e. AAA / AA)	
	Private / lower quality ABS (A / BBB or HY)	Exclude
	Non-Agency CMBS	
	CLOs (AAA or AA)	
	CLOs (A or lower)	
	Senior Private CMLs	
	Residential Mortgage Whole Loans	Exclude

Risk Assets	Levered Senior CML Fund	
	High Yield Corporate Credit	
	US Public Equities	
	Non-US DM Public Equities	Exclude
	Emerging Markets Public Equities	Exclude
	Convertibles	Exclude
	Hedge Funds	
	Senior Direct Lending / Pvt Credit	
	Mezzanine Direct Lending	
	Event-Driven / Distressed Credit	
	Infrastructure Equity	
	Infrastructure Debt Loans	
	Transportation Leasing	
	Preferred Stocks	
	Private Equity (VC / Buyout / Growth)	
	Public REIT Equity	
	Private REITs	
	Core Real Estate Equity	
	Opportunistic Real Estate Equity	
	Residential Real Estate Equity	
	Mezzanine Real Estate Debt	

3.2 Example Pre Optimization: Asset Class Assumptions

Asset classes	Yield (unhedged)	Currency hedge	Default adjustment	Expected Return	Volatility	Duration	Sharpe Ratio
USD Cash	4.36%	-	0.00%	4.36%	0.5%	0.3	0.0
USD Treasury	4.25%	-	0.00%	4.25%	2.9%	3.4	0.0
USD Agency	4.57%	-	0.00%	4.57%	2.2%	2.7	0.1
USD Taxable Muni	5.04%	-	0.00%	5.04%	3.3%	4.0	0.2
USD Corp A-AAA	5.14%	-	-0.10%	5.05%	4.7%	5.3	0.1
USD Corp BBB	5.64%	-	-0.29%	5.35%	5.8%	5.8	0.2
USD EMD Corp	5.62%	-	-0.15%	5.47%	6.0%	3.3	0.2
USD EMD Sov	4.69%	-	-0.02%	4.67%	4.3%	4.3	0.1
USD Corp HY	8.19%	-	-1.53%	6.66%	7.6%	4.3	0.3
GBP Cash	3.09%	0.84%	0.00%	3.93%	0.6%	0.4	-0.7
GBP Corp A-AAA	5.30%	-0.09%	-0.08%	5.12%	4.3%	4.1	0.2
GBP Corp BBB	6.32%	-0.08%	-0.26%	5.98%	4.8%	4.2	0.3
AUD Cash	2.60%	1.43%	0.00%	4.03%	0.5%	0.3	-0.7
AUD Agency	4.01%	0.45%	0.00%	4.46%	1.5%	1.9	0.1
EUR Cash	1.66%	2.54%	0.00%	4.20%	0.4%	0.1	-0.4
EUR Agency A-AAA	3.13%	1.24%	0.00%	4.37%	1.8%	2.8	0.0
EUR Corp A-AAA	3.87%	1.08%	-0.08%	4.87%	3.2%	3.7	0.2
CAD Cash	4.47%	-0.17%	0.00%	4.30%	1.2%	0.1	0.0
CAD Treasury	3.82%	0.14%	0.00%	3.96%	1.9%	2.7	-0.2
CAD Agency	3.98%	0.15%	0.00%	4.13%	2.1%	3.1	-0.1
CAD Corp A-AAA	5.08%	0.15%	-0.07%	5.16%	2.2%	2.8	0.4

Source: JP Morgan Asset Management

3.2 Example Pre Optimization: Constraints

Constraint		Group	Bermuda	UK	Lloyd's	US
Asset-Liability mismatch			+/-1 yr net duration			
1-Year 5% VaR		5%	10%	5%	5%	7.5%
S&P Asset Risk		10%				
Liquidity/Cashflow Needs			Yes - Internal and US RBC for US entity			
Reg 20			Yes	Yes		
Reg 114					Yes	
Additional Trust Fund limits					Yes	
Core Fixed Income	*Min Avg credit quality*	AA-	A+	AA-	AA-	A+
	Max BBB allocation		25.0%	10.0%	15.0%	15.0%
	Max Below IG		10.0%	5.0%	0.0%	5.0%
	Max BBB & BIG		35.0%		15.0%	
	Sector & sub-sector limits		Various per guideline			
	Inv Grade structured products	15.0%	30.0%	15.0%		20.0%
Strategic Assets	*Equities*		20.0%	10.0%	0.0%	5.0%
	HY & loans		10.0%	5.0%	0.0%	5.0%
	EMD IG	5.0%	10.0%	5.0%	0.0%	10.0%
	Real estate equity		5.0%		0.0%	
	CML	15.0%	15.0%	10.0%	0.0%	20.0%
	Direct Lending	15.0%	15.0%	10.0%	0.0%	20.0%
	Alternatives		5.0%	5.0%	0.0%	5.0%
	Total strategic assets	20.0%	45.0%	10.0%	0.0%	35.0%

Source: JP Morgan Asset Management

3.1 Optimization: Project Management

Pre Optimization

- Data & Metrics definition:
  - Define asset universe
  - Liability data
  - Rating agency / Regulatory models/rules
- Input into optimization:
  - Asset views
  - Liability views
  - Objectives / Constraints

Optimization

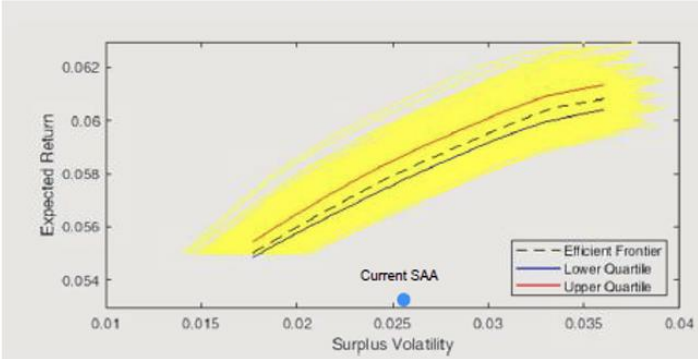
- Define Objective function mathematically
- Define Constraints mathematically
- Capture additional constraints:
- Capture different Time Horizons and views

