Research

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Quality-Tilted Corporate Bond Indices

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Alternative Weight Indices

- Investors who have looked at Fiscal Strength Weighted sovereign indices and/or use alternative weight equity indices have asked about extending alternative weights into corporate bond indices

- Thematically, alternative weight indices address unexpected/undesired misalignment between investors' preferences/risk tolerances and their benchmark indices, e.g.,:
  - Issuer Capped indices
  - Fiscal Strength Weighted indices

- Some of the existing alternative weight corporate bond index offerings are based on overly simplistic assumptions:
  - Claim persistent market mispricing can be corrected using a simple set of fundamental metrics

Fundamental Themes for Credit

- What broad fundamental investment themes do corporate bond investors think about in their portfolio management process?
  - Quality & value

- What do they mean for credit investors?
  - Quality: measures the ability to service debt
  - Value: measures the long-term fundamental value of a company

- Quality is an increasingly important theme after the recent credit crisis
  - Increased focus on risk management
  - Heightened risk aversion

Exploring Quality

- How can we quantify quality in an objective way?
  - Rating, spread, default probability, liquidity…
  - Recognize the value in both fundamental and market-driven measures

- What characteristics are we looking for in a quality-tilted index?
  - Improvement in risk profile
    - Focus on tail risk, drawdown, not simply deleveraging
  - Robust: against unexpected market events

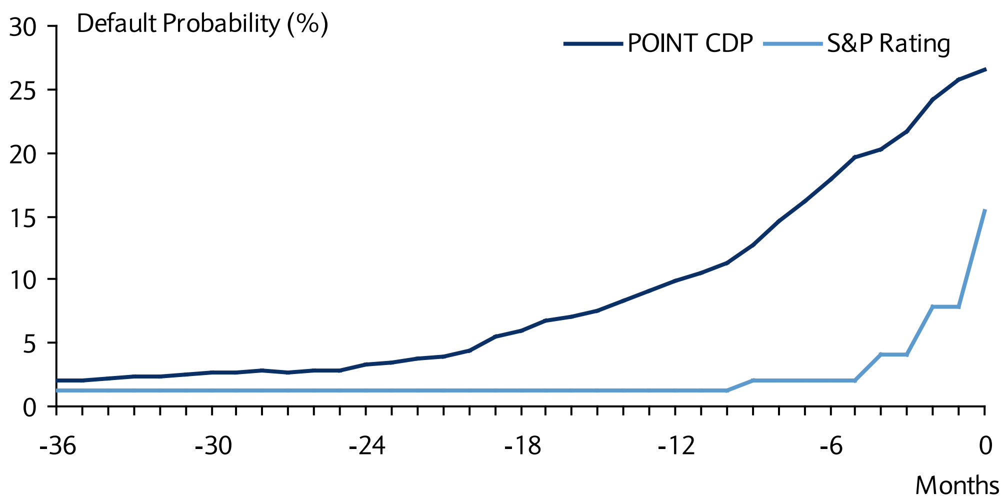
- How can use a quality measure for a prudent index design?
  - Start from a market-weighted benchmark and tilt towards high quality

- Universe: US Corporate Investment Grade (country=US)
  - Focus on excess returns

Rating vs. Spread as a Measure of Quality

- Rating: a straightforward measure of quality for credit investors
  - Does not respond to changing credit characteristics in a timely fashion

CDP vs. Rating Implied Default Probabilities



Source: Barclays Research

- Can we use spread as a measure of quality?

- How can we compare the two in a tilted benchmark context?
  - Construct 5 buckets every month by ranking the issuers

