Overlay strategies: Managing risk and hedging inflation

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Areas of focus

– Introduction to overlay management
– Using risk overlays managing absolute risks efficiently
– Relative risk management against liabilities
– Effective inflation hedging via inflation swaps
Overlay management

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Overlay management solutions: An overview

Strategic asset allocation (SAA)

Tactical overlay
- Mandate-related
  - Fundamental
  - Technical
  - Quant
  - TAA overlay
  - Duration overlay
- Non-mandate-related
  - Portable alpha
- Strategic overlay
  - Relative risk (LDI)
    - Inflation-sensitivity
    - Duration-mismatch
    - Spread-sensitivity
    - Credit overlay
      - Inflation overlay
    - Interest rate overlay
    - Absolute risk
      - Market risks
      - Dynamic risk overlay
      - Carbon overlay
      - FX overlay

Risk management
Using risk overlays to manage absolute risks
Dynamic risk overlay: Approach

Objective: To secure specific NAV level (no guarantee), e.g., 95% of the NAV*

Advantages
- Participation in positive markets with limited downside risk
- Dynamic risk management
- The strategic allocation and management of underlying segments remain intact
- Provides continuous real time and market-related measurement of portfolio risk and existing risk budget

* No guarantee objective will be met. Investing in derivatives entails special risks relating to liquidity, leverage and credit that may reduce returns and/or increased volatility.
Centralized risk management on an overall portfolio level

Top-down approach leads to efficient risk budgeting

- Diversification effects within risk management are equivalent to reducing opportunity costs
- Centralized risk management, not on a single segment level

Optimizing existing risk capital

Diagram:
- **Overall risk**
- **Diversification**
- **Sum**
- **VaR segment 1**
- **VaR segment 2**
- **VaR segment N**
- **Segment 1 equities**
- **Segment 2 equities**
- **Segment N overlay**

Sum > overall risk
Rule-based process for effective risk management

- Define portfolio safety level via determining risk budget - difference between the current portfolio value and safety level
- Calculate portfolio risk using value at risk
- Continually monitor portfolio risk versus risk budget

Key for successful risk management:
Real time measurement of market risk combined with each client's risk budget
Ongoing, dynamic adjustment of portfolio risk

Portfolio risk is adjusted immediately when the risk budget is breached

Key considerations for managing a risk budget:

- High confidence level for VaR calculation (e.g. 99.9%)
- Market-related data for risk calculation (e.g. implied volatility)

Rule for dynamic risk management: VaR < risk budget
Effective risk measure: Implied value at risk (VaR)

DeRisk uses a 5-day horizon with a confidence level of 99.9% as well as implied market data for the calculation of the VaR.

Example: MSCI EMU, 09/16/2008

- Traditionally measured VaR (5 days, 99.9%) = -8.3%
- DeRisk VaR (5 days, 99.9%) = -13.2%

DB Advisors measures the portfolio risk continuously on a real time basis.

Source: DB Advisors, June 2011, For illustrative purposes only.

* The MSCI EMU (European Economic and Monetary Union) Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of countries within EMU. The MSCI EMU Index consists of the following 11 developed market country indices: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, and Spain.
Relative risk management against liabilities
Effective risk management adding the liability dimension

<table>
<thead>
<tr>
<th>Surplus = assets - liabilities</th>
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</thead>
<tbody>
<tr>
<td>Risk management</td>
</tr>
<tr>
<td>for absolute return investors</td>
</tr>
<tr>
<td>Expected return</td>
</tr>
<tr>
<td>Volatility</td>
</tr>
<tr>
<td>VaR</td>
</tr>
<tr>
<td>Risk management</td>
</tr>
<tr>
<td>addressing surplus risk</td>
</tr>
<tr>
<td>Expected surplus return</td>
</tr>
<tr>
<td>Surplus volatility</td>
</tr>
<tr>
<td>Surplus VaR</td>
</tr>
</tbody>
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*Source: DB Advisors, June 2011, For illustrative purposes only.*
Managing absolute versus relative risk