Source: Swiss Re – EVM: measuring economic performance solvency
https://www.swissre.com/dam/jcr:5802e9ba-a7c6-48b3-bb6d-0765e033fcfa/2023-evm-measuring-economic-performance-solvency.pdf

3.2 Example Optimization: Example Data Output

Group-level results

Efficient frontier



- The efficient frontier shows the maximum return achievable for varying levels of risk
- Alongside this we show the range of simulated efficient frontiers allowing for parameter uncertainty and their interquartile range
- The table shows the output of the robust SAA process where we apply the average portfolio weights for each target return across 1000 simulated efficient frontiers
- Current portfolio sits below the efficient frontier and outside of the interquartile range allowing for parameter uncertainty
- Significant opportunity to improve return for a similar risk budget or reduce risk without giving up return

Group asset allocation

Asset Class	Current	Port A	Port B	Port C	Port D	Port E	Port F
Expected Return (%)	5.27	5.50	5.60	5.70	5.79	5.90	6.00
Asset Vol (%)	2.59	1.87	2.02	2.23	2.46	2.77	3.00
Surplus Vol (%)	2.51	1.86	2.07	2.33	2.59	2.95	3.21
Sharpe Ratio	0.36	0.62	0.60	0.57	0.55	0.52	0.51
Avg FI Credit Rating	AA-	AA+	AA+	AA	AA	AA	AA
FI Duration	2.52	2.14	2.09	2.07	2.06	2.05	2.04
Duration	2.44	1.99	1.95	1.93	1.91	1.89	1.88
Net Duration	0.65	0.19	0.16	0.13	0.12	0.10	0.09
DTS	498	213	244	267	301	352	393
VaR 95	-3.90	-2.70	-3.07	-3.46	-3.86	-4.40	-4.81
Inv Income (%)	3.20	2.69	2.85	2.95	3.04	3.13	3.19
S&P Capital (%)	6.00	8.75	9.01	9.43	9.75	9.96	10.00
BSCR FI & EQ (%)	1.43	1.72	1.89	2.01	2.11	2.21	2.27
MKT SCR (%)	12.85	7.03	7.32	7.95	8.90	10.27	11.42
Cash	13.49	11.74	11.77	11.77	11.77	11.71	11.58
Government	21.24	33.34	25.97	21.20	18.10	14.72	13.46
Agency	3.28	6.38	5.29	4.45	3.92	3.28	3.05
Corporate	33.75	18.18	24.38	27.98	29.94	32.13	32.43
MBS	7.52	7.70	8.55	8.95	9.23	9.46	9.44
ABS	1.34	0.84	1.48	1.90	2.19	2.55	2.82
CLO	11.27	6.50	6.62	6.66	6.67	6.65	6.71
CML Senior	2.66	2.84	2.72	2.69	2.69	2.75	2.82
CML Mezz	0.00	0.43	1.16	1.22	1.18	0.82	0.48
Bank Loans	1.47	0.00	0.00	0.00	0.03	0.09	0.16
Direct Lending	0.92	0.96	1.29	1.72	2.19	2.84	3.28
Infra Debt	0.00	0.04	0.10	0.24	0.46	1.02	1.57
Property	3.00	2.49	2.50	2.50	2.50	2.48	2.46
Public Equity	0.00	3.39	2.85	3.37	3.76	4.21	4.56
Private Credit Secondaries	0.00	1.39	1.58	1.62	1.65	1.73	1.80
Special Situation Credit	0.00	2.49	2.50	2.50	2.50	2.49	2.47
Transport Leasing	0.00	1.23	1.18	1.18	1.15	0.98	0.83
Infra Equity	0.06	0.06	0.06	0.07	0.07	0.07	0.06

Source: J.P. Morgan Asset Management analysis as at January 2023. Forecasts are not a reliable indicator of future performance. For a more detailed breakdown of allocation, please refer to the Appendix.
MBS = Mortgage-backed securities. CML = Commercial mortgage loan.

Source: JP Morgan Asset Management

3.1 Post Optimization: Project Management

Pre Optimization

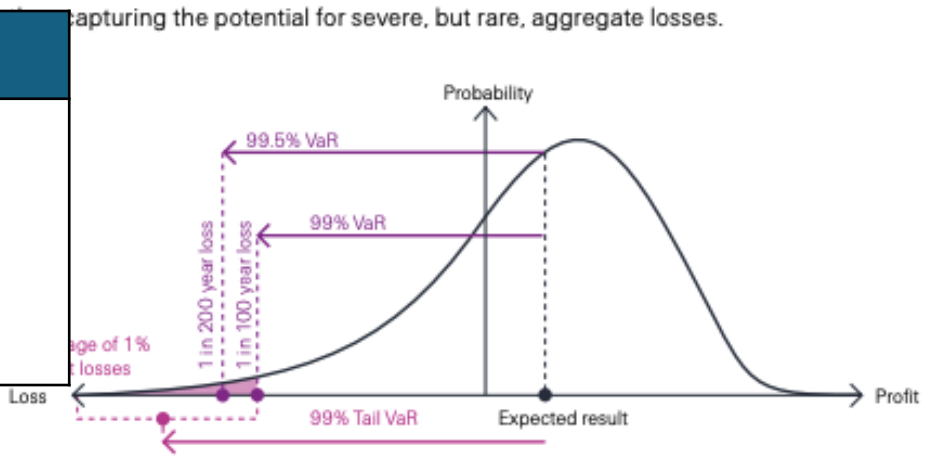
- Data & Metrics definition:
  - Define asset universe
  - Liability data
  - Rating agency / Regulatory models/rules
- Input into optimization:
  - Asset views
  - Liability views
  - Objectives / Constraints

Optimization

- Define Objective function mathematically
- Define Constraints mathematically
- Capture additional constraints:
- Capture different Time Horizons and views

Post - Optimization

- Iteration of output until it makes sense
- Cost of constraints analysis
- Downside tests
- Business as usual projections



Source: Swiss Re – EVM: measuring economic performance solvency
https://www.swissre.com/dam/jcr:5802e9ba-a7c6-48b3-bb6d-0765e033fcfa/2023-evm-measuring-economic-performance-solvency.pdf

3.2 Example: Optimization Summary

- Assume Management did Set business environment, Management Objectives & Constraints, Corporate Governance & Process and we kick off exercise.

