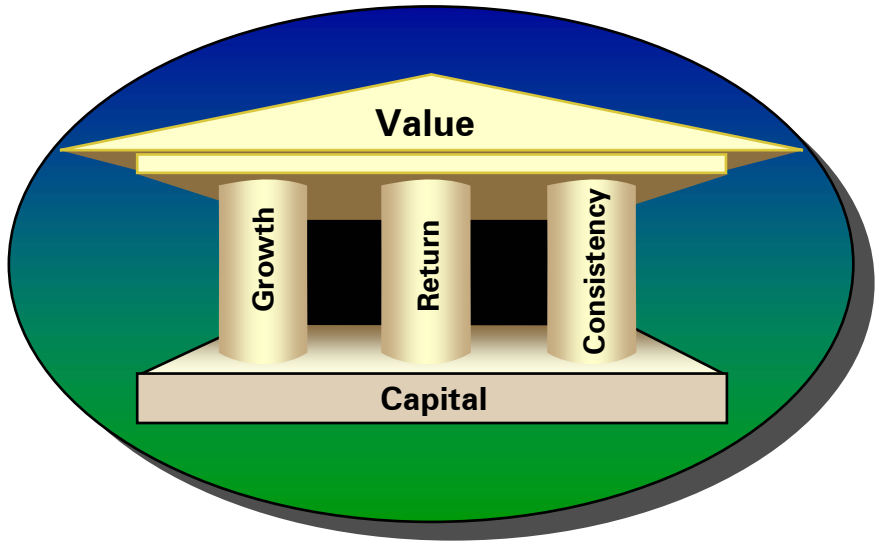
CS-14: Risk and Capital Management Through ALM

CAS/SOA Enterprise Risk Management Symposium

Washington, D.C.
July 29-30, 2003



The ALM framework has become increasingly attractive for P/C carriers

- Insurance carriers have two objectives: Increase returns and maintain a consistent flow of earnings
- Materiality of risk varies between underwriting risk and inflation risk
- Many carriers use a sub-optimal asset mix
- Lack of coordination between asset managers and liability managers
- Increased technological capabilities relating to correlation of risk categories and simulation/optimization techniques

A robust ALM framework should provide answers to key business issues and help to improve business performance

- What is the optimal investment strategy for a company given its liability and capital structure?
  - **How does it affect the capital position of the enterprise?**
- How can an efficient and ongoing coordination process between asset and liability departments be implemented?
- How does a company's ALM process compare to its competitors?
- How can management gain a deeper understanding of the implications of their strategic decisions on the performance of the business?
- How can a company get ALM results in an easy-to-understand format?

Framework of the Asset Liability Management Process

Phase I

Rigorous Diagnostics to Determine Candidate Portfolios

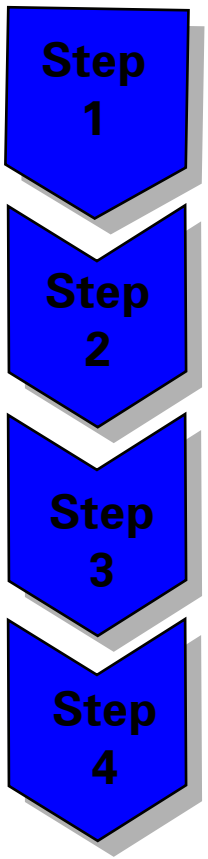
Phase II

Implementation through Investment Policy Development, Manager Selection, and Benchmarks

Phase III

Monitoring and Evaluation of Portfolio Performance and Attribution

Phase I is performed in Four Steps



Define Scope, Focus and Terms for the analysis

Model the Business through DFA

Identify Candidate Portfolios through the Efficient Frontier

Optimize Candidate Portfolios to Determine Minimum Needed Assets

Define the Scope, Focus and Terms

Determine financial objectives and collect information to derive model assumptions

- Agree on Economic Assumptions

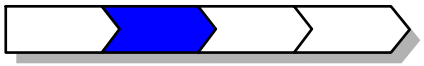
→ Economic Assumptions include - current and long-term levels for interest rates, equity returns and inflation

- Discuss Business Issues and Current Financial Condition

→ Financial Statement Information
Asset Classes
Balance sheet positions
Future business plans

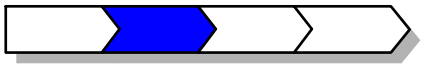
- Identify Performance Metrics

→ Measures of reward
Economic value
Return on capital
Rating objectives
Tolerance for risk
Variability of earnings
Surplus volatility
Solvency