$$w_i^{quality} = w_i^{market} * \lambda_i$$

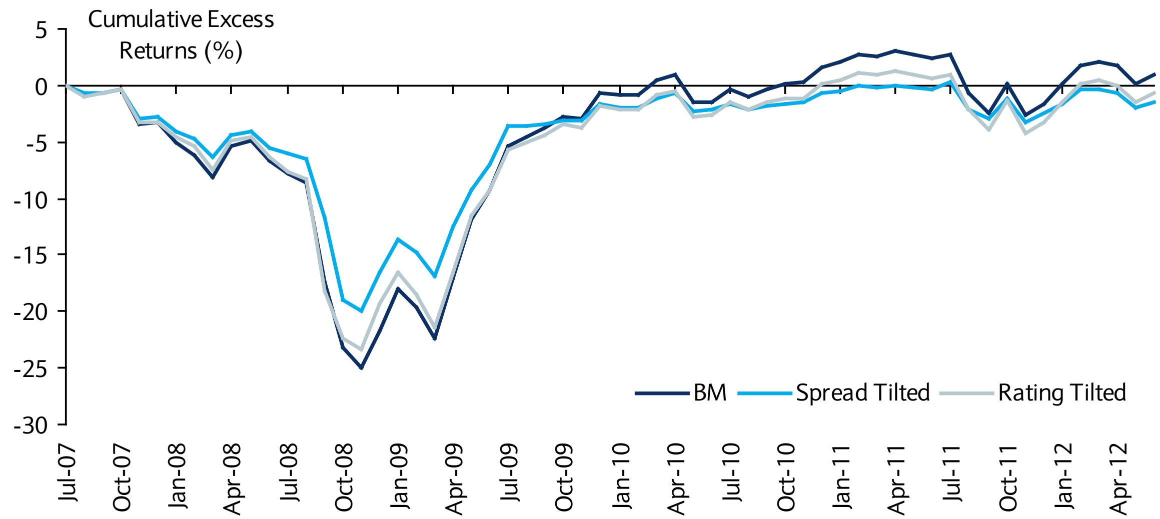
Rating vs. Spread in a Tilted Benchmark

	BM	Rating tilted	Spread tilted
Return	0.2	(0.1)	(0.3)
Volatility	8.1	7.9	6.4
VaR (5%)	(3.0)	(2.9)	(2.3)
Drawdown	(25.0)	(23.4)	(20.0)

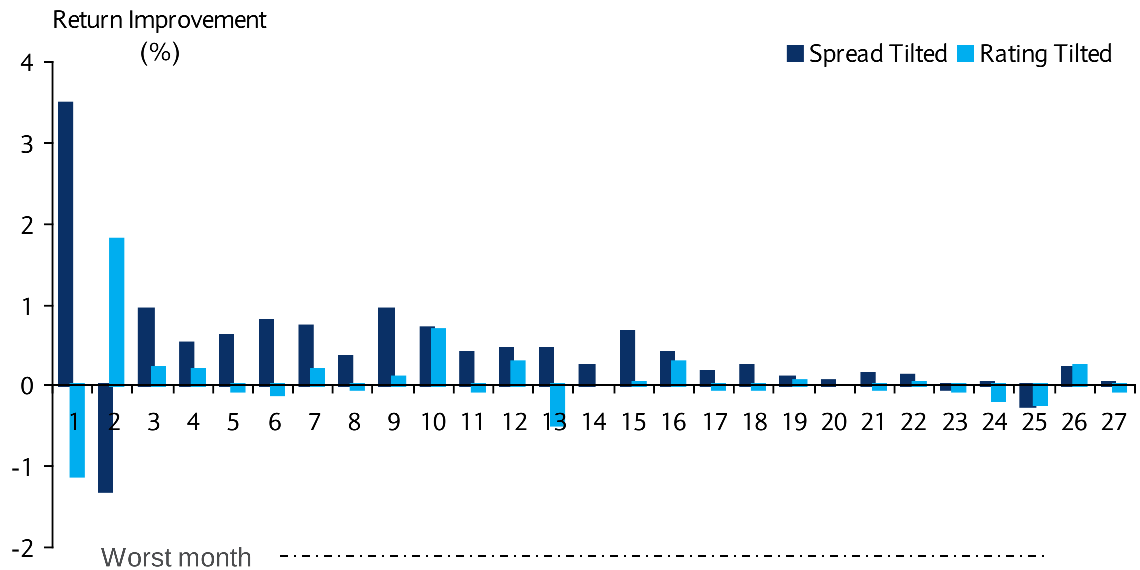
- Tilting by rating does not provide a significant improvement

- Spread tilting provides a more consistent downside protection

Performance of Rating Tilted vs. Spread Tilted Indices



Downside Protection due to Tilting



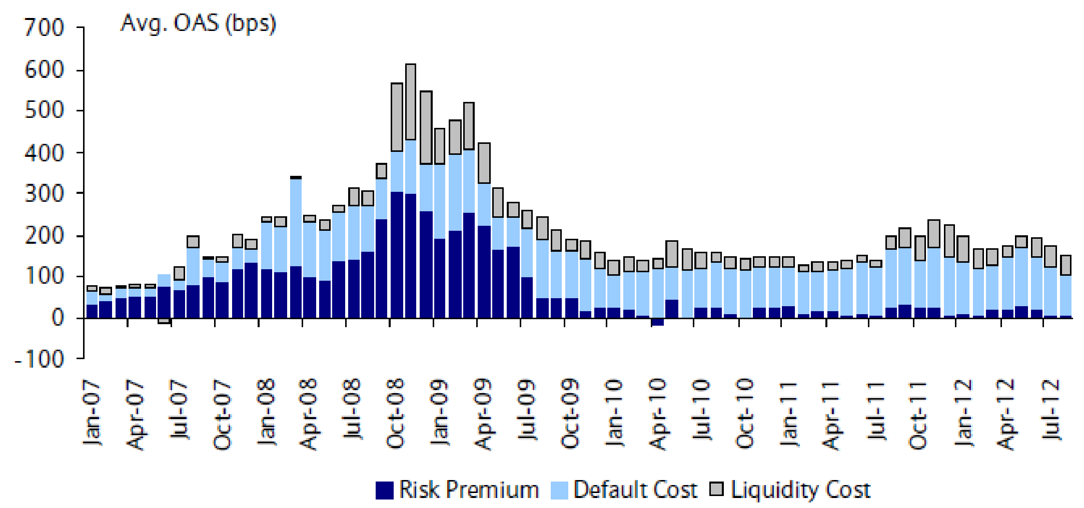
Source: Barclays Research

Understanding Spread

- We can decompose the spread into three components*:
  - Market-wide risk premium
  - Expected loss from default (Barclays Corporate Default Probability – CDP)
  - Expected liquidity cost (Barclays Liquidity Cost Scores – LCS™)

$$OAS_i = \alpha + \beta * ExpDefaultCost_i + \gamma * ExpLiquidityCost_i + \eta_i$$

