
# SPICE

## Structured Products to Improve Capital Efficiency

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# Discussion Outline

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- Improving Capital Efficiency
  - Derivative Protection Strategies
  - Structured Equity Investments
  - Alternative Assets
- Capital Efficiency from the Financing Side
- The Strategic Asset Allocation Process

# Risk Management Approaches

| | |
|---|---|
| **Avoid Risk** | • Insurance business is taking on risk<br>• Can avoid specific risks, e.g. investment |
| **Hold Capital** | • Limited resource that can be costly<br>• Extreme events can lead to large losses |
| **Transfer to PHs** | • Product design<br>• Product cycle perhaps reversing |
| **Transfer to Reins** | • Can be effective if price is acceptable<br>• Limited types of risks and limited capacity |
| **Transfer to Markets** | • Appetite depends on type of risk<br>• Potentially much larger capacity |
| **Manage Internally** | • Implement specific risk mitigation techniques<br>• The above are all examples of this |

# Interest Rate Risk: L&H

- Example: Net short 10 year bond profile
- Capital held against interest rate falls
- Cost of capital rate is constant
  - Hedging cost decreases as strike price moves further away from current levels
- Consider hedging where hedge cost is cheaper than cost of capital
  - Releases capital and provides tailored protection

# Interest Rate Protection: L&H

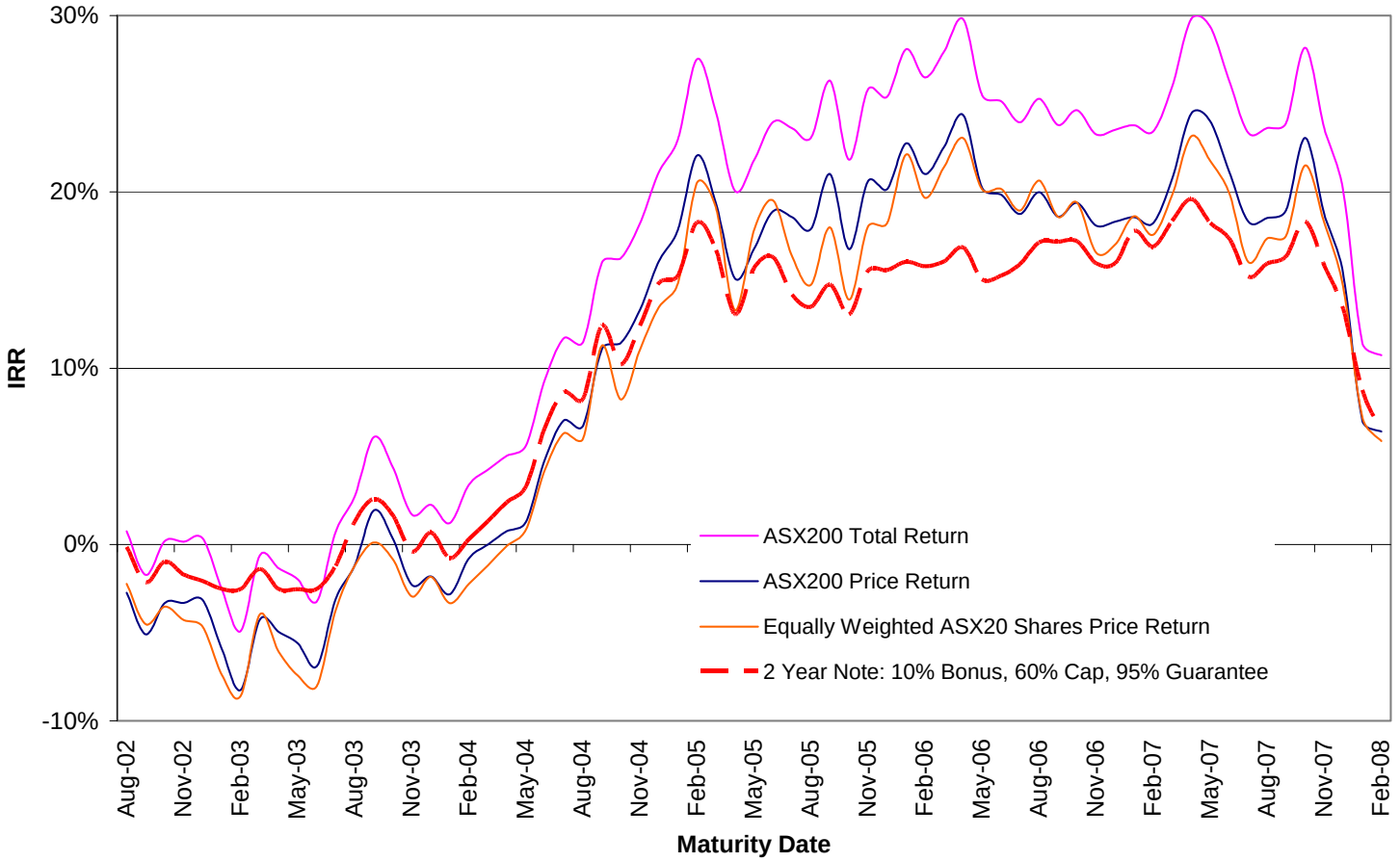
- Net short: $100m, 7.5 year duration
  - Capital for 1% to 2% fall in interest rates = $7.5m
- Quarterly ratcheting interest rate option
  - Strike is 1% out-of-the-money
  - Buy 2 year option and in 1 year sell 1 year option
  - If markets don't change, net cost is approx. $500k
- Benefits
  - Cost approx. equivalent to a 7% net cost of capital
  - In an interest rate shock your option value increases
  - You do not eat through your capital for falls > 1%

