Bricks, shares or gold bars?

The Omega Measure: A better approach to measure investment efficacy

MOUNTAIN VIEW, Calif. (26 Nov. 2014) – Propertini research has demonstrated that risk averse investors had better returns on their capital when they invested in property.

- Propertini's research shows that for risk-averse investors, property gives the best returns, outperforming hedge funds.

- Investors who can take more risk do better with gold or equities – but could see a greater downside.

Estate agents often tell us that a house is "a great investment", and undoubtedly it's the single biggest investment most of us will ever make.

Other commentators warn that the property market looks dangerously exposed and warn investors to keep their money in the bank – not in bricks and mortar.

Vice President at Propertini, Aled Davies, observes that "residential real estate is not being assessed like fund managers on how well the investment or the asset class performs."

Traditionally house prices are reported in terms of only price gains or loss without ever factoring in the associated risk. Davies from Propertini says that "investors really should know the risk profile of any investment they make."

So what's the truth? Davies explains "Propertini's research suggests that property is, in fact, an investment that combines a relatively stable return with low risk."

Propertini set out to see just how well residential property performs against other asset classes. Rather than using a simple price appreciation model, Propertini used a more sophisticated risk-return formula called the Omega Ratio – generally used to rank the performance of hedge funds - to analyse how well residential property performs for given levels of risk. Davies says "in other words, we need to know if home buyers get more price

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rise for less risk than investing elsewhere, or are they running more risk to get less growth?"

Co-author of the original mathematical derivation and publication of the Omega Measure, Con Keating, is pleased to see this research applied to examine residential real estate as an asset class. "It is really very stimulating to see Omega functions brought to bear, as measures of investment efficiency, on the real estate sector."

Propertini ranked several bond indices, the FTSE stock exchange index, gold, and hedge fund indices against residential property, blending the national house price index with two sets of rental yield statistics to capture the total return performance. It looked at the long run, comparing ten years of historical data.

For investors looking to make a stable low return, residential property delivers these returns at low risk, giving it a high Omega. It ties with long gilts for capital preservation, and for investors looking to make low positive returns, is the best investment, narrowly ahead of gold.

However, investors who are able to take more risk and target a higher rate of return look set to do better by picking either equities or gold. Despite recent experience of rocketing house prices in London, over the long term, and across the country, residential property appears to be a steadier investment prospect rather than a get-rich-quick asset class.

It is surprising that the index of hedge funds, often marketed as delivering higher rewards at lower risk, didn't perform particularly well in Propertini's analysis. Investors wanting to protect their portfolios over the long term might do better with a mix of residential properties and long gilts, rather than paying over the odds in hedge fund management fees.

Keating explains that "one of the advantages of the Omega function is that it is particularly well suited to price sequences which do not follow the normality of standard asset price theory. This makes it particularly well-suited, and therefore reliable, for the comparison of asset classes with widely varying characteristics."