Spread Decomposition for Barclays US Credit IG Index



Source: Barclays Research (LCS™ Report – Aug 2012)

*S. Dastidar and B. Phelps (2010), Decomposing Bond-Level Credit OAS into Default and Liquidity Components, Barclays Research

CDP as a Fundamental Valuation Metric

- Is the market correctly pricing in the default probability of corporates?
  - Noise-in-prices theory suggests departure from fair value
  - A corporate bond can be under/over-valued relative to its default probability

- We can use Barclays CDP to estimate a fundamental value for the bond

$$\underbrace{OAS_i}_{\text{Market Spread}} = \underbrace{\alpha + \beta * ExpDefaultCost_i}_{\text{Fundamental Spread}} + \underbrace{\eta_i}_{\text{Residual}}$$

- CDP is both
  - Market-driven: a desired characteristic to capture changes timely
  - Utilizes a set of fundamental variables, a long-term focus
    - Spread can be over-reactive to information, resulting in excess turnover

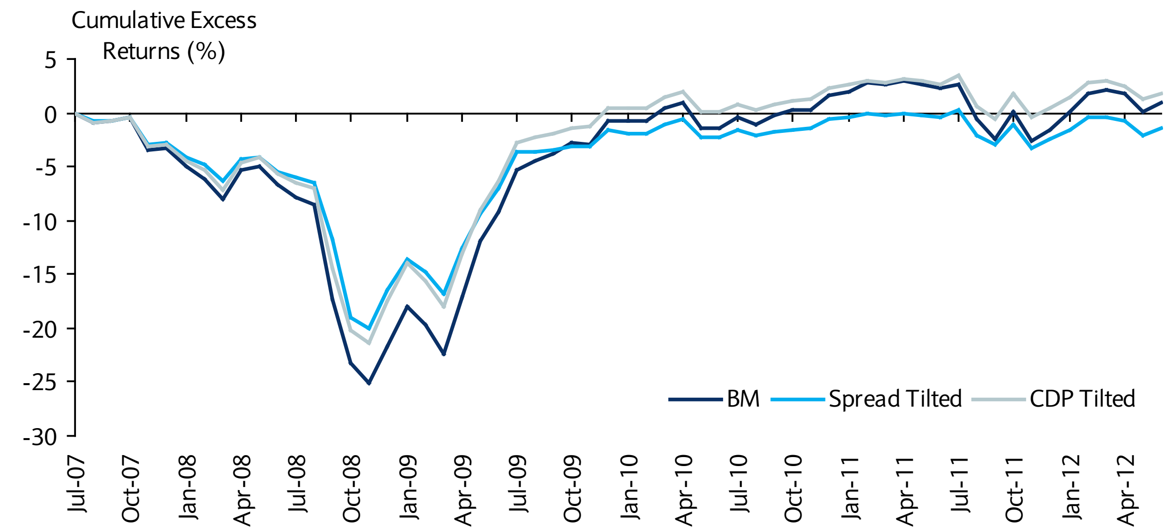
- Directly focuses on the ability to service debt

CDP vs. Spread in a Tilted Benchmark

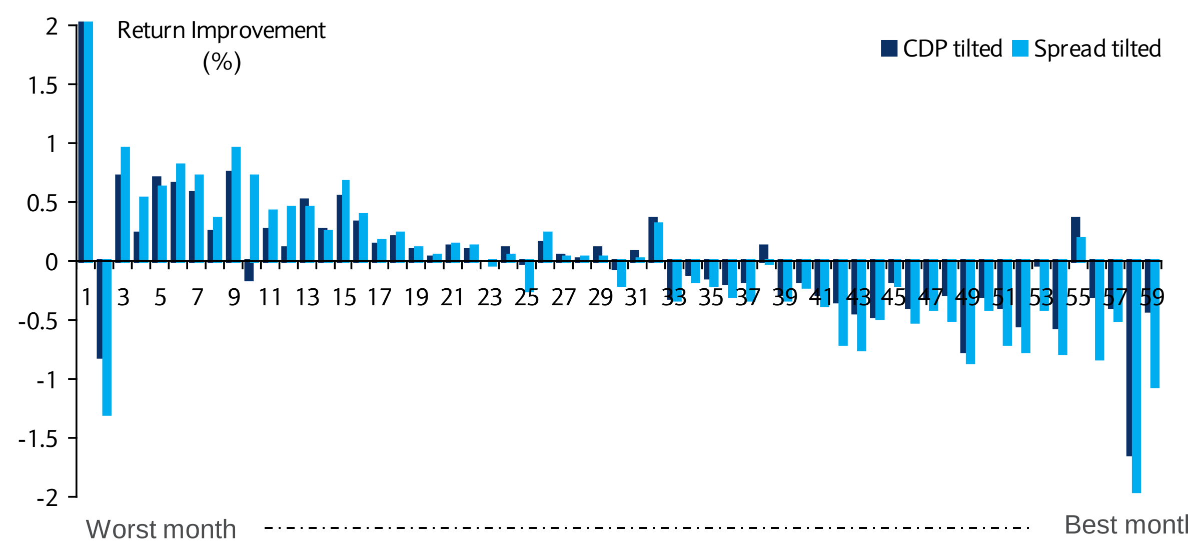
	BM	CDP tilted	Spread tilted
Return	0.19	0.45	(0.30)
Volatility	8.10	6.71	6.41
VaR (5%)	(3.03)	(2.58)	(2.34)
Drawdown	(25.03)	(20.86)	(20.03)