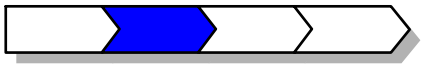
Model the Business

- The modeling process
  - gather data
  - build model (liabilities and economic scenarios for each asset class)
  - run DFA model to produce scenarios
- Business Plan
  - Time Horizon
  - Risk Profile of Liabilities
    - Premium levels and underwriting cycle
    - Duration of cash flows and sensitivity to inflation
    - Variability of amount and timing
    - Correlation between lines of business
  - Growth
    - Cash-flow provided from operations
    - Impact of change in mix of business on duration, inflation and variability
  - Tax position
    - Taxable/tax-exempt mix
    - Efficient use of NOL's



Model the Business

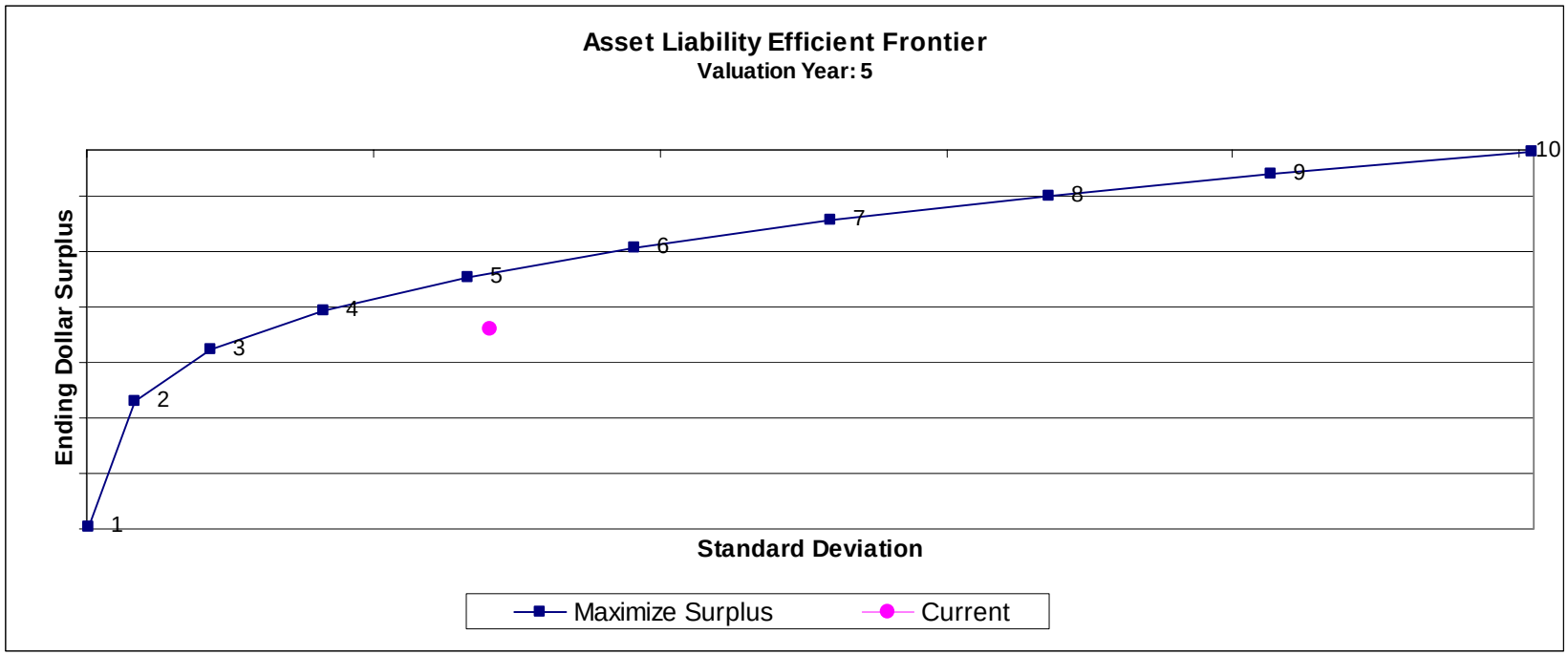
- Economic and Capital Market Conditions
  - GDP growth rates
  - Interest rates yield curves
  - Equity market risk premium
  - Inflation rates
  - Variability of asset classes
  - Correlation between asset classes, GDP and inflation
- Other Constraints
  - FAS 115
  - Regulatory constraints
    - Concentration
    - Individual securities
    - NAIC Risk Based Capital
  - Rating agency “limitations”
    - Equity allocation
    - Non-investment grade penalty
    - Current income versus unrealized gains
    - AM Best - BCAR