1 BUSINESS ENVIRONMENT

RISK AND REGULATION
- Articulate risk appetite and identify risk measure
- Asset admissibility
- Use of derivatives
- Internal views and tactical objectives

CAPITAL/ACCOUNTING
- Regulatory capital – e.g. NAIC RBC, Solvency II, BSCR, etc
- Rating agency capital – e.g. S&P CAR
- US Stat/US GAAP/IFRS
- Earnings volatility management

ASSET/LIABILITY MODELLING
- Stochastic model of assets and liabilities
- Fully consistent with internal model view of risk

2 OBJECTIVE AND CONSTRAINTS

OBJECTIVE
- Maximize total return
- Minimize economic risk
- Manage earnings volatility

INSURANCE CONSTRAINTS
- Liquidity needs
- Risk & capital budget
- KRD or cash flow matching

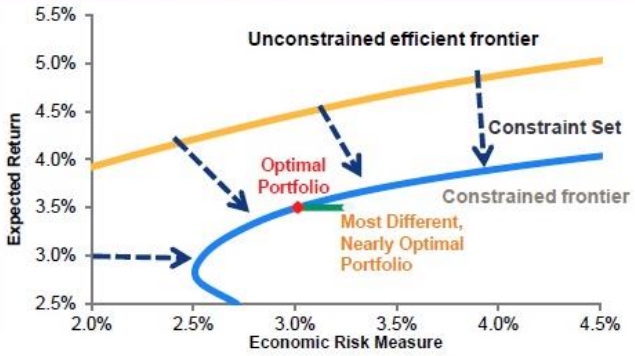
ASSET CONSTRAINTS
- Min / max allocations
- Risk parity constraints
- Currency risk

- Risk shaping by combining multiple views of risk, capital, and value generation
- E.g. maximize return vs. economic surplus volatility subject to a net income (accounting) floor

3 QUANTIFICATION OF OPTIMAL STRATEGIES

OPTIMIZATION
- Optimize Single risk objective is minimized over different return targets
- Results reflect the maximum Sharpe ratio portfolios within risk budget, capital budget and constraints

QUALITATIVE REVIEW
- Review suitability of selected portfolios from qualitative perspective
- Assess risk factors that are not captured or limited in the current framework
- Revisit stage 2 with revised assumptions



Source: J.P. Morgan Asset Management

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J.P.Morgan ASSET MANAGEMENT

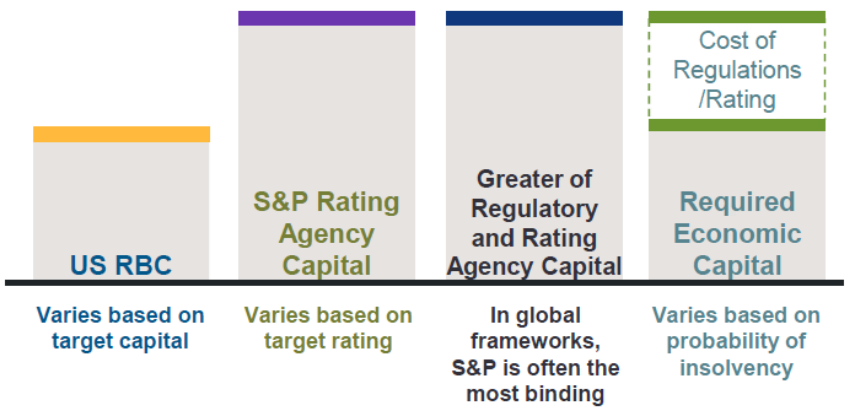
Source: JP Morgan Asset Management

3.2 Example: Impact of Constraints on E[R]

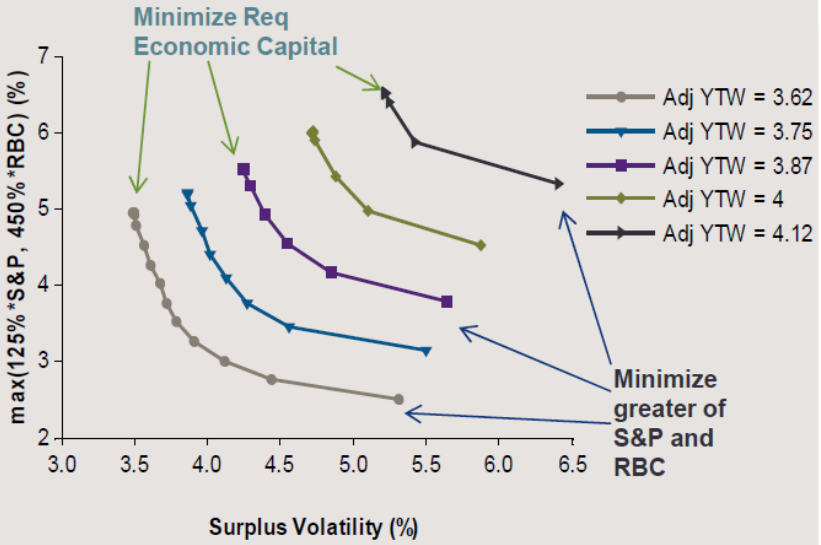
Regulatory & Rating Agency vs Economic Capital