- Similar overall performance
- Spread generates larger TE in general, leads to underperformance

Performance of CDP Tilted vs. Spread Tilted Indices



Return Improvement due to Tilting



Source: Barclays Research

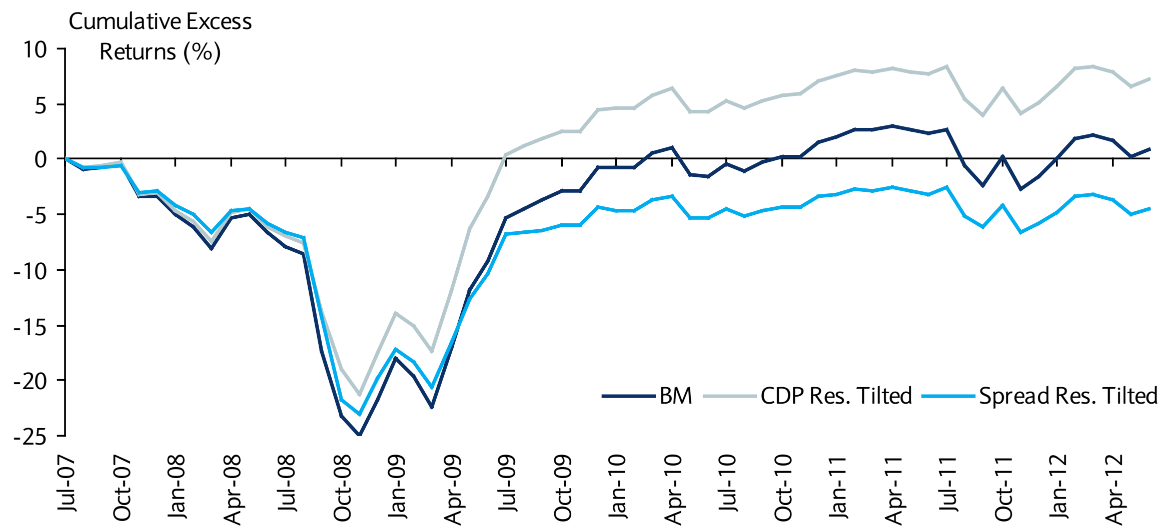
CDP Tilting - Controlling for Spread

$$\ln(CDP)_i = \alpha^{CDP} + \beta^{CDP} * \ln(OAS)_i + \eta_i^{CDP}$$

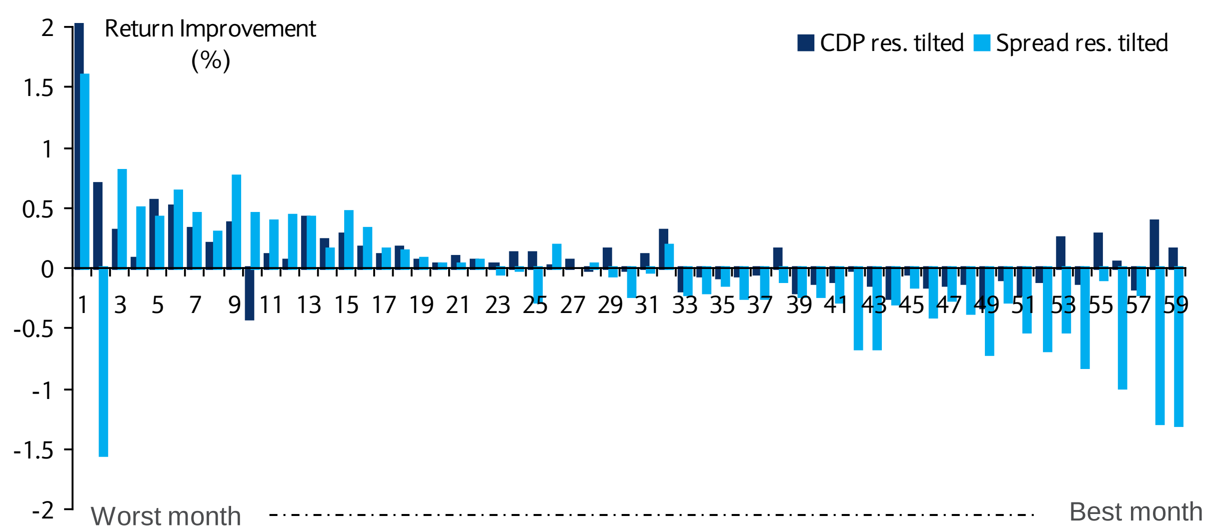
	BM	CDP tilted	CDP res tilted	Spread res tilted
Return	0.19	0.45	1.48	(0.91)
Volatility	8.10	6.71	7.34	6.97
VaR (5%)	(3.03)	(2.58)	(2.93)	(2.47)
Drawdown	(25.03)	(20.86)	(21.20)	(23.12)