Model the Business

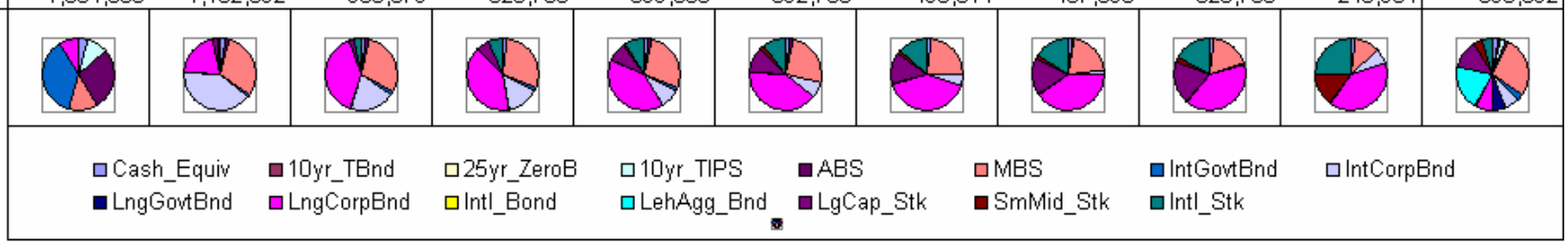
- Reward measures
  - The key reward measure should relate to both assets and liabilities
  - For P/C companies the reward measure usually relates to one of:
    - Solvency - surplus to assets
    - Earnings - earnings yield
    - Economic value - discounted value of free cash flows
- Risk measures
  - Standard deviation
    - Standard measure of spread or dispersion
  - Downside risk measure
    - Defines upside values as not risky
    - Defines risk relative to certain bounds

Identify Candidate Portfolios



Identify Candidate Portfolios

	Maximize Surplus										
	Efficient Portfolios										
Assets	1	2	3	4	5	6	7	8	9	10	Current
Cash_Equiv	5.0	3.4	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.5
10yr_TBnd	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25yr_ZeroB	0.0	0.0	0.0	0.3	0.2	0.2	0.3	0.3	0.5	0.4	0.3
10yr_TIPS	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3
ABS	27.6	1.5	1.5	0.2	1.3	1.2	0.1	1.0	0.0	0.0	1.4
MBS	12.6	30.0	29.5	28.7	27.5	25.4	23.3	20.2	18.0	10.8	27.3
IntGovtBnd	37.3	1.2	1.3	1.4	1.4	0.0	0.0	0.0	0.0	0.0	2.4
IntCorpBnd	0.0	39.8	20.2	14.7	8.6	6.9	5.0	2.1	0.1	6.8	7.1
LngGovtBnd	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6
LngCorpBnd	8.6	21.2	39.9	40.0	40.0	40.0	40.0	40.0	40.0	40.0	8.3
Intl_Bond	0.0	0.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.6
LehAgg_Bnd	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0
LgCap_Stk	0.0	1.7	2.6	6.4	9.2	11.9	13.6	16.1	19.4	0.0	13.0
SmMid_Stk	0.0	0.0	0.0	0.2	1.2	1.8	2.0	2.2	2.2	15.4	4.5
Intl_Stk	0.0	1.0	2.9	6.1	8.4	10.5	13.7	16.1	17.5	24.6	4.7
Risk	1,244,770.42	1,260,485.47	1,287,246.75	1,326,519.28	1,376,730.73	1,435,221.55	1,503,631.67	1,579,581.47	1,657,256.01	1,748,228.01	1,384,474.68
Reward	-1,604,580	-1,152,092	-965,079	-820,735	-699,886	-592,788	-496,314	-407,395	-323,706	-245,964	-890,592



