An Evaluation of

Systematic Trend Following Strategy Benchmarks

PCA PENSION CONSULTING ALLIANCE

The evaluation of systematic trend following strategies presents some unique challenges. But effective tools are available.

Systematic Trend Following (STF) is a long-standing investment strategy that involves buying ("going long") markets that have been rising and selling ("going short") markets that have been declining in the belief that those price trends will continue. The markets traded by STF managers typically include equity markets, interest rate markets, currency markets and commodity markets. Trend following has existed for centuries, marking it as a long-running and established investment strategy.[1] Trend following distinguishes itself by exhibiting a high degree of liquidity and low average correlation to major markets such as equities and government bonds. Historically, this has provided substantial diversification for investors who are typically heavily invested in stocks and bonds and are, thus, in need of diversification if both or either sell off dramatically.

There is a need to benchmark systematic trend followers.

As with all managers, there is a need to benchmark systematic trend followers to gauge the value provided by managers implementing similar strategies on behalf of their clients. A benchmark is used to evaluate the chosen approach versus a simple, investible, low cost alternative. The various benchmarks available, and PCA's views on them, are the main topic of this discussion.

As noted by the CFA Institute's recommendations on best practices for portfolio evaluation and attribution, any given benchmark should exhibit the following ideal characteristics: i) be unambiguous and replicable, ii) investable, iii) measurable, iv) appropriate (i.e., should accurately reflect the full opportunity set open to managers in the investment space), and v) specified in advance[2]. However, alternative investment strategies, such as STF, can pose obstacles to ideal benchmarking, given the wide range of styles, financial instruments, and approaches used by different managers. Furthermore, there is no market capitalization weighted benchmark analogue for STF. There is no "passive" benchmark for trend following, only a "simple" trading system that can be implemented inexpensively and systematically without discretionary intervention. This results in a lack of a single "perfect" benchmark for broad allocations, especially those including a lineup of strategies that target different opportunity sets or pursue different goals.

To surmount these challenges, investors and advisors often opt to select and track a series of several different benchmarks, each of which serves a unique function in gauging managers' relative performance. We have found three especially useful indexes in the STF space, listed below. Detailed index descriptions and performance analysis follow.

HIGHLIGHTED INDEXES:

Mt Lucas Management's MLM Global Index (15V)

The Credit Suisse Managed Futures Liquid Index (15% Volatility)

Societe Generale's SG Trend Index

1 Source: Brian Hurst et Al., "Demystifying Managed Futures" Journal of Investment Management, 3rd Quarter 2013

2 The CFA Institute also recommends several additional properties – the acknowledgement of a chosen benchmark by the asset manager, the accountability for performance versus that benchmark, and the asset manager's complete understanding of the benchmark's contents. However, given that these properties deal more with communication between managers and clients than with benchmark evaluation at the asset class level, they lie somewhat beyond the scope of our paper. Source: John Maginn, Donald Tuttle, Jerald Pinto and Dennis McLeavey, "Benchmarks" in *Managing Investment Portfolios: A Dynamic Process*, Third Edition. Charlottesville, VA, CFA Institute, 2012): 131-143.