- Use the residual for tilting
- Significant improvement in returns after controlling for spread

Performance of CDP Res. Tilted vs. Spread Res. Tilted Indices



Return Improvement due to Tilting



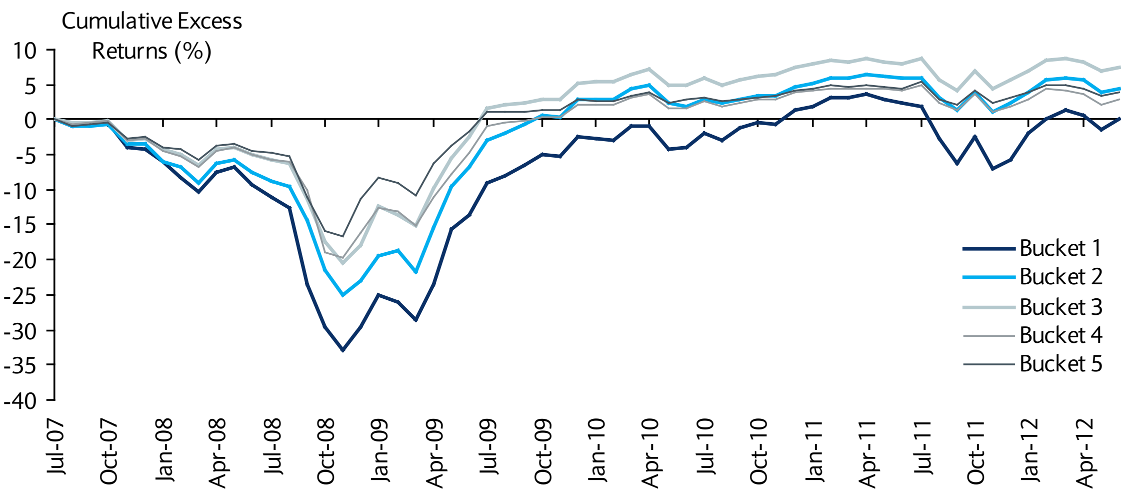
Source: Barclays Research

Characteristics of CDP Buckets

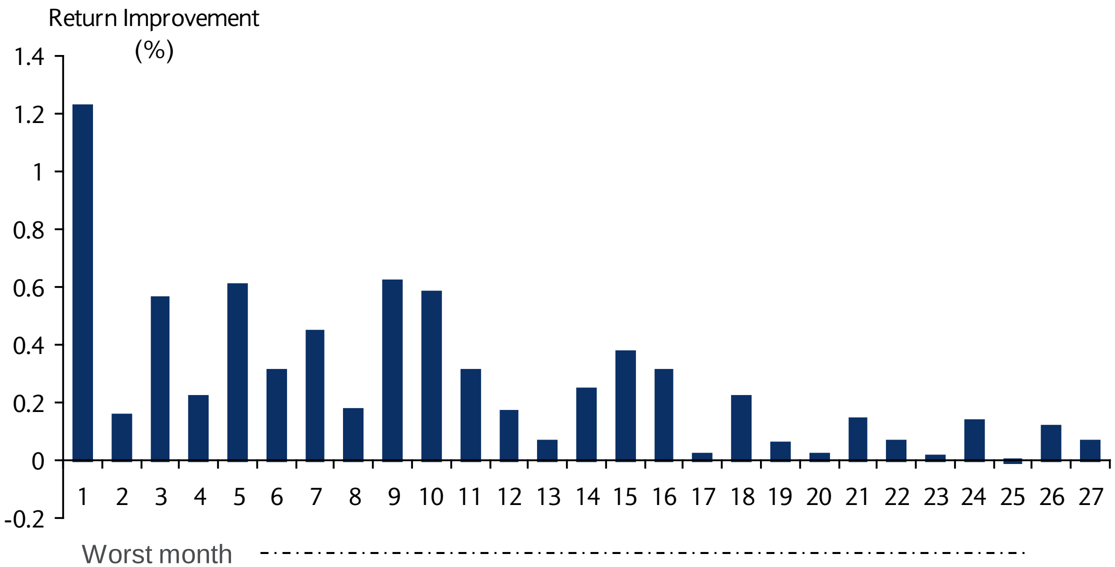
	Return	Volatility	VaR (5%)	Drawdown
B1	0.02	10.18	(4.49)	(32.87)
B2	0.91	7.91	(3.07)	(24.97)
B3	1.53	7.27	(3.00)	(20.39)
B4	0.60	6.97	(2.65)	(19.78)
B5	0.79	6.09	(2.29)	(16.69)

- Monotonic ranking across the buckets in terms of risk characteristics
- Consistent improvement for the worst market episodes