Choose an asset allocation to minimize the greater of regulatory, rating agency, and economic capital

Risk limits and capital constraints impose an economic cost



Capital Requirement vs Surplus Volatility



- As constraints are added, they limit the efficiency of the optimal portfolio and as they are relaxed (moving up the y-axis), we can hit lower and lower surplus volatilities (albeit with diminishing returns) at each adjusted yield target
  - This is not to say constraints make solutions worse as they often take into account real, practical limits and factors that are not captured in the economic risk measure
- Portfolios at the right end, conversely, minimize the required capital amount mandate by the most limiting regulator/rating agency (greater of 450% RBC and 125% rating agency capital), but economically the portfolios are least efficient
- A balance must be set between these competing objectives to have practical asset allocations that satisfy regulators, rating agencies, and shareholders

Source: JP Morgan Asset Management

3.1 Implementation: Project Management

Pre Optimization

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- Capture different Time Horizons and views

Post - Optimization

- Iteration of output until it makes sense
- Cost of constraints analysis
- Downside tests
- Business as usual projections

Implementation

- CIO presentation to Investment Committee and Board
- Board approving asset allocation decisions and adjusting company targets correspondingly
- New targets communicated through company for execution

Source: Swiss Re – EVM: measuring economic performance solvency
https://www.swissre.com/dam/jcr:5802e9ba-a7c6-48b3-bb6d-0765e033fcfa/2023-evm-measuring-economic-performance-solvency.pdf

3.3 Execution – Issues !

Execution – ISSUES !

- Cant turnover entire portfolio at T_0
  - Turnover constraint driven by market conditions and asset classes
  - Alternatives take forever
- Which allocation change to prioritize?
- IPS ranges for changing market conditions?
- Time horizon discrepancy across goals – what to do?

Source: Swiss Re – EVM: measuring economic performance solvency
https://www.swissre.com/dam/jcr:5802e9ba-a7c6-48b3-bb6d-0765e033fcfa/2023-evm-measuring-economic-performance-solvency.pdf

Section 4: Execution Discussion

4.1 Forecasting the Future: Time Horizon & Views

4.2 Navigating Market Cycles

4.3 Allocation Execution – Step by Step

4.4 Management Influence on Strategy

4.5 Latest Industry Trends

4.1 Forecasting the Future: Time Horizon & Views

Situation

- Time horizons differ for various objectives.

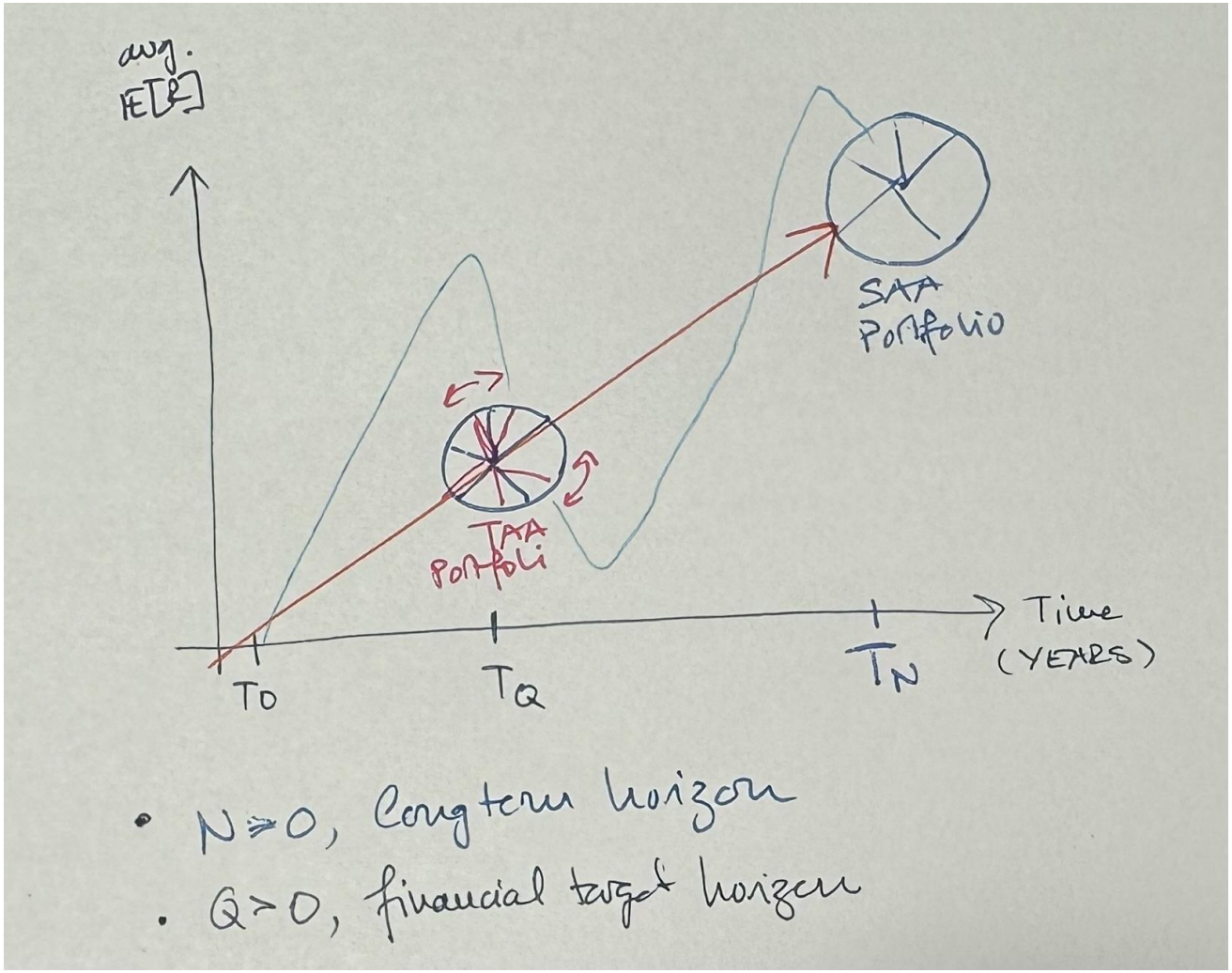
Complication

- Market conditions change at unknow frequency to unknow amount.

