**MEMORANDUM**

TO: Proposed Rule: Use of Derivatives by Registered Investment Companies and Business Development Companies
(Release No. IC-31933; File No. S7-24-15)

FROM: John Lee
Senior Counsel, Division of Investment Management

RE: Meeting with Representatives of the Securities Industry and Financial Markets Association ("SIFMA") and Certain of Its Members

DATE: September 20, 2018

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On September 20, 2018, Dalia Blass (Director, U.S. Securities and Exchange Commission ("SEC"), Division of Investment Management ("IM")), Sarah ten Siethoff (Associate Director, IM), Brian McLaughlin Johnson (Assistant Director, IM), David Bartels (Senior Special Counsel, IM), Thoreau A. Bartmann (Senior Special Counsel, IM), Penelope W. Saltzman (Senior Special Counsel, IM), Roberta Ufford (Senior Special Counsel, IM), Adam Bolter (Senior Counsel, IM), Jeremy Heckerling (Senior Counsel, IM), John Lee (Senior Counsel, IM), and James Maclean (Senior Counsel, IM), met with the following representatives of SIFMA and certain of its members in person:

- Tim Cameron (SIFMA AMG);
- Jason Silverstein (SIFMA AMG);
- Andrew Ruggiero (SIFMA AMG);
- Jordan Drachman (D.E. Shaw);
- Chris Edge (T. Rowe Price);
- Ruth Epstein (Stradley);
- Matthew Klein (Vanguard);
- Arthur Leisz (GSAM);
- Michelle McCarthy-Beck (TIAA);
- Jeremy Mitzel (T. Rowe Price);
- Lars Nielsen (AQR);
- Susan Olsen (Natixis);
- Josh Ratner (PIMCO);
- Paul Stewart (Gateway);

and the following representatives of certain members of SIFMA (attending the same meeting) telephonically:

- Darcy Bradbury (D.E. Shaw);
- Lisa Cavallari (Russell);
- Rick Chan (PIMCO);
- Kevin Ehrlich (Western Asset);
- Courtney Garcia (PIMCO);
- Ahmet Kocagil (Western Asset);
- Dennis McNamara (Western Asset); and
- Wendy Yun (GSAM).

Among other things, the participants discussed the SEC's proposal relating to the use of derivatives by registered investment companies and business development companies.

Attachment

TIAA

# Selected Approaches to Managing the Impact of Derivatives

Michelle Beck
September 20, 2018

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# Disclaimer

The discussion in this presentation is intended to provide a variety of examples of how asset managers oversee the use of derivatives in their portfolios; it is not intended to specifically set forth how TIAA, or its asset management line of business, Nuveen, carry out specific practices

The statements made in the presentation reflect the opinions and experience of the presenter and do not necessarily reflect the views of TIAA

Reports and measures shown are used for illustration purposes and may not be fully internally consistent or up to date

# Overview of Derivative Management Approaches

Depending on their business mix and strategies, asset managers use a variety of approaches to control the risks associated with derivatives and other off balance sheet instruments; in this discussion we will touch on those we have seen in use:

- Effective leverage measurement and limits
- Ex ante tracking error or Value at Risk measurement and limits
- Stress test or scenario analysis approaches
- A comparison of leverage measures vs. tracking error/value at risk measures for a variety of hypothetical portfolios

# Effective leverage measurement

- This approach places derivatives on the same footing as cash instruments
- It does not adjust for the different risk of different asset classes, or debt instruments of different duration
- It is note useful for identifying the impact of derivatives that are not good hedges, or long-short positions
- It does, however, highlight the use of long leverage from whatever form in a portfolio, and allows a limit to be placed on this
- A sample definition of effective leverage:

$$\frac{\text{Balance Sheet Liabilities Par Values + Tender Option Bond Floater Par Values + [Notional Size of Total Return Derivatives - Cash Equivalents]}}{\text{Managed Net Assets + Tender Option Bond Floater Par Values + [Notional Size of Total Return Derivatives – Cash Equivalents]}}$$

Where:

- Reverse repurchase agreements are treated as Balance Sheet Liabilities

-"Total return derivatives" for this purpose mean

- total return swaps
- forward contracts delivering the total return of an asset
- credit default swaps in which credit protection is sold (as opposed to purchased)
- sold put options on a financial asset
- The term excludes currency derivatives; in a separate leverage definition that fully includes currency risk, they are included
- Interest rate swaps, and forward contracts or futures on government bonds with no more than 2 years to maturity (where the underlying government bonds fit within the permitted investment universe of the fund) are also excluded from this definition; in a separate, duration-adjusted leverage calculation, they are included
- Additionally, Total Return Derivatives that can be shown as a highly effective hedge, perfectly offsetting another holding in the portfolio, may be permitted to be excluded from the calculation.

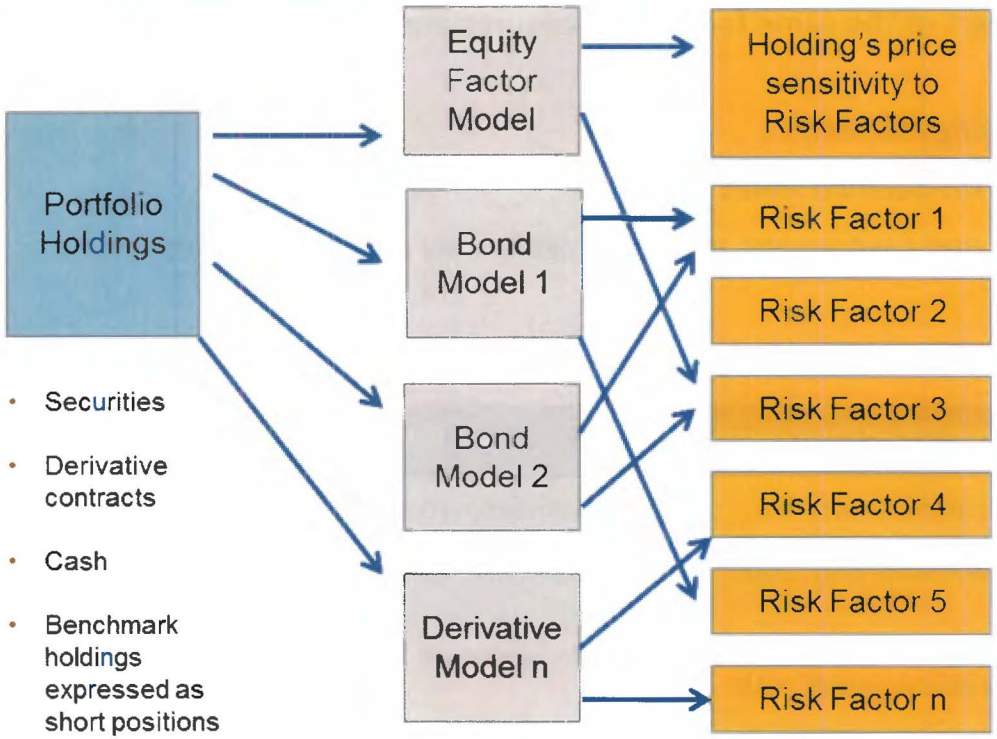
- "Managed net assets" includes all assets that were purchased through shareholder investment as well as by the proceeds of leverage