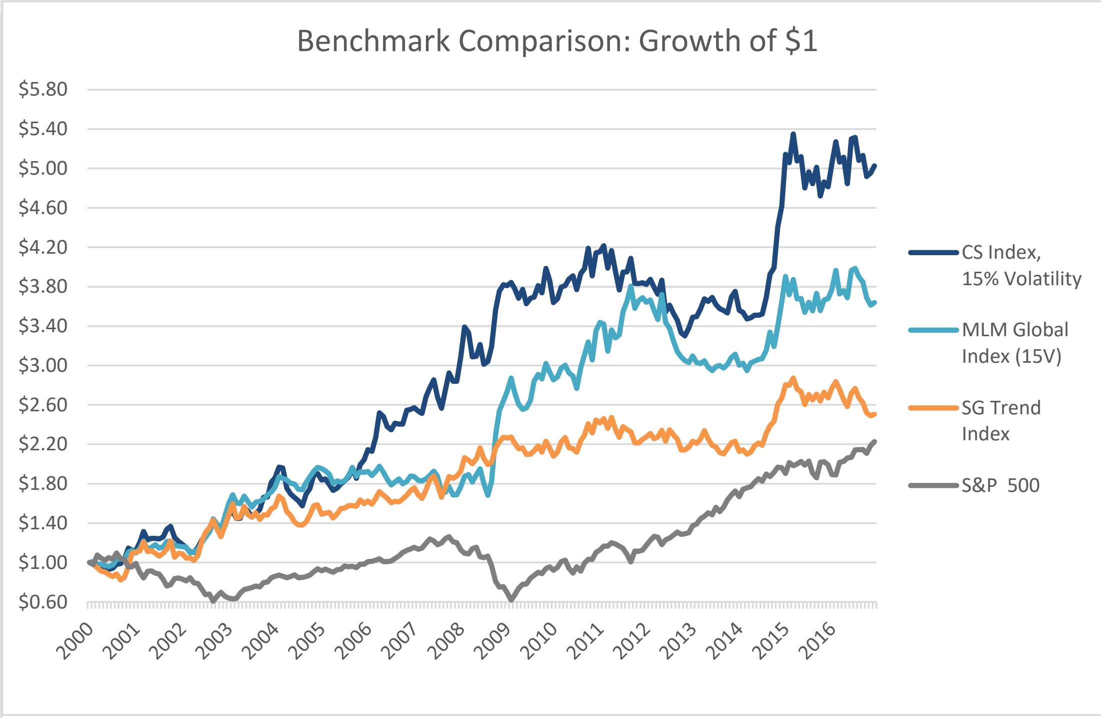
Highlighted STF Indexes

1) Mt Lucas Management's MLM Global Index (15V). This index contains a portfolio of 28 different, liquid futures contracts that encompass a variety of exposures in currency, commodity, global equity and fixed income markets. It targets trends based on two lookback windows (3 months and 12 months) and its contents are rebalanced once a month. The two lookback windows are given equal weighting, as are the futures contracts within each of the index's four asset classes. The asset classes themselves are weighted based on historical volatility with the aim of roughly equal risk contributions. The 15V variation of index, which is 3.5x levered based on notional capital, brings investors closer to the 15% to 18% average volatility of equity markets, a level that we recommend targeting for STF allocations. However, it should be noted that although the MLM indexes are categorized based on overall levels of volatility, they do not explicitly target volatility; this index is constructed based on percent of notional capital, so trailing volatility measures are outcomes, not inputs to index construction.

2) The Credit Suisse Managed Futures Liquid Index (15% target volatility variation) This index contains a portfolio of 18 of the most liquid futures contracts and commodities futures indexes found across all four major asset classes (equities, currencies, commodities and fixed income). Asset class allocations and positions are volatility-weighted based on the portfolio's overall targeted volatility. Buy and sell signals are triggered by straightforward measures calculated using 16 different moving averages, and positions are rebalanced daily. Note that this index is calculated at target volatilities of 10%, 15%, 18%, and 20%, allowing clients to utilize a benchmark para-mutation that best fits their manager's, and portfolio's, target volatility.

3) Societe Generale's SG Trend Index (formerly Newedge Trend). This benchmark is composed of the 10 largest trend following strategies (based on assets under management) that remain open to new investment. The benchmark attempts to represent the trend-following section of the managed futures space. Each underlying strategy (fund) carries an equal weighting in the index.

Relative index performance for each benchmark is shown below, alongside that of the S&P 500 for comparison



All three STF indexes show high levels of correlation to one another during this period, while volatilities vary. Applying benchmarks with similar levels of volatility to one another is important. In addition, all benchmarks are negatively correlated to equities (the S&P 500 Index).