Resolution

- Optimize over multiple sets of views using different constraints.

4.1 Forecasting the Future: Time Horizon



4.1 Forecasting the Future: Time Horizon & Views

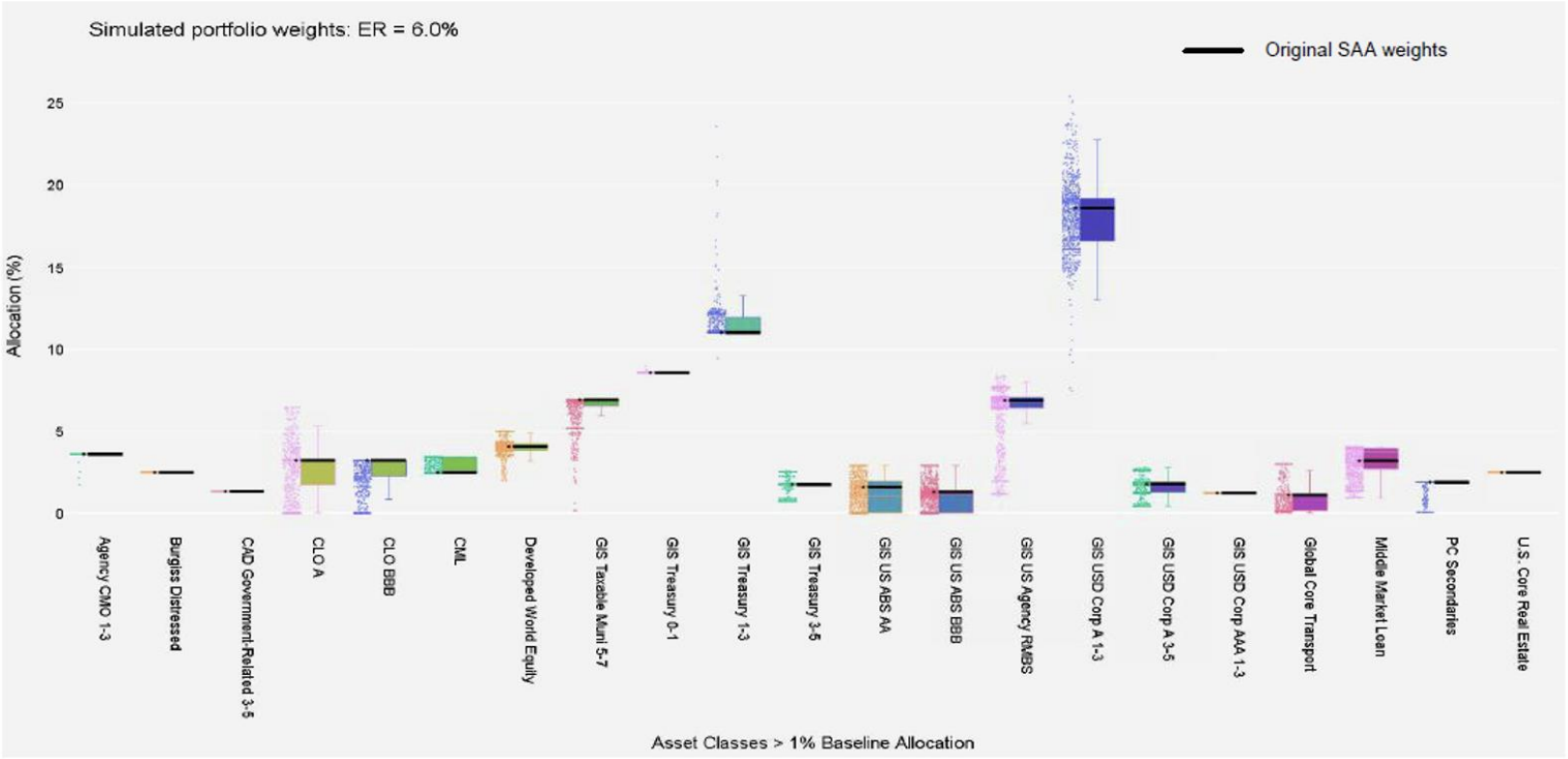
- How to model liquidity?
- How to model infrastructure?

Approach	Horizon	Advantage	Disadvantage
Economic Scenario Generator	1Y / Equil.	Holistic / large feature scope	Complex, requires skilled resources and investments. Scenario Generator models as well.
Factors - Macro / Risk Premium	Depends on factor universe	Holistic / narrative ties to economy	Hard to accurately capture across entire asset class universe (different frequency of underlying data reflect different risk premia)
Qualitative - Factor driven (LTCMA)	15Y / Equil.	Holistic / narrative ties to economy	Only works as average over long horizon and changes based in a non-systematic way.
Qualitative - Market view	4 - 18 months horizon	More data available to make more accurate forecasts about purchase conditions, ie. risk/return profile of allocation.	Only works for immediate time horizon and changes in a non-systematic way.