# Ex ante tracking error or value at risk measurement

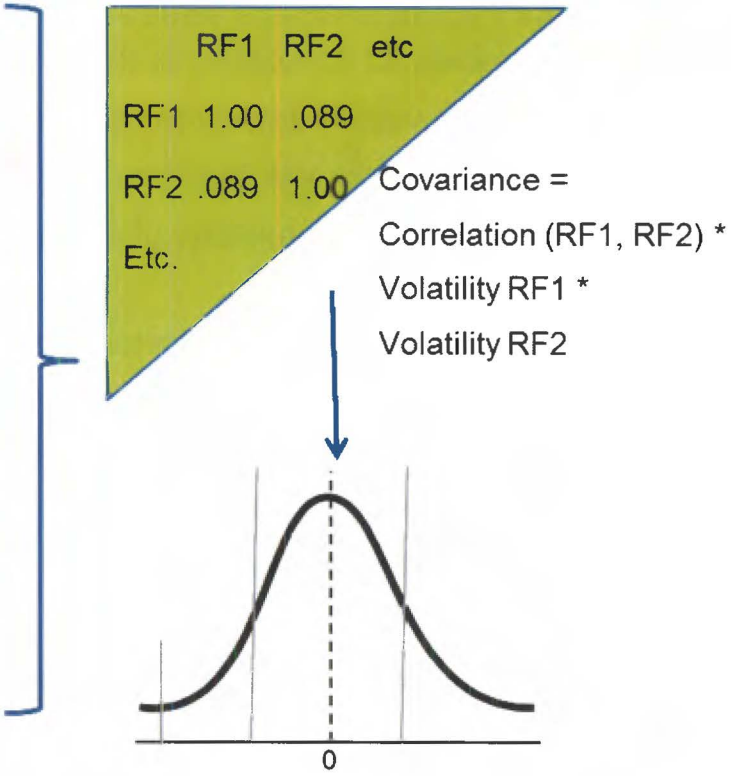
- Ex ante tracking error and value at risk are part of the same family of measures and are often used in limits systems for derivatives as they:
  - Break derivatives down into their underlying risk factors
  - Add these to the risk factors arising from on-balance sheet positions
  - Take into account volatility of derivatives and cash assets, and how highly they correlate to one another
- Differences between the two measures include:

| | Ex Ante Tracking Error | Value at Risk |
|---|---|---|
| Purpose | Estimating a portfolio's potential underperformance of a benchmark, often used by predominantly long asset managers | Estimating a portfolio's potential losses in absolute, often used by levered market participants such as banks or hedge funds |
| Treatment of benchmark | Benchmark is treated as a short position of an equivalent size to portfolio NAV | No benchmark |
| Dollars vs percentage measures | Typically measured as a percent of net asset value | Typically measured in absolute units of home currency; NAV less meaningful in presence of substantial leverage |
| Severity | Typically 1 standard deviation or 84.15% confidence | Typically between 95-99.99% confidence to estimate where capital could be exhausted |
| Forecast time horizon | Often one year: annualized potential underperformance | Often two weeks to one month |

# Illustration of an ex ante tracking error measurement process




Step ❶: "Risk Decomposition," converting holdings to risk exposures




Step ❷: Potential loss estimation—given covariance history, how much could this portfolio lose in a given time period at a given level of confidence, as a percent of NAV

*Step 2 could involve historical simulations, a type of Monte Carlo process as shown here, or other ways to estimate losses for the risk factors determined in Step 1*