BENCHMARK CORRELATIONS

	S&P 500	SG Trend	CS	MLM Global (15V)
S&P 500	1.00			
SG Trend	(0.14)	1.00		
CS	(0.23)	0.78	1.00	
MLM Global (15V)	(0.40)	0.69	0.77	1.00

ANNUALIZED STANDARD DEVIATIONS

	5Y	10Y	15Y
S&P 500	10.36%	15.28%	14.35%
SG Trend	10.51%	11.69%	13.02%
CS	13.66%	14.38%	14.76%
MLM Global (15V)	12.16%	16.18%	15.01%

Pros and Cons: We explore the advantages and disadvantages of the three different benchmarking options below:

The MLM Global Index: The main advantages of this index series are the MLM team's long history of creating and running high quality benchmarks (the original MLM index has been run live since 1993, though the index construction we highlight for this paper, which includes equity, is newer) and their benchmarks' straightforward and transparent construction, which allows their benchmarks to be more easily understood by investors. In addition, the simple construction mitigates many of the most concerning biases that can affect these types of indexes such as backfill and overfitting biases. The simple, straightforward rules that determine the contents of the MLM Global Index represent the core risk/return drivers of many STF strategies, and its performance and tracking ability is fairly comparable to those of several more complex benchmarks. These features can make this offering a compelling option for clients seeking a simple and reliable benchmark. It approximates the return pattern of the STF space relatively well, can be expected to deliver a low correlation to global growth assets like equities and corporate bonds, and is both liquid and investible.

However, this index's simplicity and consistency does come with some costs. First, both this offering and MLM's other indexes lack a specific portfolio-level volatility target: although the portfolio's asset class distribution is based on each asset class' historical volatilities, the index's overall exposure levels are weighted based on percent of notional exposure as opposed to an explicitly targeted volatility. This construction methodology will cause the benchmark's level of underlying volatility to fluctuate across different market environments (as seen in the table of standard deviations, page three) since notional exposure is held constant regardless of changing volatility in various underlying futures markets. This could, in turn, increase the benchmark's tracking error vs. managers who target (manage) the volatility of their STF strategies more closely.

Secondly, this index also uses two lookback windows. This practice is not consistent with most managers in the space, who typically target numerous lookback period trading signals and may aggressively vary the risk capital allocated to each lookback window based on the strength of its underlying trends. However, the MLM Global Index's average lookback profile is relatively consistent with the intermediate-term average footprint of most managers in its space, but can be expected to diverge from active managers' positioning during periods where trend patterns cause them to tilt noticeably long-term or short-term. More complex and dynamic benchmarks are more likely to track performance of actively managed systematic trend following strategies, though they may also open themselves up to the biases discussed earlier.

The MLM Global Index is investible, at low cost and customized leverage, from Mount Lucas Asset Management.

MLM Global 15V Index Markets Traded

Commodities	Currencies
Crude Oil	Australian Dollar
Heating Oil	British Pound
Natural Gas	Canadian Dollar
Unleaded Gas	Euro
Corn	Japanese Yen
Soybeans	Swiss Franc
Wheat	
Copper	
Gold	
Live Cattle	
Sugar	
Global Fixed Income	**Equities**
Canadian Gov't Bond	S&P 500
Euro Bund	Nikkei
Japanese Gov't Bond	Euro Stoxx
Long Gilt	CAC 40
U.S. 10-Year Note	FTSE
	DAX

The Credit Suisse Managed Futures Liquid Index: We feel that the Credit Suisse (CS) index strikes a strong balance between straightforward construction and sophistication. A series of clear, well-defined portfolio construction rules helps to shelter the index from selection bias and style drift, while the volatility targeting employed at all levels of the index's construction mirrors the portfolio construction approach currently being pursued by a large number of STF strategies, and favored by many sophisticated investors. The index's negative long-term correlation with equity markets also leads us to view it as an able and appropriate proxy for diversification-oriented STF investments. Furthermore, the index has the advantage of repositioning based on daily signal recalculation, which allows it a level of adaptability to market changes similar to that enjoyed by active STF strategies. The more rigorous level of comparison that results from this benchmark's relative sophistication is in some respects evident through its historical performance vs. our other benchmark candidates in the "Growth of $1" chart on page three, where this benchmark achieved a higher level of long-term return than many of its counterparts while maintaining a more advantageous risk/return trade-off.

