

UNDERSTANDING VOLATILITY

OR WHY YOUR PORTFOLIO PRODUCES AT BEST MEDIOCRE RETURNS©

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Volatility and the Normal Distribution

Standard deviation (σ) measures volatility or the dispersion of random values around the mean of a variable such as a portfolio or individual stock prices, but does not measure the direction of a trend.

What has become the bedrock of finance is an out-of-date almost universally accepted finance theory, which uses the statistical normal distribution (the Gaussian bell curve) as the measure of risk per se. In reality stocks are found not to be normally distributed but in gross measure leptokurtic and skewed. As a consequence, price changes do not behave as expected, so that standard deviation can be a very misleading proxy for risk as the following example shows.

DEFINITION of
'Leptokurtic': A statistical distribution where the points along the X-axis are clustered, resulting in a higher peak (higher kurtosis) than the curvature found in a normal distribution

Two traders with similar standard deviations may show entirely different distributions of return! This is because the volatility attributes of stock prices are not uniformly linear, contrary to that assumed by conventionally accepted financial theory. Therefore one portfolio's volatility profile may look like the familiar normal distribution; but the other will be shown to have a much greater degree of kurtosis and skewness.

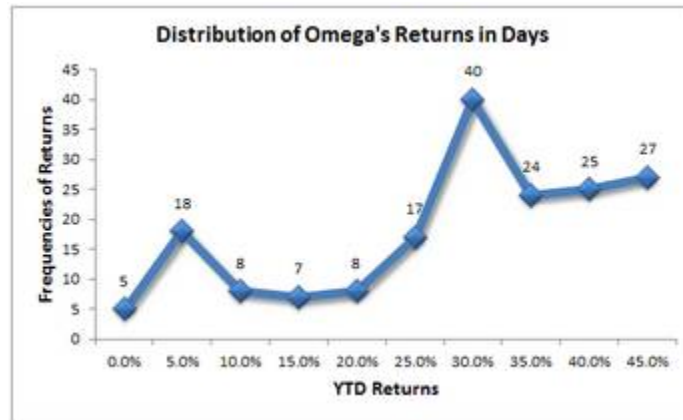
This false premise of linearity degrades the industry's range of standard risk metrics, not just of standard deviation, but also of beta, the capital asset pricing model, the Sharpe ratio and R-Squared, all based on the perfectly formed theoretical bell curve. This is because asymmetric price distributions affect the outcomes of risk metrics.

The consequence of these misinterpretations is that they have led to sub-optimal strategies such as index investing in the mistaken hypothesis that they are less risky by offering little more than the market risk premium. However, in times of low-return markets as we currently experiencing losses quickly mount up compared to those strategies which seek profit maximization.

The Significance of Skewness

In probability theory and statistics, skewness also measures the asymmetry of a distribution. The skewness of a portfolio may be either positive or negative. Positive skew means that there is a higher probability of a significant return. This is because it measures the direction of surprises and resulting trends that create gains or losses in addition to the market risk premium. Outliers, or extremes in performance, not associated with normal distributions, will clearly demonstrate skewness. The crash of 1987, which was the largest one-day stock market crash in history, was such an extreme outlier. On the other hand, a positive outlier will stretch the right hand tail of a distribution.

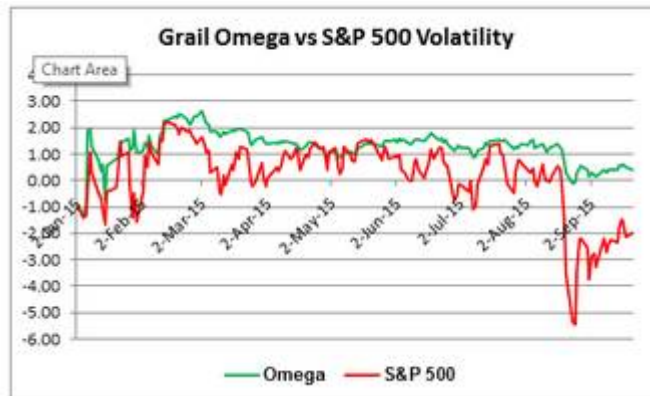
The following chart per 21 September shows the asymmetric distribution of the Omega Portfolio, which was set up on 31 December 2014 and has the shape of a double leptokurtic distribution at the 5% and 30% points with a positive skew of 33% and a negative one of 67%.