# Ex Ante Tracking Error/Value at Risk Reporting and Limitation Example

| Fund | Benchmark | Effective Leverage as a % of Managed Assets 12/31/2014 | 11/28/2014 | Change in Leverage | 12/31/2014 Absolute VaR | Tracking Error (TE) | TE Threshold | TE / TE Threshold | 11/28/2014 Absolute VaR | Tracking Error (TE) | Percentage point change since 11/28/2014 in: VaR | Tracking Error (TE) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Open End Fund Group A (Equities)*** | | | | | | | | | | | | |
| Fund ABC | Russell 1000 | | | | 11.61 | 2.02 | 5.00 | 40% | [illegible] | [illegible] | 0.02 | 0.03 |
| Fund DEF | MSCI DM EAFE | | | | 10.06 | 3.56 | 7.00 | 51% | [illegible] | [illegible] | (0.12) | 0.20 |
| Fund GHI | Russell Mid Cap Growth | | | | 14.19 | 3.02 | 6.00 | 50% | [illegible] | [illegible] | (0.11) | (0.04) |
| ***Open End Fund Group B (Fixed Income)*** | | | | | | | | | | | | |
| Fund 123 | Barclays Capital Aggregate | | | | 2.51 | 1.64 | 2.00 | 82% | [illegible] | [illegible] | 0.04 | (0.09) |
| Fund 456 | Barclays Capital Int Govt | 4.4 | 5.9 | (1.6) | 1.72 | 0.83 | 1.50 | 55% | [illegible] | [illegible] | (0.01) | 0.08 |
| Fund 789 | Barclays Capital Gov/Credit 1-3 Yr | | | | 0.88 | 0.96 | 1.50 | 64% | [illegible] | [illegible] | (0.07) | (0.10) |
| Fund 012 | Barclays Capital Aggregate | 6.1 | 6.9 | (0.8) | 2.70 | 2.46 | 5.00 | 49% | [illegible] | [illegible] | 0.08 | (0.24) |
| Fund 345 | Barclays Capital Global High Yield | | | | 3.05 | 1.01 | 3.00 | 34% | [illegible] | [illegible] | (0.14) | (0.05) |
| ***Closed End Fund Group C (Muni Bond)*** | | | | | | | | | | | | |
| Fund AAA | S&P Municipal Bond Index | 34.4 | 34.6 | (0.2) | 5.58 | 2.62 | 5.25 | 50% | [illegible] | [illegible] | (0.35) | 0.12) |
| Fund BBB | S&P Municipal Bond State A Index | 27.5 | 27.7 | (0.2) | 6.29 | 2.14 | 5.00 | 43% | [illegible] | [illegible] | (0.53) | 0.28 |
| Fund CCC | S&P Municipal Bond State B Index | 28.0 | 28.1 | (0.1) | 6.52 | 2.15 | 5.00 | 43% | [illegible] | [illegible] | (0.22) | 0.18 |
| Fund DDD | S&P Municipal Bond Index | 35.4 | 35.9 | (0.5) | 5.78 | 2.85 | 5.25 | 54% | [illegible] | [illegible] | (0.64) | (0.38) |
| Fund EEE | S&P Municipal Bond Index | 32.7 | 32.8 | (0.1) | 4.61 | 1.88 | 5.25 | 36% | [illegible] | [illegible] | (0.73) | (0.43) |
| Fund FFF | S&P Municipal Bond Intermediate Index | 35.1 | 35.3 | (0.1) | 4.02 | 2.94 | 3.50 | 84% | [illegible] | [illegible] | (0.21) | (0.07) |
| Fund GGG | S&P Municipal Bond Intermediate Index | | | | 2.32 | 0.60 | 2.00 | 30% | [illegible] | [illegible] | (0.11) | 0.01 |
| Fund HHH | S&P Municipal Bond Index | 37.2 | 37.3 | (0.1) | 5.90 | 2.95 | 5.25 | 56% | [illegible] | [illegible] | (0.65) | (0.42) |
| Fund III | S&P Municipal Bond Intermediate Index | 36.0 | 36.1 | (0.1) | 3.40 | 1.63 | 2.50 | 65% | [illegible] | [illegible] | (0.13) | (0.02) |

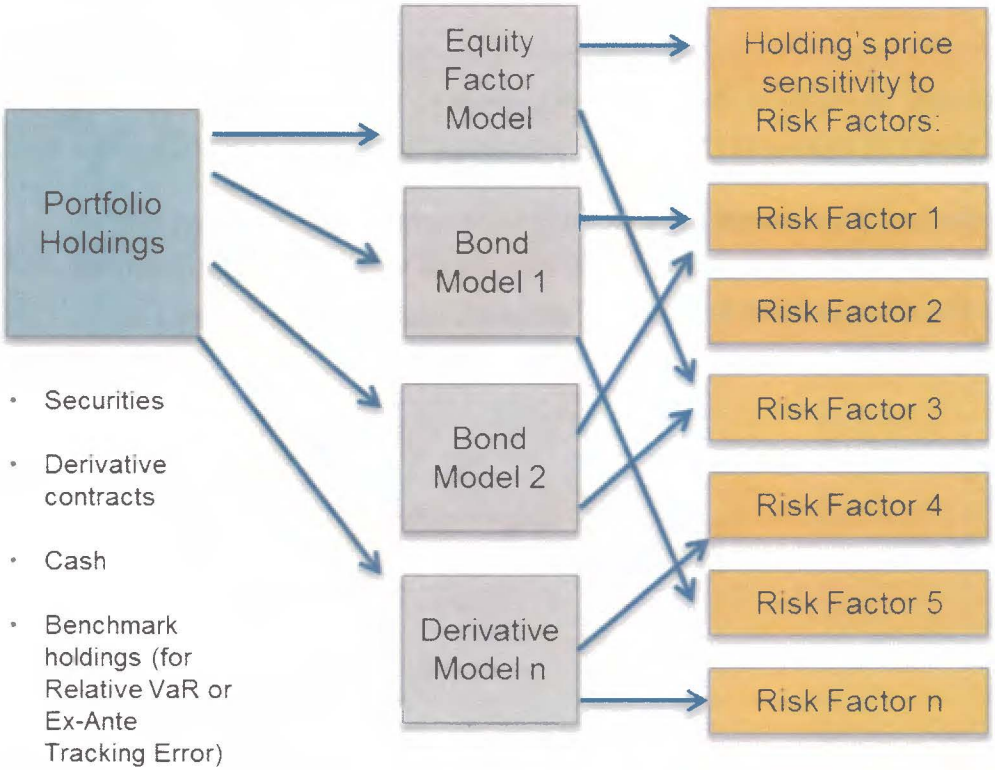
Different firms approach limitations on these types of measures differently; they are typically not board approved, but boards may be aware of the role they play in helping flag the impact of derivatives