4.2 Navigating Market Cycles

Quantifying the impact on asset allocation of uncertain input assumptions

- For each asset class we show simulated portfolio weights (1000 trials) alongside a box and whisker chart showing the median, interquartile range and the whiskers represent the upper and lower quartile plus / less 1.5 times the interquartile range. The bold line shows the baseline asset allocation weight from the SAA base run

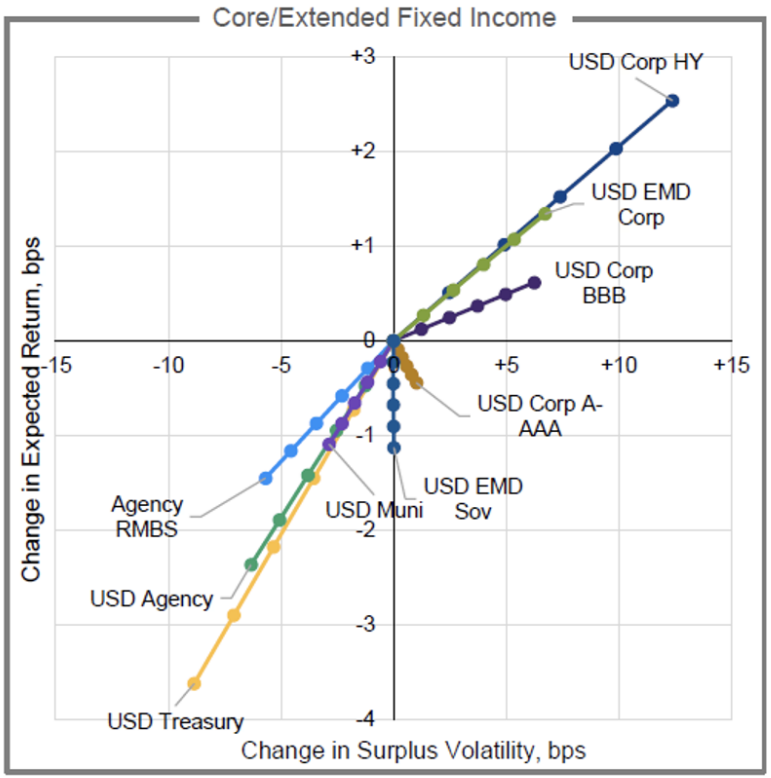


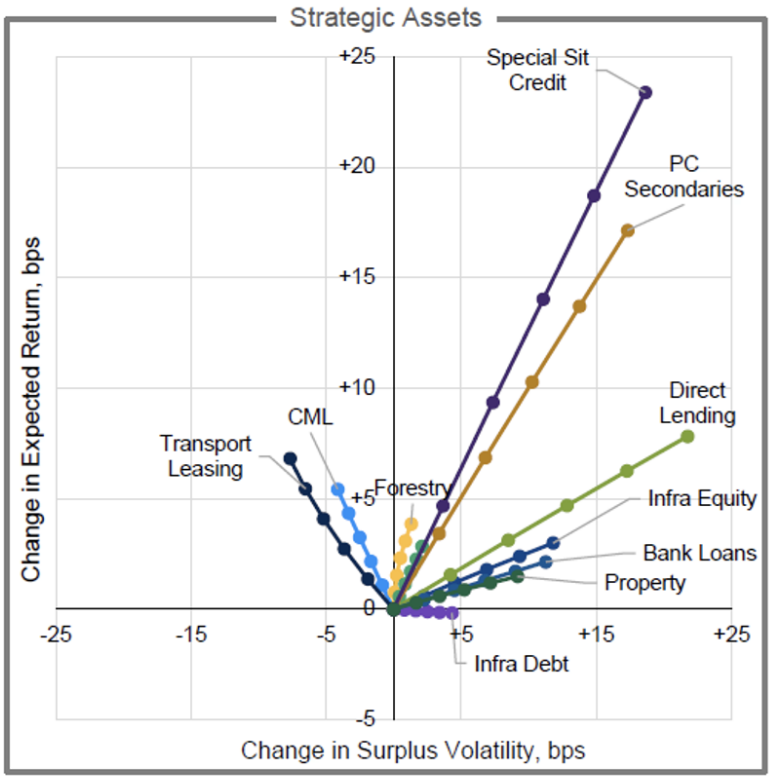
. Source: J.P. Morgan Asset Management interpretation and analysis

Source: JP Morgan Asset Management

4.3 A quantitative way to come up with allocation execution order – Elasticity Table

Impact of incrementally adding 1% towards each asset, funded pro-rata





Source: J.P. Morgan Asset Management analysis as at January 2023. Forecasts are not a reliable indicator of future performance.

Source: JP Morgan Asset Management

4.4 Management Influence on Strategy

Management Decision examples:

- Set business environment:
  - US or Europe?
  - Mutual / Public / Private
  - P&C or Life?
- Set objectives:
  - Earnings vs Return
  - Gain loss strategy?
- Set constraints from management perspective
- Set Corporate Governance
  - CIO reporting structure
  - ALM team on Asset or Liability side?
    - Report to CIO / CAO / CEO of LoB?
- Define accountability, roles and responsibility (implicitly)
- Kick of demand for exercise (implicitly)

4.5 Industry Trends

1. Regulatory environment shapes local industry participants
   - US/Europe/BDA/CI
2. Risk aversion curve differences can disrupt industries
   - PE-sponsored reinsurance transactions
   - Capitalize on expertise – Private Credit & Resi whole loan sourcing
   - New skillsets required – analyzing satellite data for Weather models
3. Adapting products to Insurance Balance Sheet Needs
   - ABF
   - Capital efficient structures.
4. Regulator response to trends (NAIC / BMA)

Section 5: Quantitative Solutions at Banks

5. Quantitative Solutions at Banks

A dedicated insurance platform within asset management

ASSET MANAGEMENT

- 3.1trn+ USD in assets under management across asset classes
- 782bn USD in long term fixed income assets managed globally
- Over 1,300 investment professionals providing 600+[1] different strategies globally
- 460mm+[1] USD annual research budget
- Global strategic objective: "To be the most respected asset management firm by delivering exceptional risk adjusted investment performance, by offering a broad and innovative range of products and by providing the highest quality service through local management of client relationships"