Volatility and Value-at-Risk

Using standard deviation, Value-at-Risk attempts to quantify how much loss a portfolio may suffer with a given probability. This metric calculates semi-standard deviations to separate upside from downside volatility. As such VaR is not just the measure of the risk of loss, i.e. short volatility, but also of the 'risk' of gain, i.e. long volatility.

This chart tracks on a daily basis the volatility of the Grail Omega Portfolio and the S&P 500 from the beginning of the year, and shows that the highest risks are certainly with the index:

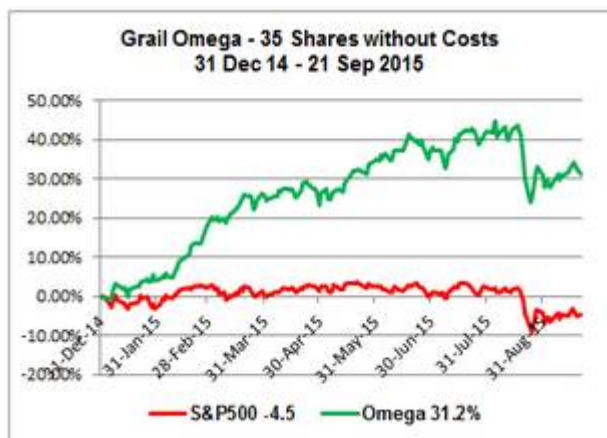


The Alpha Premium

If a share price is generating an abnormal return, it is likely because the company is reporting strong and consistent revenue and EPS growth, as well as other positive financials. Such a company-specific result, which exceeds the market return, is called the Alpha premium.

This premium has for example the propensity to raise a stock's beta value during bullish market conditions and to reduce it in bearish environments, and is caused by a stock's asymmetric price distribution, described above, and not the bell curve of standard financial theory. Additionally, portfolio diversification processes are unlikely to fully dilute the Alpha premium to a mere near-market return, especially when a portfolio holds a concentration of similarly endowed stocks, such as the Grail Portfolio, which is generating these very strong abnormal returns:

DEFINITION of 'Alpha':
That portion of an abnormal return in portfolios and stocks in excess of the market risk premium



Alphas only infrequently influence directly the market return. Usually they originate from large-cap bellwether stocks like Apple (AAPL) when they make major announcements.

The absence of above-average Alphas in funds and portfolios is a greatly missed opportunity, because they unnecessarily harbour higher risks and lower returns.

The Market Return

For reasons of consistency, fund managers are primarily focused on benchmarking their performance to a broad market index and ignore attempts at profit maximization. This is because of the mistaken belief that portfolio diversification diminishes approximately two thirds of all specific stock risks, leaving only the market return as the basis of reward. Thus the removal of these risks explains why index funds dominate all other types of equity investing, but not the rationale for over-diluting the Alpha element. As a consequence, the pursuit of merely achieving the market return for consistency's sake requires the construction of portfolios with low Alphas, which by default require the selection of stocks with mediocre growth prospects. This convention is reinforced by the obsolete theory that you cannot beat the market all of the time; a hypothesis which attempts to justify index-linked investing, but in the face of its self-fulfilling prophesy is an approach that absolute return investors categorically reject, and correctly so!

One reason for nurturing these old beliefs of the 1970s is the upfront management fee structure, which acts as a disincentive for change from a market return approach to an absolute return oriented fee structure.

Volatility's Payoffs in the three phases of a trading cycle

The following extracts from the Omega portfolio show the influence of investor sentiment under three different market conditions. The first example is the overall result, made up of the other three phases.

Note that in example 3 sigma declined by -34% but the portfolio still delivered a strong return of 18%.

1. The complete trading cycle, this covers the bullish, range-bound and bearish phases.

Period	Sigma σ	Price	Profit
2-Jan-15	-1.00	1438.64	
21 Sep 15	0.39	1825.74	
Long Volatility	1.39	437.99	31.6%

2. Bullish behaviour generates higher volatility and higher accumulation.

Period	Sigma σ	Price	Profit
2-Jan-15	-1.00	1438.64	
29-May-15	1.47	1932.79	
Long Volatility	2.47	494.15	34.3%

3. Range-bound behaviour is usually accompanied by declining volatility and either increasing or decreasing accumulation or distribution. Here it is increasing distribution.