# Stress test or scenario analysis approaches

- Like ex ante tracking error and value at risk, a stress test
  - Breaks derivatives into underlying risk factors
  - Adds these to the risk factors from the underlying cash positions
  - In the case of ex ante tracking error, does the same for the benchmark, treating it as a short position
- Instead of subjecting these risk factor positions to a given statistical manipulation of financial market history, a stress test may:
  - Pick an actual short period of market history that was uniquely stressful
  - Create hypothetical stresses that may affect all, or only some, risk factors, to challenge both the volatility and correlation assumptions underlying typical tracking error/VaR models
- A positive quality of stress tests is that they can help step away from the statistical assumptions and historical period underlying ex ante tracking error and VaR, to avoid blind spots created by these
- Negative qualities include:
  - There is effectively an infinite number of scenarios, and no guarantee that the "right" one will be applied to flag a given circumstance
  - It is more difficult, arbitrary, and potentially unnecessarily binding, to place a limit on a given scenario
  - A portfolio that passes all scenarios without harm contains either Tbills (in the case of absolute risk) or the index (in the case of benchmark-relative stresses), and is unlikely to meet any other investment objectives

# Illustration of a stress test process

- **Allows understanding of the impact of events when all correlations move to 1, or 0, and the "beyond 99% confidence" events occur**




Step ❶: "Risk Decomposition," converting holdings to risk exposures

- Take the portfolio's sensitivity to all risk factors and subject it to:
  - Price changes across the risk factors from actual historical events, or
  - Price changes from hypothetical events
- For portfolios with significant option exposures, analysis is enhanced by:
  - recording each holding's price sensitivity to not just small upward changes in each risk factor, but also to larger changes, of both signs
  - then applying scenarios to the right price sensitivity
- Captures the behavior of options and the convexity of bonds

Step ❷: Potential loss estimation—multiply sensitivity to each risk factor by that risk factor's change in the specified scenario

# Comparison of leverage and VaR measures for hypothetical portfolios

- The set of portfolios in the pages that follow was created to compare leverage measures, and VaR measures, for different portfolios.
- Several are reasonable and typical portfolios similar to many in the asset management industry, meant to show how these measures are sensitive to different levels of riskiness ("standard portfolios")
- There is also a set that are not typical in the industry; these were pure fiction, not representative of any known mutual fund strategy, and were only included to show how effectively these measures would identify uses that might be surprising or considered too risky for the mutual fund investors ("unusual, high risk portfolios")