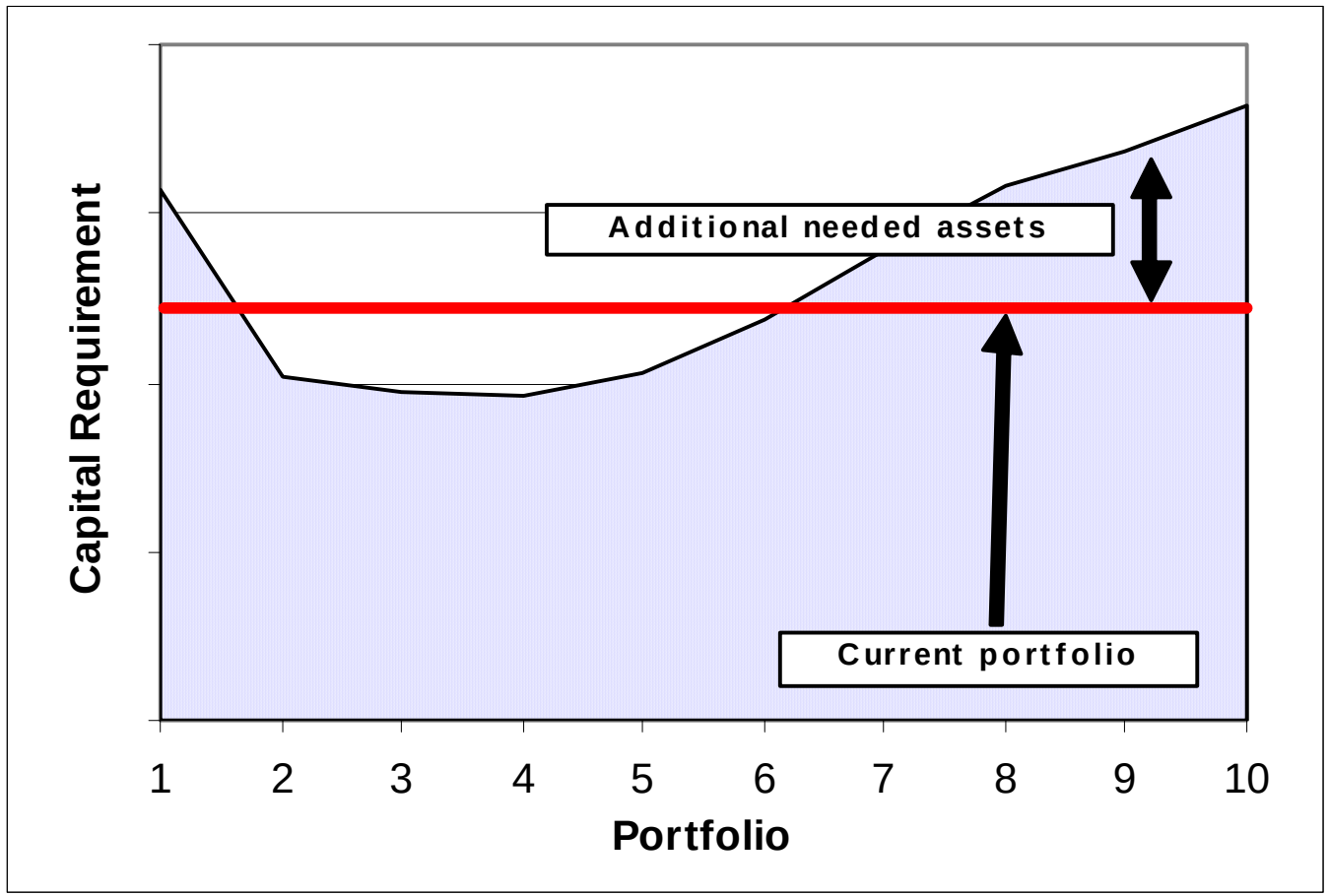
Optimize Candidate Portfolio

- Candidate portfolio analysis allows more detailed review of
  - probability statements
  - earnings and solvency issues
  - other issues (RBC, etc)
- Identify the minimum amount of assets needed to finance the business and the amount of unrestricted assets
- This phase of work reflects management's preferred position on the efficient frontier and the optimal amount of needed assets to finance the business

Varying the asset allocation affects the amount of capital required

- The asset mix affects the expected risk and return of the portfolio, and the risk of the business.
  - Capital requirements (needed assets) will therefore be impacted directly by the asset mix.
  - A relatively more diversified portfolio requires less capital than a relatively less diversified portfolio.
  - A short-term cash portfolio will have a lower expected return than a long-term equity portfolio. Therefore, the amount of assets needed to finance the present value of liabilities will be higher for a short-term cash portfolio than a long-term equity portfolio.
- There exists a minimum amount of assets required to finance the capital needed to support the risk of the business.
  - The amount of “unrestricted” assets is defined as the difference between current and needed assets.
  - Strategies regarding portfolio policy are developed around the asset allocation for needed assets and unrestricted assets.

Varying the asset allocation affects the amount of capital required



A robust ALM framework provides answers to key business issues and improves business performance by…

- Use of the Asset Liability Efficient Frontier (ALEF^{SM}) to identify candidate portfolio strategies
- Determining an optimal asset allocation to minimize the assets needed to finance the business
- Developing an investment strategy for assets in excess of needed assets
- Resulting in a deeper understanding of the implications arising from strategic decisions on the performance of the business