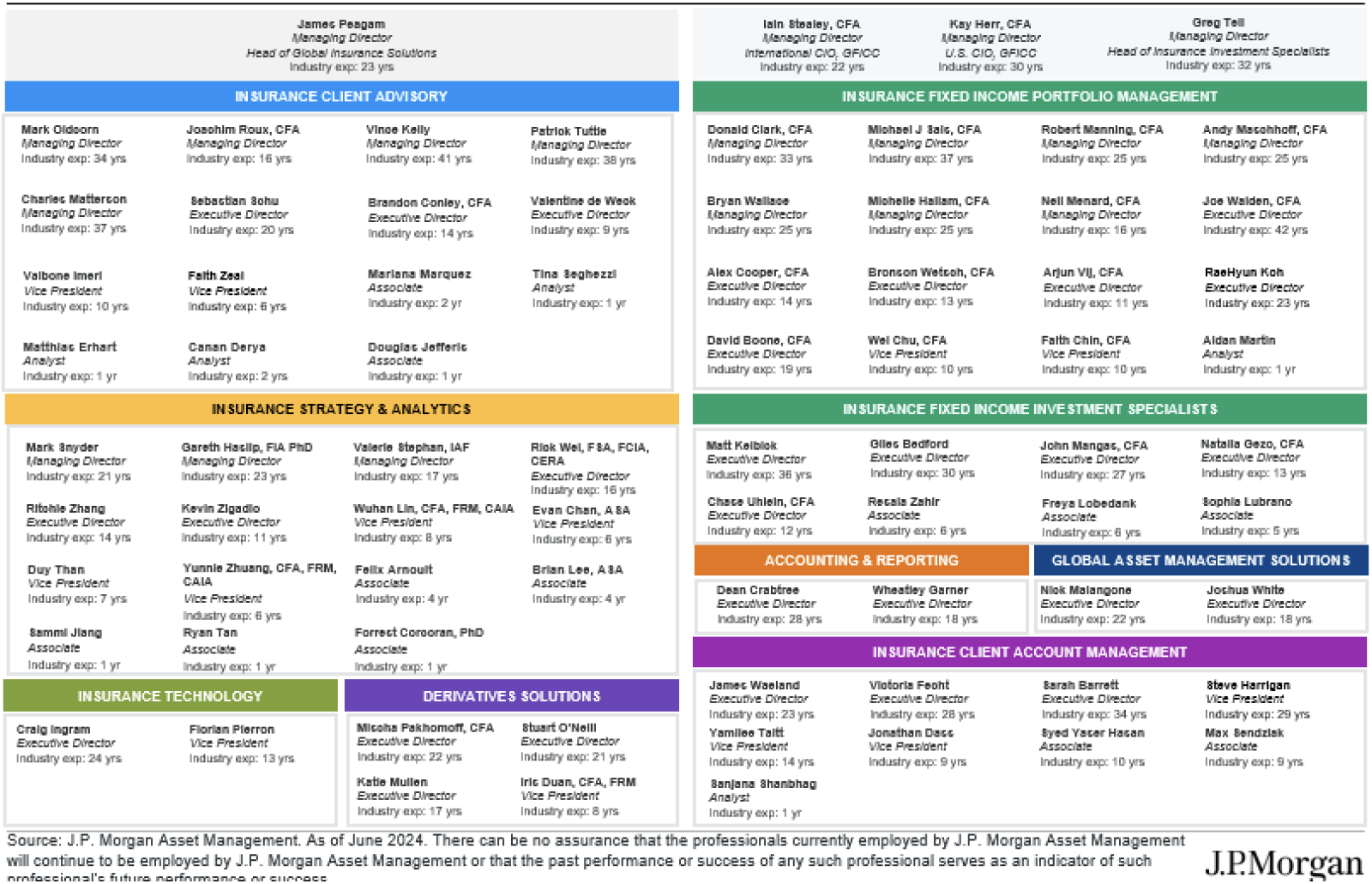
GLOBAL INSURANCE SOLUTIONS

- Over 40 years managing a broad range of insurance company assets
- Over 70 professionals dedicated to insurance
- Around 298bn[2] USD in insurance AUM
- In-depth understanding of ALM, asset allocation, regulatory, tax and accounting issues
- Global platform that spans all major asset classes
- Customized fixed income to address the specific investment needs of insurers
- Comprehensive accounting, risk and performance reporting
- GIS is a distinct business within asset management

Source: JPMorgan Chase & Co. as of June 30, 2024
[1]Data is updated annually, as of June 30, 2024
[2]Insurance AUM as of June 30, 2024

5. Quantitative Solutions at Banks

Working as an extension of your team



Source: J.P. Morgan Asset Management. As of June 2024. There can be no assurance that the professionals currently employed by J.P. Morgan Asset Management will continue to be employed by J.P. Morgan Asset Management or that the past performance or success of any such professional serves as an indicator of such professional's future performance or success.

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5. Quantitative Solutions at Banks

Portfolio Management

- Overall portfolio responsibility
- Ongoing, direct communication with the client
- Experienced multi-sector insurance portfolio managers

Investment Specialist

- Point-of-contact for the relationship
- Communicates market and strategy-specific information
- Partners with PM to support mandate

Client Account Management

- Main service contact for administrative, operational and legal items
- Manage complex solutions for the life cycle of the client
- Partner with your JPMAM coverage team to provide best-in-class client service

Accounting & Reporting

- Provides insurance accounting and regulatory expertise
- Attends industry conferences and produces insights and publications on important regulatory developments
- Investment reporting compliant with multiple basis of accounting

Strategy & Analytics

- Close coordination with portfolio management on analysis to support mandates including:
  - Strategic asset allocation
  - In-depth peer analyses
  - ALM analysis
  - Multi-entity capital optimization

Client Advisor

- Provides industry perspective, consultative and problem solving advice
- Manages overall JPMAM / insurance client relationship
- Delivers product knowledge and keeps clients abreast of new or compelling product offerings and industry developments

For illustrative purposes only.