In terms of representativeness, we feel that the volatility targeting at the heart of this index's construction brings this benchmark more closely into alignment with the typical goals of clients than many of its peer indexes. Targeted volatility is a widespread practice across both active managers and investors, pursued with the understanding that portfolios must reposition constantly in response to changing markets in order to deliver reasonably consistent levels of risk and consistent diversification benefits. Given the importance of volatility in portfolio construction, we favor this approach vs. simple, exposure-based investing, and we expect the active managers that comprise most client portfolios to frequently pursue it.

Another feature that distinguishes the CS index is its commodities allocation, which it accesses through several Bloomberg Commodity sub-indexes (formerly DJUBS). The practice of using of sub-indexes for its commodity exposure rather than individual commodity futures contracts allows the index to maintain broad commodity sector diversification at all times. The CS index's commodities exposure is composed of four commodity sub-indices: agriculture, energy, precious metals and industrial metals. The composition of the CS index is shown as follows grouped by color:

CS Managed Futures Liquid Index Markets Traded

Commodities	Currencies
Soybeans	Australian Dollar
Soybean Oil	British Pound
Corn	Canadian Dollar
Wheat	Euro
Coffee	Japanese Yen
Cotton	
Sugar	
Crude Oil	
Heating Oil	
Natural Gas	
Unleaded Gasoline	
Gold	
Silver	
Copper	
Aluminum	
Nickel	
Zinc	
Global Fixed Income	**Equities**
Euro Bund	S&P 500
Japanese Gov't Bond	Nikkei
10-Year Gilt	Euro Stoxx
U.S. 10-Year Note	Hang Seng
	FTSE

This type of allocation should help maintain a broad-based exposure to trends in commodity futures, which we feel is likely to be more representative of a diversified portfolio of STF strategies than the narrower lineup of commodity positions used by many other benchmarks.

Furthermore, the CS index also incorporates a wider range of lookback windows than many other indexes, which gives it a more intermediate-term average lookback profile than most of its peers. For example, while the MLM Global (15V) index has two trailing lookback periods, the CS index runs 16 different lookback windows, resulting in an average lookback period of just five months. Given this difference in profile, the CS index construction can generally be expected to react more quickly as markets change. This more complex profile also often brings the CS index into closer alignment with many active managers, who typically run a diverse range of lookback windows and so often end up with profiles closer to that of the CS index than to those of its less complex counterparts.

The main disadvantage of the CS index is its limited "live" history. This benchmark was incepted in February of 2011, and its earlier performance calculation is dependent on back-test simulations. Less live history risks "overfitting" to more recent history, perhaps leading to a less robust measure than that of a longer-running counterpart. Nevertheless, benchmarks are not required to have been invested, only that they are investible at scale. The live history of actual investment experience indicates that the strategy is indeed investible, thus this should not be an impediment to the utilization of this benchmark for historical modeling and evaluation purposes.

Finally, this benchmark is investible at low cost and at a range of target volatilities, from Credit Suisse Asset Management.

The SG Trend Index: This peer index has the advantage of actively managed constituents, reflecting not only the results of simple trend-based algorithms but also of sophisticated risk management and the constant evolution of its constituents' underlying strategies in response to changing markets. Because of this, it can be argued that this benchmark's composition of live, active funds holds managers to a higher standard of comparison than its simpler, rule-based counterparts.

However, this added dimension of actively managed underlying components comes at the cost of being uninvestable and subject to the volatility that the underlying managers collectively decide to run. Furthermore, there is no overall portfolio construction or risk management performed on the resulting "index", which likely results in risk concentrations at times.

Unlike the Credit Suisse and MLM indexes, it is not possible to directly invest in the SG Trend Index in a straightforward way. The closest a client can come to replicating this benchmark is a series of 10 separate investments in the benchmark's underlying constituents, which would have to be constantly rebalanced to maintain equivalent exposure. Given the fees and transaction costs that an investor would incur with that approach, as well as the distortions they would likely experience due to lagged exposure as they rotated across funds to match the benchmark's annual rebalancing, we cannot truly call this benchmark investable.