# Structured Equity: 2 Year Note

- 95% Capital Guarantee
- Basket of large cap shares
- High upside participation
- 2 year note with no coupons
  - Payout = Notional * [95% + max (0%, Basket Performance)]
- Basket Performance
  - All shares contribute actual price performance + Bonus, up to a maximum of the Cap
  - Performance calculated since inception

| ASX 20 Indicative Pricing | |
|---|---|
| Cap | Bonus |
| 60% | 10% |

# 2 Year Equity Note: Back-Testing




IRRs exclude substantial cost of capital savings compared to naked equity

Cost of 2 year 95% strike put option is approx 5% pa

Pay less in poor years, more in good years

- Calculations are approximate and ignore corporate actions
- Source: S&P for ASX 20 composition, Bloomberg for month end closing prices

# 2 Year Equity Note: Capital Implications

| General Insurance | |
|---|---|
| Debt Component | 1.64% |
| Derivative: Market Risk | 1.36% |
| Derivative: Basis Risk | 1.42% |
| Derivative: Counterparty Risk | 0.52% |
| **Total Capital Factor** | **4.94%** |
| **Unfunded TR Swap** | **2.94%** |

| Life Insurance | | |
|---|---|---|
| **Change in Market Value** | | Equity [1] |
| | | -25% |
| Yield Curve Shock [2] | +2.0% | -13.6% |
| | 0% | -11.3% |
| | -2.0% | -8.8% |

Equity & Rates Down

- Capital Factor = 8.8%

1. Assumes equity correlation of 1
2. Based on a parallel yield curve shift

# Structured Equity: 3 Year Notes

- 100% Capital Guarantee
- Lower upside participation
- Guaranteed coupons possible
- Equity-linked annual coupon
  - Globally Floored
  - Individually Capped
  - Performance since note issue

| 3 Year ASX 20 Indicative Pricing (pa) | |
|---|---|
| **Floor** | **Cap** |
| **0%** | **23%** |
| **3%** | **18%** |
| **5%** | **14%** |

$$MAX\left[Floor; \sum_{i=1}^{20} w_i \times MIN\left(Cap; \frac{Stock_{i,t} - Stock_{i,0}}{Stock_{i,0}}\right)\right]$$

# Structured Equity: 3 & 5 Year Notes

- Higher minimum coupon in early years
- Share price has more time to grow in later years

| Note Term | 3 yr | 5yr |
|---|---|---|
| **Cap** | **12%** | **15%** |
| Yr 1 Floor | 9% | 9% |
| Yr 2 Floor | 4% | 4% |
| Yr 3 Floor | 3% | 3% |
| Yr 4 Floor | | 3% |
| Yr 5 Floor | | 3% |
| **Min IRR** | **5.4%** | **4.5%** |

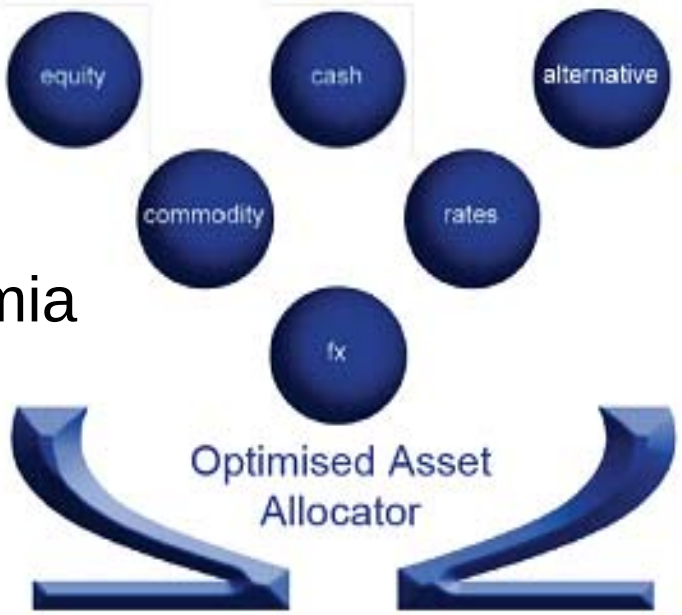
| Indicative Coupons (4% pa price increase) | | | Start 28/2/03 |
|---|---|---|---|
| **Note Term** | **3 yr** | **5yr** | **5yr** |
| Yr 1 Coupon | 9% | 9% | 10.5% |
| Yr 2 Coupon | 8% | 8% | 13.6% |
| Yr 3 Coupon | 12% | 12% | 13.7% |
| Yr 4 Coupon | | 15% | 14.5% |
| Yr 5 Coupon | | 15% | 13.2% |
| **IRR** | **9.6%** | **11.4%** | **12.9%** |