# Description of hypothetical "standard" portfolios

| Portfolio | Strategy | Net Asset Value | Benchmark Index | Securities Holdings | Securities Market Value | Derivatives Holdings | Derivatives Notional Value | Derivatives Market Value* | Margin (Encumbered Cash) | Free Cash |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Short Term Fixed Income Perfect Hedge | Long-only, short term, very high quality fixed income fund, targeting duration sensitivity of 3-4 years, uses derivatives to perfectly match-hedge | $100 | Barclays Govt/Credit 1-3 Yr | 5 year U.S. Government Bonds | $90 | Short 5 year U.S. Government Note Futures | ($20) | $0 | $1 | $9 |
| 2. Short Term Fixed Income Slight Mismatch Hedge | Same as portfolio 1, but takes some risk that the yield curve will not move in a parallel fashion | $100 | Barclays Govt/Credit 1-3 Yr | 5 year U.S. Government Bonds | $90 | Short 3 month LIBOR Futures | ($400) | $0 | $1 | $9 |
| 3. Cash Equitizer | Long-only U.S. equity fund that seeks to closely match the S&P 500 Index, maintains long equity futures positions equal to cash balances in order to achieve 100% equity investment | $100 | S&P 500 | U.S. equity portfolio well matched to the S&P 500 Index | $95 | Long S&P 500 Index Futures | $5 | $0 | $1 | $4 |
| 4. International equity currency hedger | Long-only international equity fund sold to U.S. investors that seek the returns of international stock markets without the non-USD currency risk. Each day the fund enters into a periodically rolls foreign exchange forward contracts to remove all sensitivity to movements in the currencies of the stocks in which it invests. | $100 | MSCI Europe Asia Far East USD Hedged | International stock portfolio well matched to the MSCI EAFE Index | $98 | Short 1 month foreign currency forwards proportionate to the currency exposures of the international stock portfolio | ($98) | $1 | $0 | $1 |
| 5. 130/30 Long/Short Equity | This long/short fund purchases U.S. equities, and sells U.S. equities short, striving to maintain a consistent long position of $130 and a short position of $30. | $100 | Russell 1000 | Long U.S. Stocks closely matching the Russell 1000 Growth Index<br><br>Short U.S. Stocks closely matching the Russell 1000 Value Index | $130<br><br>($30) | No derivatives | $0 | $0 | $0 | $0 |
| 6. Risk Parity Fund | This long-only fund invests in major asset classes in inverse proportion to risk (so that each asset class investment is equally risky), managed to a target annual volatility of 10% | $100 | 60% MSCI World, 40% Barclay's Global Aggregate Bond | No securities | $0 | 200% Government bond futures, 60% Index CDS (sell protection) , 30% Index equity futures, 40% Commodity futures, all diversified long exposures | $330 | $0 | $15 | $85 |
| 7. Managed Futures Fund | Go long all types of futures contracts where price is going up fastest within type, short futures contracts where price is going down fastest within type, maintain diversification and offset, target 10% annualized volatility | $100 | None/Cash | No securities | $0 | 300% Interest rate and bond futures, 50% Equity futures, 150% Commodity futures, 100% Currency futures, with roughly equal long and short positions within each category | $600 | $0 | $25 | $75 |

*To simplify these examples, in several cases we used a market value of zero, suggesting a derivative product that has just been entered into, before any market movements have occurred*

# Description of hypothetical "unusual, high risk" portfolios

| Portfolio | Strategy | Net Asset Value | Benchmark Index | Securities Holdings | Securities Market Value | Derivatives Holdings | Derivatives Notional Value | Derivatives Market Value* | Margin (Encumbered Cash) | Free Cash |
|---|---|---|---|---|---|---|---|---|---|---|
| 6. Short Term Fixed Greater Mismatch Hedge | Same as portfolio 2, but uses derivatives on a different sovereign market to hedge U.S. treasuries | $100 | Barclays Govt/Credit 1-3 Yr | 5 year U.S. Government Bonds | $90 | Short 10 year German Bund Futures | ($10) | $0 | $1 | $9 |
| 7. "Go anywhere" low volatility strategy fund | This long/short fund can enter into swaps, futures or forward contracts with an objective of delivering a return of Tbills + 4.00%. It pairs long and short trades, or purchases options or credit default swaps, to express relative value expectations, sizing the trades to stay within its stated modest return expectations | $100 | Cash | No securities | $0 | Long protection credit default swap on the North American High Yield Index | $50 | ($1.05) | $2 | $98 |
| | | | | | | Long 3 month JPY/USD foreign currency forward | $10 | $0.50 | | |
| | | | | | | Short 3 month HKD/USD foreign currency forward | ($10) | ($0.10) | | |
| | | | | | | Long 10 year German Bund Futures | $20 | $0.25 | | |
| | | | | | | Short 10 Year U.S. Government Futures | ($20) | ($0.10) | | |
| | | | | | | Long S&P 500 Index Futures | $10 | $1.00 | | |
| | | | | | | Short Russell 3000 Index Futures | ($10) | ($0.50) | | |
| 8. Levered long equity fund | This long-only fund uses derivatives to magnify its U.S. stock positions by 20%. | $100 | Russell 1000 | Long U.S. Stocks closely matching the Russell 1000 Index | $95 | Long Russell 1000 Index Futures | $20 | $0 | $1 | $4 |
| 9. Extreme energy fund | This long/short hedge fund has an open mandate to take high risk in pursuit of gain. It can invest in any strategy but has recently focused in energy stocks and futures contracts | $100 | Cash | No securities | $0 | Long total return swap on Alerian MLP Index | $100 | $0 | $7 | $93 |
| | | | | | | Short Natural Gas Futures | ($100) | $0 | | |