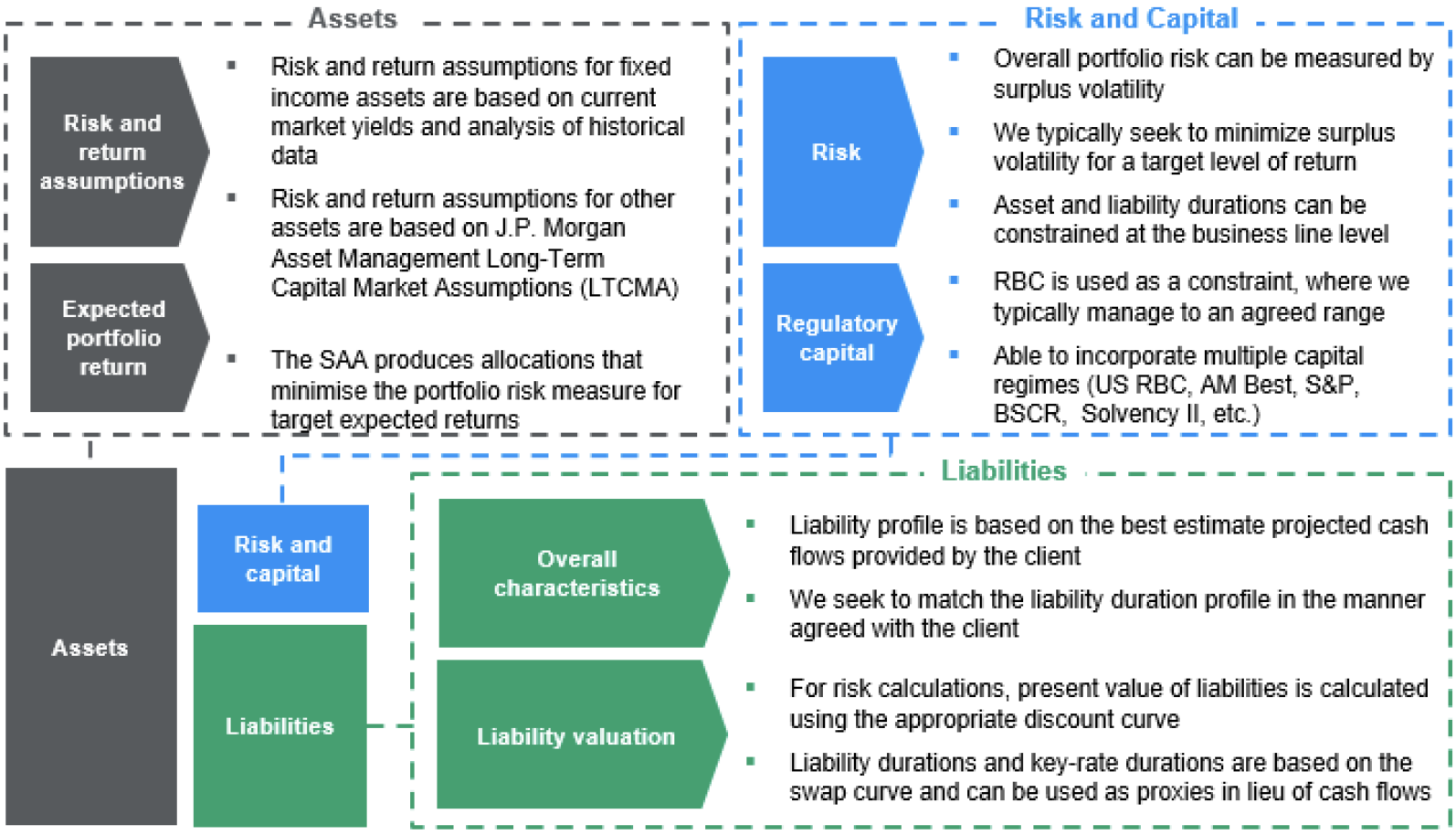
5. Quantitative Solutions at Banks

Multi-disciplined team located across the US, UK, Europe and Asia

Tax, Accounting, Regulations and Capital (TARC)	• Deep knowledge of relevant TARC considerations in all major insurance markets • Ability to model regulatory and rating agency capital and accounting volatility for varying asset allocations • Estimate impact of changes to TARC and provide guidance to insurers on how to respond to TARC changes • Advice on appropriate investment structure to achieve TARC goals
Asset Allocation and ALM	• Understanding of insurance liability variability and market sensitivity • Asset allocation analysis that accounts for all major factors that constrain insurers • Assumptions and methods for SAA, TAA as well as CUSIP level repositioning
Peer/Industry Analysis and M&A Support	• Industry leading analysis of US Statutory data leverages JPM data on public and private assets • Scalable analysis of GAAP/IFRS financials • Assess portfolios related to companies targeted for acquisition or reinsurance deals
Stress Testing and Risk Management	• Historical and forward looking stress testing and impact on insurance specific metrics • Integration of asset and liability risks • Stress test impact to economic, accounting and capital metrics
Thought Leadership	• Timely updates on industry trends and developments • Huge number of client meetings ensures we have relevant insights and industry color

5. Quantitative Solutions at Banks

Asset liability management framework



Source: J.P. Morgan Asset Management. For illustrative purposes only. SAA – Strategic Asset Allocation; The portfolio risk management process includes an effort to monitor and manage risk, but does not imply low risk. Surplus is defined as statutory surplus excluding Asset Valuation Reserve (AVR).

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- Early career website: https://www.jpmorganchase.com/careers/explore-opportunities/students-and-graduates
- Apply early !
- Network now already now !

Thank you !

References

- *Capital IQ – S&P Global* https://www.capitaliq.spglobal.com/
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