UCITS IV Risk Requirements: The VaR Approach

Executive Summary

- The European Union recently approved new regulation on mutual funds called UCITS IV (Undertakings for Collective Investment in Transferable Securities, fourth edition). UCITS IV, which is patterned on regulatory risk requirements for banks, provides two approaches to regulatory risk management of a fund's portfolio: the Commitment Approach and the Value-at-Risk (VaR) Approach.
- Funds that use derivatives more extensively often opt for the VaR approach. The VaR fund must establish, implement and maintain a documented system of internal limits for the measures used to satisfy the regulatory requirements.
- Western Asset establishes warning levels that are lower than the regulatory maximum limit, as well as escalation procedures, to better manage the risks of the portfolios.
- Western Asset performs stress tests for portfolios on at least a monthly basis, including every time the VaR exceeds the orange warning level for more than two consecutive days and when the daily loss is higher than the estimated VaR.

The European Union recently approved new regulation on mutual funds called UCITS IV (Undertakings for Collective Investment in Transferable Securities, fourth edition). UCITS IV, which is patterned on regulatory risk requirements for banks, provides two approaches to regulatory risk management of a fund's portfolio: the Commitment Approach and the VaR (Value-at-Risk) Approach. A UCITS IV fund, through its board of directors, has to select the approach that best fits the investment activities of the portfolio.

In the Commitment Approach, the net exposure of derivatives cannot exceed 100% of the fund's net asset value (NAV). There are complex rules to translate the derivatives held by the portfolio into equivalent amounts of underlying assets. Other rules concern the process of netting offsetting exposures to come up with a final exposure of derivatives, also called "global exposure" or leverage.

Funds that use derivatives more extensively often opt for the VaR approach. They can choose between relative and absolute VaR limits. The relative approach uses a ratio of up to 200% between the VaR of the portfolio and the VaR of a reference portfolio. The absolute approach is generally used when there is no reference portfolio or benchmark; it allows the one-month VaR to be up to 20% of the NAV. UCITS IV establishes strict rules for the computation of VaR and requires regular stress- and back-testing to complement VaR estimation.

UCITS IV requires VaR to be computed on at least a daily frequency. Depending on the strategy being pursued, intraday calculations may also be necessary. The VaR fund must establish, implement and maintain a documented system of internal limits for the measures used to satisfy the regulatory requirements. UCITS IV indicates that the VaR process must meet the following parameters and standards:

- One-tailed confidence interval of 99%.
- Horizon equivalent to one month.
- Effective observation period (history) of risk factors of at least one year.
- Must take into account idiosyncratic and default risks.
- Must include all positions and derivatives.
- Must take into account basis risks, and second-order and nonlinear risks.

Western Asset currently uses the Barclays Point® Tail-Risk Model as its UCITS IV VaR calculator. Point is a well-established, well-documented and widely used tool within the asset management industry.

The Point risk model has the ability to display systematic, idiosyncratic and default risks both at the portfolio and at the security level. Idiosyncratic risks are risks that affect one specific position of the portfolio, while systematic risks affect the whole market or an entire market segment. The combination of the three risk components forms the overall portfolio risk. Systematic risks covered by Point include interest rate curve (term structure), currency, credit spread, volatility and basis risks.

Point associates a bundle of risk factors to each financial instrument used in the portfolio. Over 600 risk factors are modeled by the system, including the systematic risks noted above. Interest rate positions are mapped to key rate durations to better capture term structure risk. The model also uses second-order parameters such as gamma and convexity to better represent the nonlinearity of instruments at the total-portfolio level.

A common assumption in financial settings is that returns are lognormally distributed—that is, the logarithms of (1+returns) form a normal (Gaussian) distribution, a pattern that looks like a bell-shaped curve. The Point Tail-Risk Model does not assume that factor returns are lognormally distributed. Fat-tailed distributions are calibrated to historical returns, assigning a higher probability to large losses (tail events) than the normal distribution would; this is empirically closer to the reality of financial markets.

The model uses special techniques to model the co-dependence of risk factors. A Monte Carlo simulation is used to calculate VaR numbers at a portfolio level: The system simulates thousands of scenarios based on the assessed behaviours of the risk factors and their relationships, and estimates the possible future behaviour and risk of the portfolio as a whole.

Central risk scenarios are evaluated using recent market information, while tail risks—the rarer events—are modeled using the full historical dataset. We believe that given the high confidence level required by regulation, shorter observation periods that focus only on recent events are not appropriate.