# Leverage and VaR measures for hypothetical portfolios

| Portfolio | Net Asset Value | Gross Notional including Derivatives Notional, Financial Commitment Transactions, and On Balance Sheet Holdings (Securities & Cash & Derivative Market Value) | Gross Notional, With Perfect Hedges Exempted | Gross Notional, With All Hedges Exempted | Gross Notional, Weighted as Per BIS Margin Table | Gross Notional Per BIS Margin Weighting Exempting Perfect Hedges | Portfolio VaR inclusive of Derivatives (1 mo 99%) | Benchmark VaR (1 mo 99%) | Portfolio VaR - Benchmark VaR |
|---|---|---|---|---|---|---|---|---|---|
| ***Standard portfolio derivative strategies*** | | | | | | | | | |
| 1. Short Term Fixed Income Duration Matched Hedge | $100 | 119 | 99 | 99 | 102 | 99 | 1.9% | 0.6% | 1.3% |
| 2. Short Term Fixed Income Slight Mismatch Hedge | $100 | 499 | 499 | 99 | 127 | 127 | 2.2% | 0.6% | 1.6% |
| 3. Cash Equitizer | $100 | 104 | 104 | 104 | 104 | 104 | 7.9% | 7.9% | 0.0% |
| 4. International equity currency hedger | $100 | 198 | 100 | 100 | 139 | 100 | 6.7% | 6.7% | 0.0% |
| 5. 130/30 Long/Short Equity | $100 | 160 | 160 | 100 | 160 | 160 | 10.6% | 10.8% | -0.2% |
| 6. Risk Parity Fund | $100 | 330 | 330 | 330 | 120 | 120 | 6.6% | 7.3% | -0.7% |
| 7. Managed Futures Fund | $100 | 600 | 600 | 600 | 290 | 290 | 6.1% | 0.0% | 6.1% |
| | | | | | | | | | |
| ***Unusual, hypothetical uses of derivatives*** | | | | | | | | | |
| 8. Short Term Fixed Greater Mismatch Hedge | $100 | 109 | 109 | 99 | 102 | 102 | 2.2% | 0.6% | 1.6% |
| 9. "Go anywhere" low volatility strategy fund | $100 | 228 | 228 | 148 | 170 | 170 | 2.6% | 0.0% | 2.6% |
| 10. Levered long equity fund | $100 | 119 | 119 | 119 | 119 | 119 | 9.6% | 8.0% | 1.6% |
| 11. Extreme energy fund | $100 | 293 | 293 | 293 | 293 | 293 | 19.6% | 0.0% | 19.6% |

- The riskiest fund in VaR terms is (11) Extreme Energy—but under many leverage measures it does not appear particularly risky
- While (5) 130/30 Long/Short Equity has the second highest VaR, it is lower than its long-only benchmark because of the mix of stocks it has chosen
- (7) Managed futures fund is middle of the pack on VaR but has some of the highest leverage measures
- (2) Short Term Fixed Income portfolio stands out with the greatest measurement mismatch. Its use of Eurodollar futures racks up high leverage measures under simpler approaches, yet its VaR remains low as the basis risk it is assuming is still relatively small