Performance of CDP Buckets



Downside Protection due to Tilting



Source: Barclays Research

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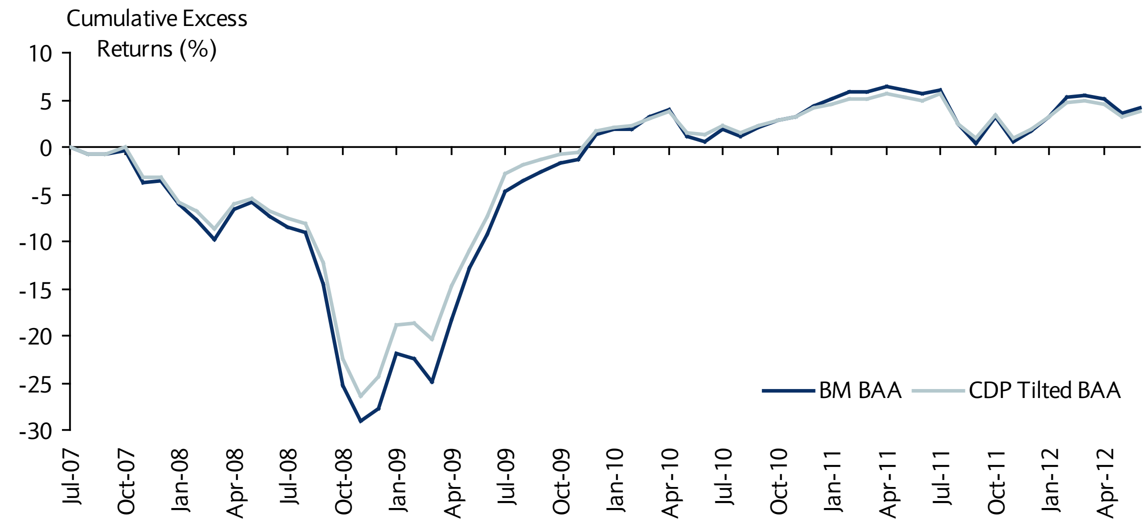
CDP Tilting - Controlling for Rating (BAA)

	BM BAA	CDP Tilted BAA
Return	0.83	0.75
Volatility	9.32	8.34
VaR (5%)	(3.71)	(3.31)
Drawdown	(29.01)	(26.46)

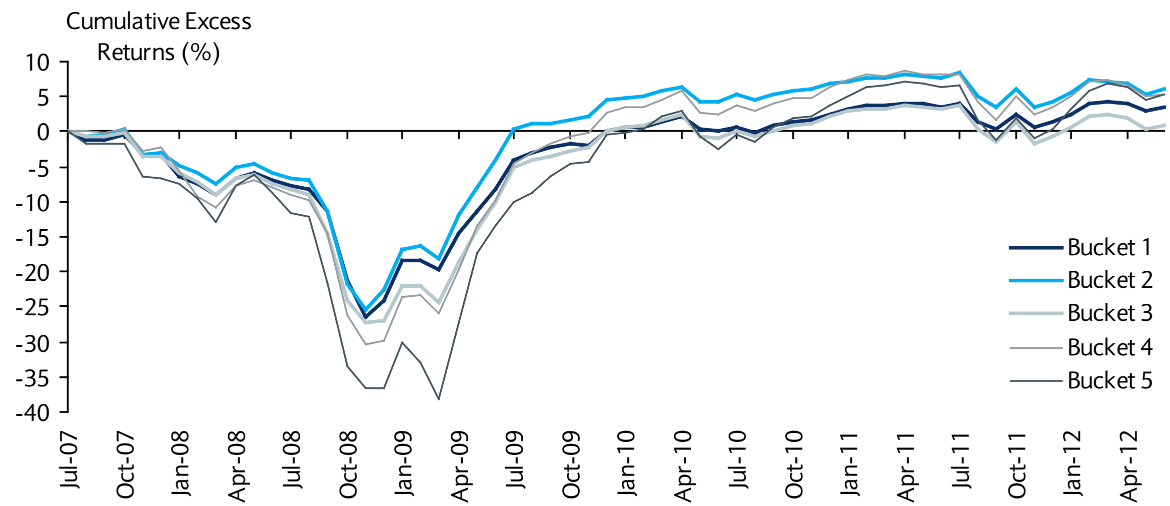
- Consistent with previous findings for CDP

Performance of CDP Tilted Index – for BAA bonds



	Return	Volatility	VaR (5%)	Drawdown
B1	0.69	7.90	(3.02)	(26.37)
B2	1.21	8.63	(3.52)	(25.45)
B3	0.20	8.64	(3.46)	(27.19)
B4	1.10	9.97	(3.88)	(30.30)
B5	1.07	12.79	(4.85)	(36.56)