Western Asset establishes warning levels that are lower than the regulatory maximum limit, as well as escalation procedures, to better manage the risks of the portfolios.

Yellow Level

- Around 70% of the maximum regulatory limit, depending on the product.
- Discussion takes place among Portfolio Management (PM), Risk Management (RM), and Portfolio & Quantitative Analysis departments of Western Asset.

Orange Level

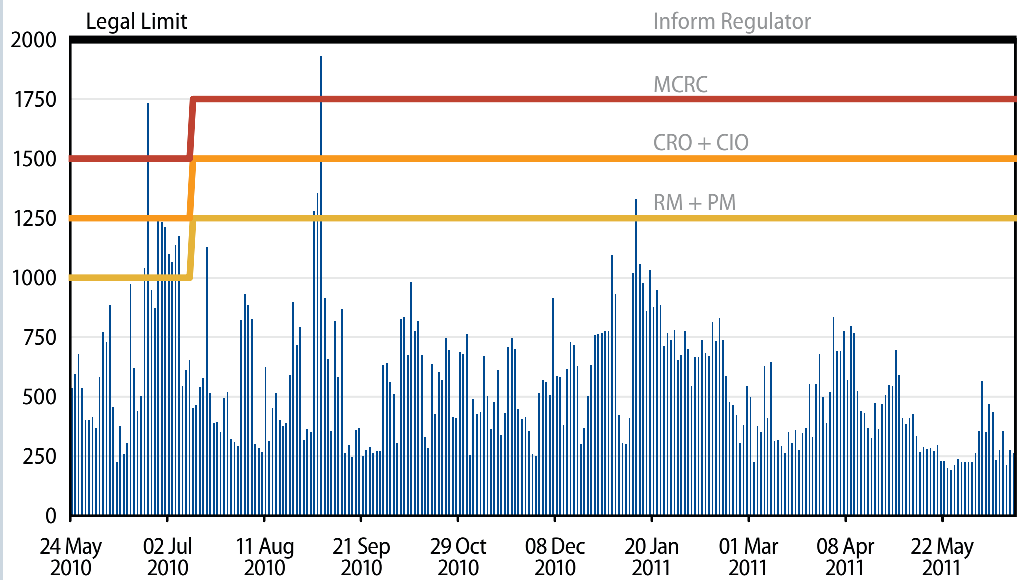
- Around 80% of the maximum regulatory limit, depending on the product.
- Discussion takes place between Chief Risk Officer (CRO) and the Market and Credit Risk Committee (MCRC).

Red Level

- Around 90% of the maximum regulatory limit, depending on the product.
- Discussion takes place between CRO and MCRC.
- Bias to reduce systematic risk.

Exhibit 1 is an example of the VaR history of a UCITS fund managed by Western Asset:

Exhibit 1
99% Monthly VaR in bps (Barclays Point®)