Period	Sigma σ	Price	Profit
6-Feb-15	1.19	1516.64	
6-May-15	0.85	1799.23	
Short Volatility	-0.34	282.59	18.6%

4. Bearish behaviour causes declining volatility with a corresponding loss in the portfolio's value.

Period	Sigma	Price	Profit
20-Jul-15	1.49	2038.50	
11-Sep-15	0.33	1870.87	
Short Volatility	-1.16	-167.63	-8.2%

The Low Volatility Anomaly

Professor Malcom Baker of Harvard University and Messrs. Bradley and Wurgler, wrote in 2010 a seminal paper entitled BENCHMARKS AS LIMITS TO ARBITRAGE: UNDERSTANDING THE LOW VOLATILITY ANOMALY. Their research paper covered 41 years of data and provided conclusive evidence that portfolios of low volatility are able to generate high returns and not what is conventionally accepted as requiring higher volatility, and thus risk. In spite of this irrefutable evidence, the finance world nevertheless still stubbornly holds on to the out-of-date concept of the normal distribution as the basis for calculating risk metrics.

This inability to change continues to generate an ever increasing plethora of Index Funds, EFTs and portfolios with only the minimal addition of Alpha, just sufficient to marginally outperform the Market Risk Premium of a broad index.

The Low Risk Anomaly means that high returns can be achieved with equal or even less risk than the S&P 500; an observation rejected by standard finance theory. Grail research confirmed that Betas are asymmetric by showing in these calculations that down- and upside Betas have different values and are not the uniform values forecasted by normal distribution theory.

Sketchers Inc	SKX Symmetric Beta				SKX Asymmetric Beta			
	Negative Beta	1.04	Positive Beta	1.04	Negative Beta	0.94	Positive Beta	(0.55)
Cambrex Corp	CBM Symmetric Beta				CBM Asymmetric Beta			
	Negative Beta	2.38	Positive Beta	2.38	Negative Beta	1.40	Positive Beta	0.44
Ebix Inc	EBIX Symmetric Beta				EBIX Asymmetric Beta			
	Negative Beta	2.38	Positive Beta	2.38	Negative Beta	0.52	Positive Beta	0.12

Behavioural Economics provides the explanation

Behavioural economics proves why the bell curve of a normal distribution is incorrect. It is because it rejects the theoretical concept of a wholly abstract rational homo economicus in terms of computational capacity and memory used in decision-making, but now accepted as being economically unrealistic.

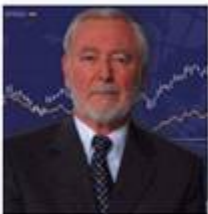
Instead, even the most rational of us are constrained by our own personal experiences, or bounded realities. These mental shortcuts, or heuristics, help us to operate intuitively, especially under severe time constraints and limited information. Thus a group-think response is invariably created by equity traders reading the same breaking news. In this sense, when prolonged, this concerted group behaviour, whether human or computerized, tends to shift the market in a given asymmetric direction, giving rise to different mean, median and mode values, as well as creating leptokurtic or platykurtic distributions. These dimensions are of course in a constant state of flux, dependent on the flow and ebb of investor sentiment.

Definition of
'Heuristics': Any 'rules of thumb' or simple rules of behaviour, by which problems are solved within the limits a person's bounded reality

We all tend to overestimate our skills and knowledge as well as under-estimating the impact of uncertainty. We view the world from within the boundaries of our comfort zones, hardly daring to risk expanding our actions to gain a greater insight into the problems that face us. At the edge of our self-created reality is the Platonic Fold, where the gap between what we know and what we think we know creates regular crises by calling into question the very heuristics and biases we use to solve our day-to-day problems. By avoiding such confrontations, we risk the greatest risk of all: by opting for the safe decision we deny ourselves the opportunity of challenging new experiences, gaining new knowledge and thereby reaping the prospect of achievement and growth, not to mention gaining a strong and sustainable advantage vis-à-vis complacent, change-resistant competitors.

At any rate, the current view of volatility remains deeply-rooted, invalid through its approximation of reality, in spite of the visionary words of The Low Volatility co-authors:

"We believe the long-term outperformance of low risk portfolios is perhaps the greatest anomaly in finance. It is large in economic magnitude and practical relevance and challenges the basic notion of a risk-return trade off."



WISDOM TO LIVE BY

Smith on Insight

The calculated risk is manna to the spirited mind
as the average is to the unenlightened.

John Henry Smith

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