Performance of CDP Buckets – for BAA bonds



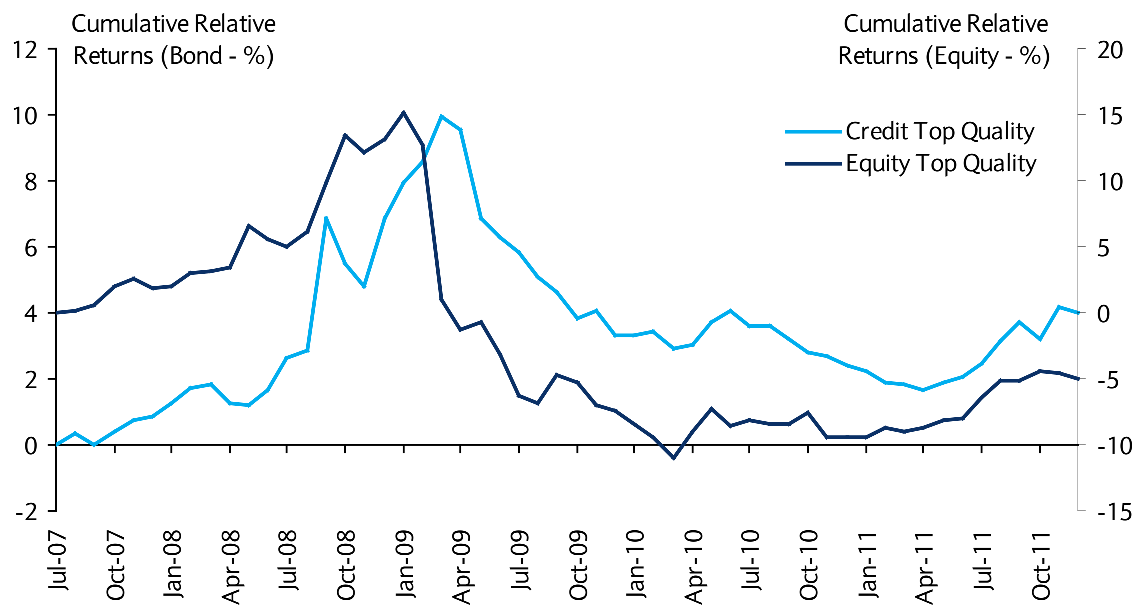
Source: Barclays Research

Comparison with Equity

- How does the behavior of a high-quality bond portfolio compare to equities?

- Construct a high-quality portfolio for US equities using POINT Quantitative Equity Scores

Relative Returns of High Quality Portfolios



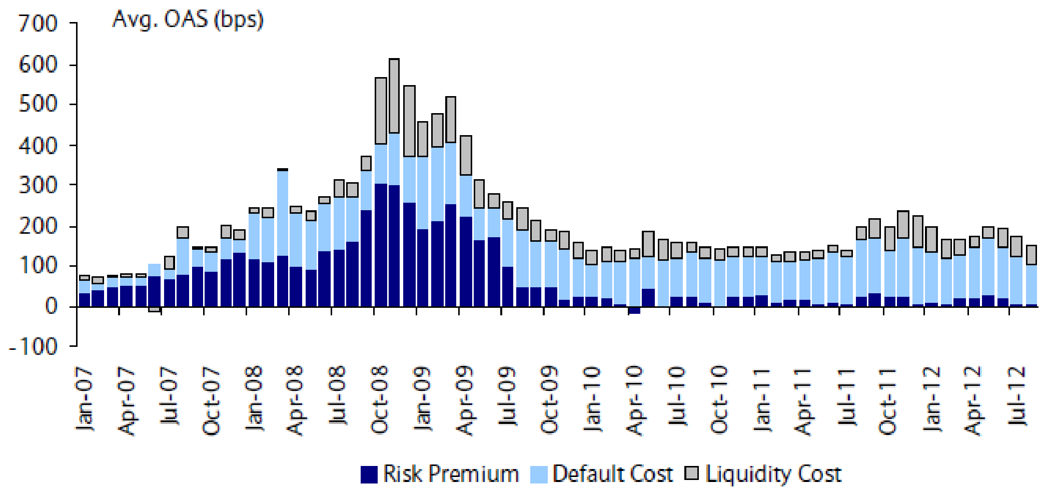
Source: Barclays Research

- Similar overall behavior - outperformance during the drawdown, underperformance in recovery

Incorporating Liquidity

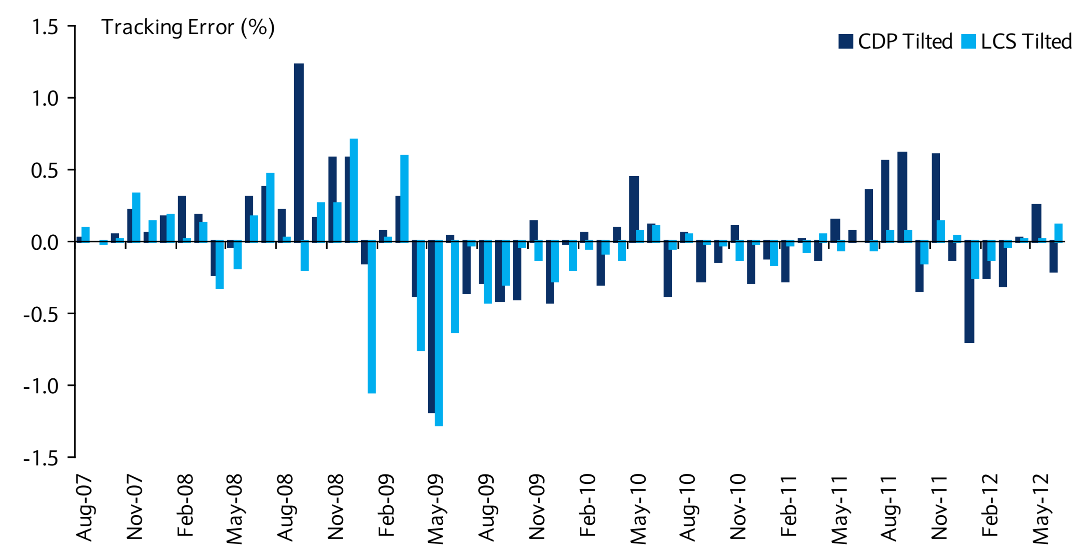
- Allows us to differentiate between issues from the same issuer
- Liquidity concerns can become important at certain times
- Default component is substantially larger and more consistent over time