# Alternative Assets

| Benefits | Concerns |
|---|---|
| Higher Risk-Adjusted Returns | Low Liquidity |
| Low Volatility and Correlation | Lack of Transparency |
| Improved Portfolio Efficiency | Expensive |
| | Too Complex |

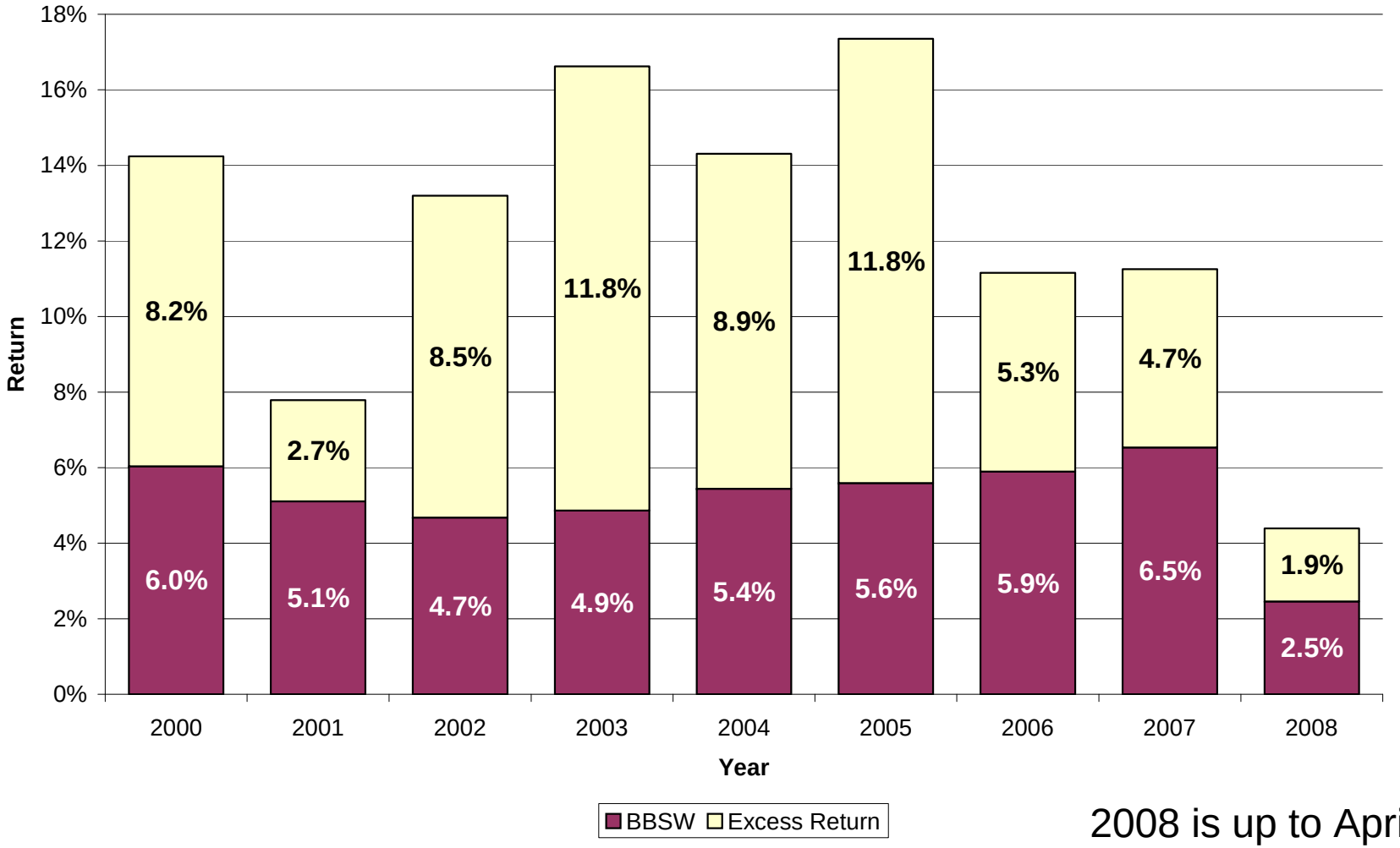
- Overcome the concerns by using beta access to alternative risk premia
- Question remains: Which risk premia?

