SWAN GLOBAL INVESTMENTS

Making Sense of Risk Metrics

Risk Metrics for Alternative Funds: Introducing the StatMAP

Marc Odo, CFA®, CAIA®, CIPM®, CFP® | March 29, 2018 | Swan Blog

When it comes to analyzing the risks and returns of mutual funds, ETFs, SMAs, and hedge funds, financial analysts have an overwhelming number of performance metrics available. If one were to pop open Morningstar Direct, Zephyr StyleADVISOR, or eVestment Analytics, there is a deluge of ratios and statistics available. Sortino ratio, Value-at-Risk, tracking error, kurtosis—who can keep them all straight? What do these metrics tell us? How are they useful?

In a previous role as Director of Research at Zephyr Associates, I developed a framework to organize all the different metrics, so it could be easier for people to understand and keep track of what each metric measures. The framework has two axes: categories of measurement and classifications of risk.

Categories of Measurement

The vast majority of the performance metrics available can be classified in one of three ways:

1. Measures of return
2. Measures of risk
3. Measures of return-vs-risk trade-off

Generally speaking, the higher or larger the measures of return, the better. Conversely, one hopes the values of the various risk measures to be as small as possible. Finally, since return-vs-risk measures are typically expressed as ratios with return in the numerator and risk in the denominator, one would like to see the trade-off ratios like Sharpe ratio and information ratio to be as large as possible.

Looking at Risk Holistically

The other axis brings in the many ways we understand risk. While volatility risk is the more familiar one, focusing on one aspect risk while ignoring others leaves blind spots in our understanding of it. To provide a holistic view, I propose four broad classifications:

1. Risk in terms of volatility
2. Risk relative to a benchmark
3. Risk in terms of capital preservation
4. Risk of rare but extreme events, known as tail risk

Volatility

This framework reflects the evolution in thinking over the last 50-60 years. When Harry Markowitz and his contemporaries developed the ground-breaking Modern Portfolio Theory, risk was most often described in terms of volatility. Because investment returns were often described using long-term averages, volatility was used as a cross-check on the validity of those long-term averages. Volatility was the original measure of risk, and it continues to this day as Standard Deviation and Sharpe Ratio are two of the more widespread metrics used to measure and compare funds.

Benchmark-relative Risk

The metrics that fall under benchmark risk are calculated relative to a standard measuring stick to highlight value and performance. During the 1980s and 1990s, the most popular performance metrics were measures like alpha, beta, information ratio, and capture ratios, all which fall under benchmark-relative risk. Why were they so popular during this time? I believe this was for two reasons.

First of all, equity markets enjoyed a remarkable bull run between 1982 and 2000. With the market performing so well, so did everyone else. Second, during this era, passive investing established itself as a viable approach. Vanguard and then later the ETF providers promised to match market returns very affordably rather than potentially outperform at a hefty price. With the bull market and passive investing as a backdrop, it is no wonder that benchmark-driven metrics became popular. If one was an active manager, one had to "prove" added value over a passive option, and metrics like alpha and information ratio are designed to do just that.

The shortcomings of benchmark-relative metrics were exposed during the first decade of the new millennium. In the span of less than ten years, we experienced the two worst bear markets since World War II. During the dot-com bust of 2000-02, markets lost almost 45%, and during the Financial Crisis of 2007-09, markets fell over 50%. In this environment, it was entirely possible that a manager outperformed its benchmark and posted respectable alphas and information ratio but still lost 40% of its value.

Capital Preservation Risk

When most investors think of risk, simply "not losing money" is the most likely definition. Looking to metrics that can measure this is crucial for those who care more about preserving their wealth that outperforming a benchmark. The idea of maximizing the excess return-vs-tracking error relationship takes a backseat to not losing 30%, 40%, or 50% of your wealth. Ways of quantifying risk in terms of capital preservation represent the next generation in risk and performance measurement. Two of which, Pain Index and Pain Ratio, we have already discussed on this blog.

Tail risk

Closely related to capital preservation is the risk of extreme, outlier events. Commonly known as "tail risk" or "black swan" events, they are marked by their rarity and severity. Despite their "rarity," it is important to measure how funds do during these extreme events, so investors can be better prepared for when the event may happen. Furthermore, minimizing the impact of these types of events may help avoid the life-altering financial losses that can occur. The scope and scale of the Financial Crisis of 2007-09 had not been seen since the Great Depression, and who can really say what the future will bring. While quantifying tail risk is difficult, there have been some innovations on this front.

The StatMAP Framework

When we combine these concepts along two axes, we get what at Zephyr we called "the StatMAP." Most of the performance and risk metrics fall neatly into this grid.

	Volatility Risk	Benchmark Risk	Capital Preservation Risk	Tail Risk
Return		Excess Return Batting Average Up Capture		Skewness Upside Omega
Risk	Standard Deviation Downside Deviation	Beta R-squared Tracking Error Down Capture	Maximum Drawdown Pain Index	Kurtosis Value at Risk Conditional Value at Risk Downside Omega
Return/Risk Trade-off	Sharpe Ratio Sortino Ratio Zephyr K-ratio	Alpha Information Ratio Treynor Ratio	Calmar Ratio Pain Ratio	Omega

Source: Swan Global Investments

There are certainly more performance metrics out there, but most of them would fit somewhere within this framework.

With this framework, it should be easier for individuals to pick the metric that best suits what they want to specifically measure and compare when looking at different funds' performances.

While certain metrics like beta are well established and well understood, many of the newer, higher-level statistics could use a bit of explanation. This is especially true of the newer, post-MPT statistics in the "Capital Preservation" and "Tail Risk" columns that are more useful for analyzing hedge funds and liquid alternatives. We have already discussed Pain Index and Pain Ratio, two favorites here at Swan Global Investments. With a focus on measuring alternative investments, some metrics we will discuss in this series are Omega and Zephyr K-Ratio.

About the Author:

Marc Odo, CFA®, CAIA®, CIPM®, CFP®, Director of Investor Solutions, is responsible for helping clients and prospects gain a detailed understanding of Swan's Defined Risk Strategy, including how it fits into an overall investment strategy. Formerly, Marc was the Director of Research for 11 years at Zephyr Associates.

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