Even if the provider of the index created an investible alternative that mitigated these issues, the historical track record of the index is based upon many managers that are no longer accepting capital. Though managers are rotated out of the index at the point when they stop accepting new capital, their past performance remains incorporated into the benchmark's historical returns. This creates potential distortions in exposures and performance across time periods as well as between the past performance of the benchmark and the likely future performance of its current lineup of investable underlying managers. While the SG Trend index is a reasonable peer index of large STF managers, it does not meet the criteria of a good benchmark. It is not replicable, it is not specified in advance, and it is not low cost.

Furthermore, the leeway wielded by this benchmark's underlying constituent managers in adjusting their strategies also makes this benchmark much more ambiguous than many alternatives – the index's 10 underlying managers might hold very different asset concentrations and market factor exposures from one day to the next, and these underlying exposures are not always publicly reported. This would make it impossible for any heavily benchmark-constrained active strategies to properly adjust their positioning in order to remain within specific index-related exposure boundaries.

Lastly, like the MLM Global index, the SG Trend index does not target a specific level of volatility, which can pose difficulties as a comparison tool for active strategies that operate under a targeted volatility mandate.

***Summary**: the following table assesses the benchmark alternatives in a comparative manner.*

	CS 15% Volatility	MLM Global (15V)	SG Trend
Measurable	+	+	+
Specified in Advance	+	+	+
Unambiguous	+	+	-
Representative	+	+	+
Replicable	+	+	-
Investable	+	+	-
Other Benefits	Volatility Targeted	Simple, Robust	Includes Active Management
Main Issues	Short Live History	Lacks Live Track Record	Not Fully Investable
		Not Volatility Targeted	Not Volatility Targeted
			Low Volatility (≈10%) vs. Equities

Recommended Uses: Given their status as investable tools, the CS and MLM benchmarks provide two useful "minimum alternatives." If an active strategy cannot add value above and beyond these relatively simple and inexpensive options over the long-term, then investors would be better served by reallocating that strategy's capital to one or both of these index exposures directly, which can be quickly and cheaply done through their respective index implementations. Given this, we recommend that any long-term STF exposure be periodically evaluated against one or both of these benchmarks. Of the two, we favor the CS index, given its signals based on multiple lookback horizons (16 different signal periods, versus two for the MLM indexes), its intermediate term average lookback horizon (similar to that of most active strategies), its live history of implementation in its current form, and its volatility targeting, which we feel is an important and effective part of portfolio construction in liquid trading strategies such as systematic trend following. That said, comfort with the simplicity and long tenure of the MLM approach may make it a better choice in some cases.

The active manager composition of the SG Trend index makes it a useful supplemental tool when comparing any given actively managed STF strategy to the "full package" of active management functions, as it will likely include any added value that active management of average quality might deliver above and beyond a simple rules-based approach. However, because it is not directly investable, it does not currently represent a viable investment alternative, in contrast to the CS and MLM benchmarks. It is also more vulnerable to the survivorship and reporting biases that have the potential to affect any index composed of live underlying managers. As such, we recommend that it not stand alone as the only benchmark of choice for any given STF strategy.

Conclusions: Although alternative investments present a number of benchmarking challenges, the liquid nature of the STF space has allowed several high-quality benchmarking options to emerge. We feel that these benchmarks have the potential to be extremely useful in helping investors to evaluate the performance of active STF strategies, provided that their construction and limitations are properly understood. We feel that each of the three benchmarks outlined in this piece represent solid, high-quality options and recommend that the choice of benchmark be made after an honest reflection on the needs of the institutional investor.

Product	Bloomberg Ticker	Contact Information
CS Managed Futures Liquid Index, 15% Volatility	CSLABT15	Christian Hoffman cs.alts@credit-suisse.com +1 212 538 8616 www.credit-suisse.com/lab
Mt Lucas MLM Global Index™ (15V)	MLMCGITR	clientservice@mtlucas.com 267 759 3500 www.mtlucas.com
SG Trend Index	NEIXCTAT	Societe Generale SG Prime Services PRM.Indices@sgcib.com +44 (0)20 7676 8225

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