# Basket of Alternatives




- Diversified Pool of Beta Risk Premia
- Daily Liquidity
- Transparency
- Optimised Asset Allocation
  - Regular rebalancing to target most efficient asset allocation in terms of return for a given risk level
- Risk Targeting (Volatility)
  - Regular rebalancing incorporates process to target specific volatility
- Controlling Extreme Events (VaR)
  - Stop loss events trigger immediate asset reallocation

# Historical Performance: AUD




2008 is up to April 28

# Capital Implications

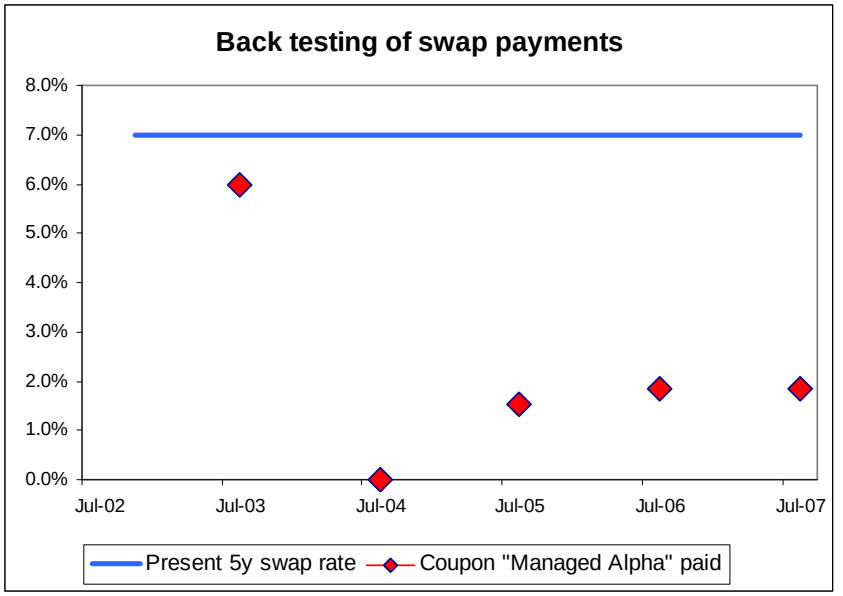
- General Insurers
  - Unfunded swap so limited counterparty risk
  - Potentially low capital factor due to derivatives
- Life & Health Insurers
  - Minimal/no impact of standard shocks
  - Low volatility and correlation
  - An appointed actuary could be comfortable with a low capital requirement
  - Protection is cheap due to low volatility and flat forwards

# Capital Efficiency: Financing Side

- Embed call option collar on absolute return strategy into debt or hybrid instrument
  - Include call option cost in interest rate
  - Interest Rate = Normal Rate + Call Option Cost – Call Option Payoff
  - Decrease expected interest cost and put a cap on maximum cost (less than cost of equity)
- Other structures can further protect down-side

# Hedge Fund Enhanced Debt

- 5 year note using 2 FoHFs (Oct 07 pricing)
  - Year 1 Interest = Normal Cost – 1%
  - Year 2+ = Normal Cost + 2.5% – FoHF Performance
- Break-even if FoHF return approx. 30% of historical average
- Cost saving is approx. 3.7% pa if FoHF return equals historical average



# Strategic Asset Allocation

- Typical SAA focuses on efficient frontier analysis
- Asset mix is often sub-optimal because not all risk premia are considered
- Especially for insurers, who invest within regulatory constraints
- Better to
  - Understand constraints
  - Consider how a wide range of risk premia can be combined
  - To achieve the maximum expected return
  - Within your regulatory constraints and risk appetite

# Investment Account Example

- Hedge some risks, e.g. inflation
- Take on risk premia within risk appetite
  - FI, equity, structured equity, alternatives
- Typical asset mix is not a long-term strategy
  - 70% bonds, 30% equity
- Driven by risk management and capital requirements
- Target higher expected return with capital efficiency
  - 20% bonds: yield approx 7.5% pa
  - 60% structured equity: 2 year 95% cap guar note: Bonus 10%, Cap 60%
  - 20% alternatives: 1 yr cap guar note, coupon = 2 * excess return
- Re-examine hedging, e.g. FI duration

# Summary

- Transferring risk to markets can add value
- Consider structured or alternative assets
  - Return profile that better meets your risk tolerances
  - Capital efficient structure
- Can implement on asset or financing side
- SAA should consider these possibilities
  - Appointed Actuary's duty to consider PH interests

# Questions

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