Spread Decomposition of US Credit IG Index



Source: Barclays Research (LCS™ Report – Aug 2012)

Tracking Error of CDP Tilted vs. LCS Tilted Indices



Source: Barclays Research

Future Directions

- Finalize the set of variables
  - Incorporate flow metrics

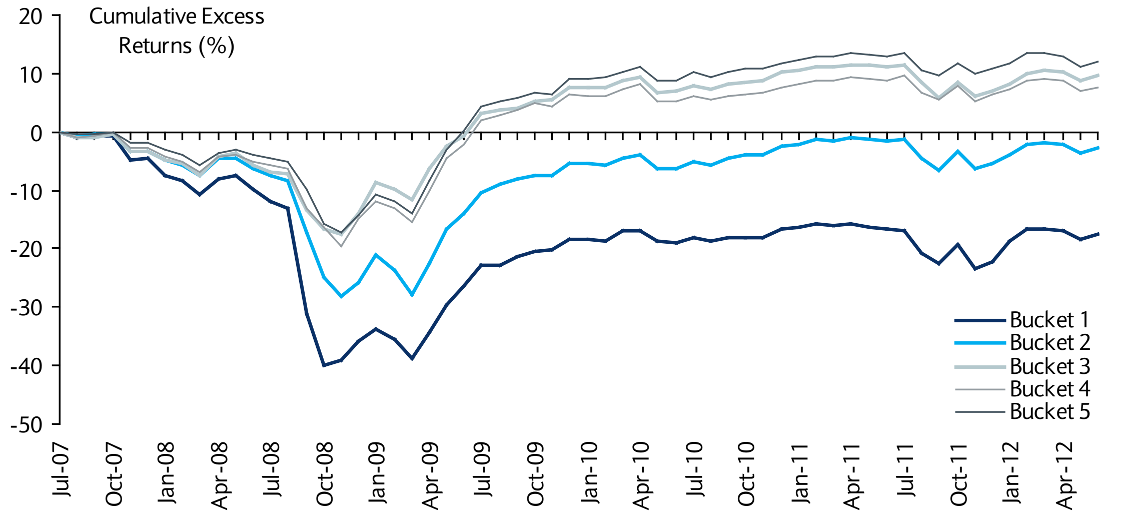
- Extend the analysis into
  - Other regions: Europe & Asia
  - High yield

- A more practical methodology for benchmark construction
  - The resulting index should be replicable
  - Underweight/overweight as a continuous function of the variable
  - Caps on issuer weights?

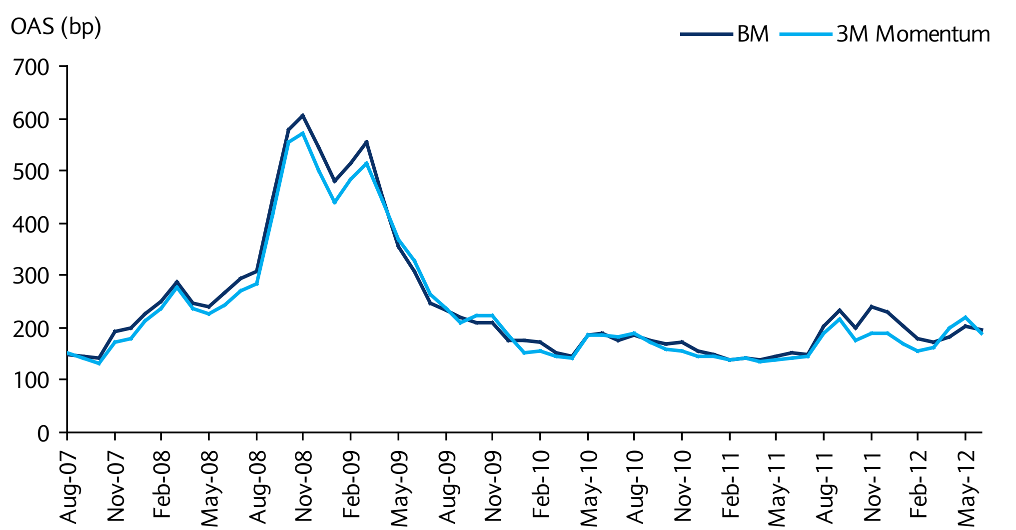
Appendix

3-Month Equity Momentum

Performance of Momentum Buckets



Spread Level for Momentum Tilted Index vs. BM



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