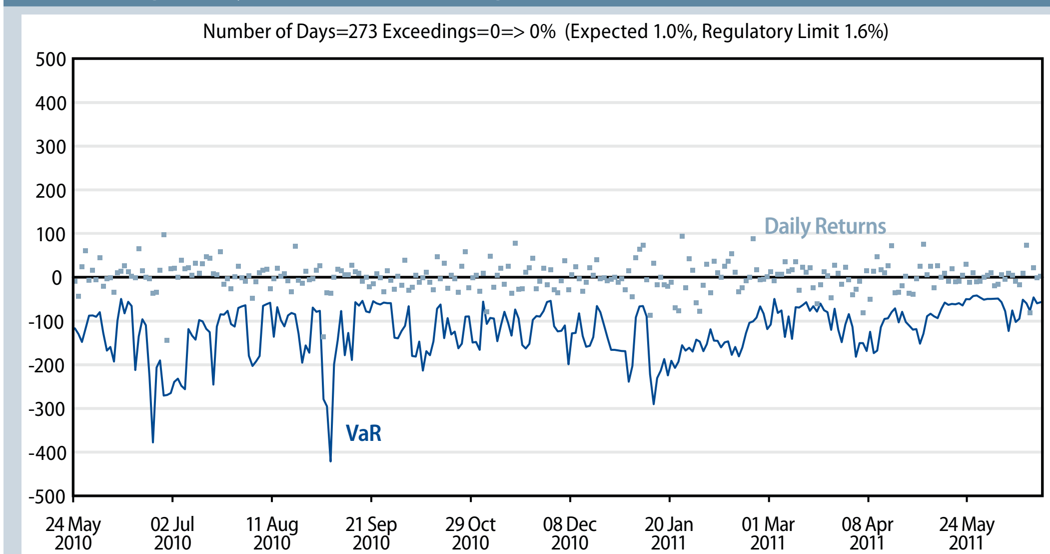


Source: Western Asset

The backtesting requirements of the regulation are also strict. The intent is to closely monitor the accuracy and performance of the VaR model used. Backtesting of the VaR model should be performed at least once a month, using daily data. By definition, a 99% confidence level daily VaR is a loss that the fund is not expected to exceed on more than 1% of days. A common way to backtest a VaR model is to observe the realized returns of the fund and check the frequency at which they exceed the VaR number calculated by the model. For UCITS backtesting, if a loss exceeding the calculated VaR (called an exceedance) occurs much more often than once every 100 days (1% of the time), it means that the model underestimates the real risk of the fund. It is expected that two to three exceedances occur per year (1% of 250 business days is 2.5). Western Asset considers that up to four annual exceedances are acceptable, in accordance with UCITS rules.

Exhibit 2 shows an example of the backtest performed to check the accuracy of the VaR model used to monitor UCITS funds.

Exhibit 2
Backtesting—Daily Returns and VaR Range



Source: Western Asset

Western Asset performs stress tests for portfolios on at least a monthly basis, including every time the VaR exceeds the orange warning level for more than two consecutive days and when the daily loss is higher than the estimated VaR.

Interest rates, credit spreads and currencies are submitted to shocks created by Western Asset's risk management group, which is independent from the investment team. Scenarios are designed to account for situations not encompassed by the VaR model, such as unexpected changes in correlations or changes in risk factors that are more severe than projected. Western Asset attempts to keep scenarios plausible, relevant to the developments in financial markets, and adapted to the evolution of the economic/financial environment.

Exhibit 3 is an example of a stress test run for a fund that uses the absolute VaR approach:

Exhibit 3
Scenario Analysis

		Risk Factors / Asset Classes	Factor Sensitivities	Representative Data Series	Current Value	Historic Volatility (18m)	1-Standard Deviation Shock	Isolated Tracking Error	Stress Shock	Scenario Impact
Rates	US	0–4yr Nominal Rates	-0.29	USGG2YR	0.47	89%	40	-12	-25	-7
		4–30yr Nominal Rates	0.27	USGG10YR	3.06	31%	90	26	-75	20
	Europe	0–4yr Nominal Rates	-0.04	GDBR2	1.61	69%	110	-5	-50	-2
		4–30yr Nominal Rates	0.69	GDBR10	3.02	25%	70	52	-50	35
	Asia	0–4yr Nominal Rates		GJGB2	0.18	49%	10			
		4–30yr Nominal Rates		GJGB10	1.17	30%	30			
Spreads		Agencies / Supras								
		Sr / LT2 Financials		ML EB3A	136	26%	40		150	
		T1 / UT2 Financials		ML ET10	522	51%	270		700	
		Industrials / Utilities	-0.82	ML EJ00 / EK00	118	22%	30	-21	75	61
		High-Yield		ML H0A0	509	26%	130		500	
		ABS Agency MBS								
		Non-Agency MBS								
		Main		ITRAXX-EUROPE	102	51%	50		100	
		Xover	-0.08	ITRAXX-XOVER	370	45%	160	-13	500	38
		FINSEN		ITRX EUR SNR FIN	157	68%	110		100	
		CDX IG		CDX-IG	89	45%	40		100	
		SOVX		ITRX SOVX WE	197	70%	140		100	
Currencies		EUR	-9%	USD / EUR	1.44	11%	16%	-143	-5%	44
		GBP								
		JPY								
		CAD								
		AUD	-9%	USD / AUD	1.07	14%	14%	-136	-10%	94
Options		Main CDS		ITRAXX-EUROPE	102	51%	53		100	
		XOVER CDS		ITRAXX-XOVER	370	45%	165		500	
		FINSEN		ITRAXX-FINSEN	157	68%	107		100	
		CDX IG		CDX-IG	89	45%	40		100	
		ITRX SOVX WE	0.72	ITRX SOVX WE	197	70%	137	98	100	-209

CDS Factor Sensitivities must be calculated manually

Perfect Correlated Tracking Error	518
Zero Correlation Tracking Error	230
Carry / Yield Advantage	-1
Total Return Under Scenario	74

Source: Western Asset

In summary, UCITS IV regulation contains many requirements for European funds that are patterned on bank regulation. In this white paper, we have described Western Asset's approach to satisfying these regulations, in particular VaR monitoring, which is generally used for the most sophisticated funds.