Including liabilities into the risk management process

**VaR < Risk budget**

**Surplus VaR < Risk budget**

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*Source: DB Advisors, June 2011, For illustrative purposes only.*
Duration: Key risk factor for pension fund investors

Swaps help fine-tune matching the liabilities duration

Surplus risk due to the shape of the yield curve and missing duration exposure

Adding swaps immunizes curve risk and adds duration

Source: DB Advisors, June 2011, For illustrative purposes only.
Effective inflation hedging via inflation swaps
An absolute as well as a relative risk for investors

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Tug of war between deflation versus inflation

**Deflationary forces**
- Real estate prices
- Double dip risk
- Lending
- Unemployment

**Inflationary forces**
- Massive liquidity injection by central banks
- Fiscal stimulus packages
- Interest rate cuts
- Commodity prices

Short-term: Inflation pressure remains very muted
Long-term: Inflation could be a significant investment risk
Traditional inflation hedges

- Can traditional asset classes hedge against inflation?
- Our analysis suggests that:
  - Inflation has a very low correlation to traditional asset class returns
  - Statistically, even a short position in treasuries is a better inflation hedge than commodities or equities

<table>
<thead>
<tr>
<th></th>
<th>Correlation to inflation</th>
<th>Significance</th>
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</thead>
<tbody>
<tr>
<td>Equities</td>
<td>-0.05%</td>
<td></td>
</tr>
<tr>
<td>Bonds</td>
<td>-14.82%</td>
<td>++</td>
</tr>
<tr>
<td>Commodities</td>
<td>12.11%</td>
<td>+</td>
</tr>
</tbody>
</table>

Hedging inflation with highly volatile asset classes may not be the solution and make portfolios vulnerable in a deflationary scenario.

Source: Investment and Pension Solutions, Thomson Financial Datastream, June 2011. +, ++ denote significance level of 10%, 5%
Inflation-linked securities: An adequate hedge?

Plus points:
– TIPS (inflation-linked bonds) may offer inflation protection
– Using TIPS reduces shortfall volatility for pension funds

Limitations:
– With TIPS, risks of real yield increases remain in the short term
– No hedge against deflationary outcomes
– Country specific credit and FX risks still embedded in TIPS

Efficiency of TIPS: Inflation protection only for long-term, buy-and-hold investors
Inflation-linked swaps (ILS)

Hedging

– Potential protection against inflation risk

Zero-coupon break-even swap

– Liquid market for European and US ILS and other inflation-linked products exists

– Counterparty risks easily can be eliminated using collateral management

Most efficient way to hedge against inflation
Restructuring an I/L mandate into a Inflation swap overlay
A practical example

Starting point: EUR 160 million invested into an inflation-linked bond (I/L) segment

Restructuring:
- Sell EUR 160 I/L bonds and transfer EUR 10 million in cash from the I/L segment in the new inflation overlay segment
- Distribute the remaining EUR 150 million of the I/L segment into other profitable asset classes (such as corporate bonds, emerging market bonds, etc.)

Significant increase in the expected return of the portfolio by keeping the inflation sensitivity

Status quo: I/L bonds investment EUR 160 mn

Source: DB Advisors, June 2011, For illustrative purposes only.
Summary: Implication for overlay investors

- Commodities, equities, and real estate are not an efficient inflation hedge
- Inflation-linked bonds offer inflation protection, but risks of real yield increases as well as credit risks remain
- Inflation overlay structures can be the most efficient way to protect against inflationary outcomes
- However, investors should seek additional diversification and return opportunities by investing in a broad range of asset classes
“If inflation continues to soar, you're going to have to work like a dog just to live like one.”

George Gobel (1919 - 1991)
Appendix

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Reducing funding status volatility in inflationary and deflationary scenarios

- Using interest rate and inflation swaps, pension funds can improve risk management for inflationary and deflationary outcomes
- Reducing the duration gap between assets and liabilities limits risk even in deflationary outcomes

Swaps are liquid and efficient instruments to hedge against inflation as well as deflation risks

Source: DB Advisors, June 2011. For illustrative purposes only.
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