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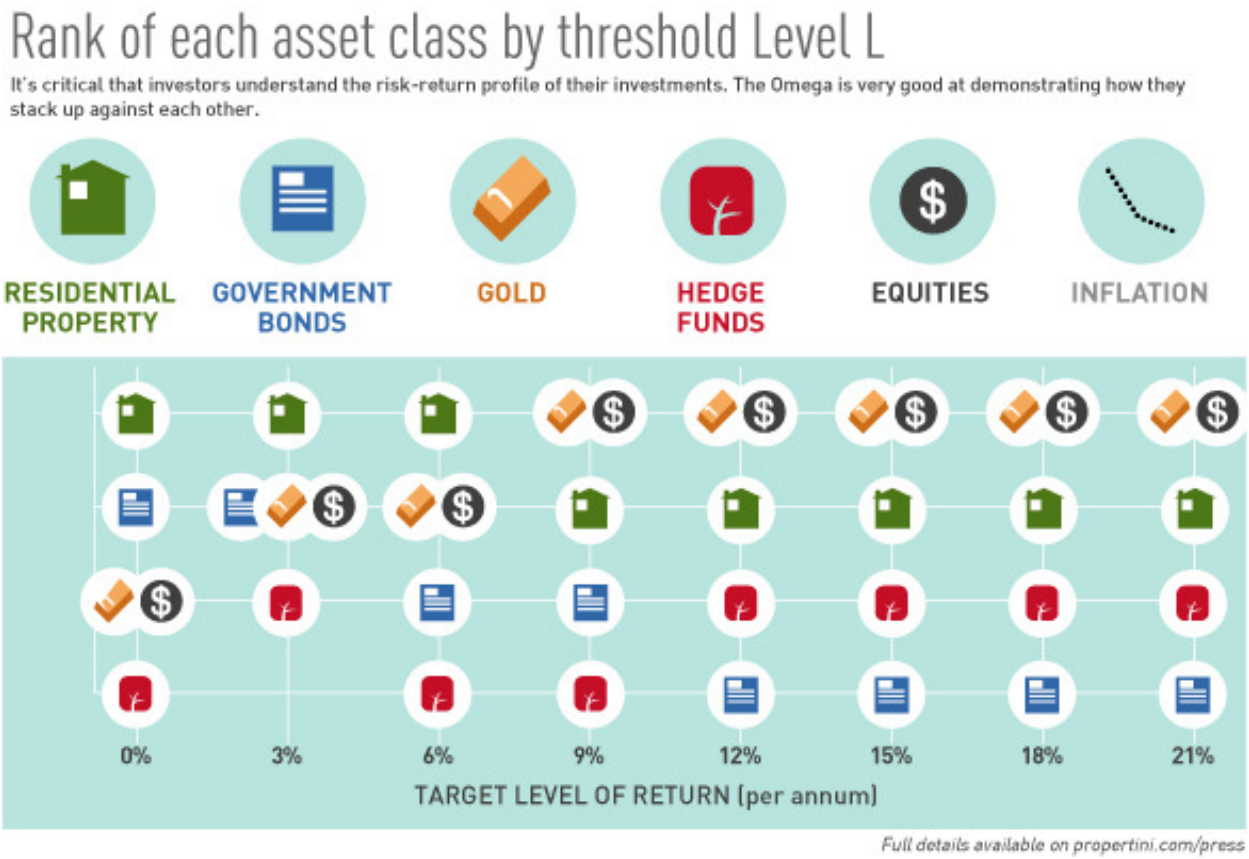
Omega Ratios of investments



Monthly Threshold	Annualised Threshold	Residential Property	Hedge Funds	Gold	Inflation	Gilts	Equities
0.00%	0.00%	3.75	1.28	1.74	4.44	2.20	1.52
0.25%	3.04%	2.25	0.99	1.54	1.09	1.47	1.32
0.50%	6.17%	1.36	0.77	1.37	0.18	0.99	1.14
0.75%	9.38%	0.82	0.60	1.21	0.02	0.66	0.99
1.00%	12.68%	0.50	0.47	1.08	0.00	0.45	0.85
1.25%	16.08%	0.30	0.37	0.96	0.00	0.30	0.73
1.50%	19.56%	0.30	0.37	0.96	0.00	0.30	0.73
1.75%	23.14%	0.30	0.37	0.96	0.00	0.30	0.73
2.00%	26.82%	0.09	0.18	0.68	0.00	0.10	0.46
2.25%	30.60%	0.06	0.15	0.60	0.00	0.07	0.39
2.50%	34.49%	0.05	0.12	0.54	0.00	0.05	0.33
2.75%	38.48%	0.04	0.09	0.48	0.00	0.03	0.29
3.00%	42.58%	0.03	0.07	0.42	0.00	0.02	0.24

All measurements are Total Return

The calculation sheet as well as easy to graph functions are available on propertini.com/press

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How it works

Investors are interested in two things – the rate of return a fund manager makes, and the risks he or she runs in order to get that return. Often funds are analysed using the Sharpe Ratio, which compares an investment's excess return over the risk-free rate (e.g. what you might could get by investing in ten year gilts) with the standard deviation of the portfolio returns (a measure of how much the returns from individual stocks in that portfolio vary from the average). A manager who achieves good returns but with a scattergun approach – some very high performing stocks and some that lose a great deal of money – would have a lower (worse) Sharpe Ratio than one who achieves the same returns with stocks whose returns were less divergent.

However, the Sharpe Ratio, because it uses the standard deviation, assumes that returns are Normally Distributed. In other words, it assumes the returns would form a Bell Curve. This is usually not what is observed empirically where we see fat tails in the distribution. These fat tails indicate the occurrence of large downward corrections occur far more frequently than the Bell Curve would predict. The Omega Ratio is sophisticated enough to capture all of this information.

The Omega Ratio also allows investors to determine their preferred return threshold. For instance, some investors might want their investments to match the risk-free rate, as a minimum; others might simply want to ensure they don't lose their initial capital. The return threshold they choose may change the ranking of different asset classes – that is, their risk tolerance and return requirements will change the assets they should be investing in.

Propertini compared the capital performance of the different types of asset using mainly UK indices, to reflect the choices available to the UK investor.

Further technical details available on propertini.com/press or please contact info@propertini.com for additional details or insight.

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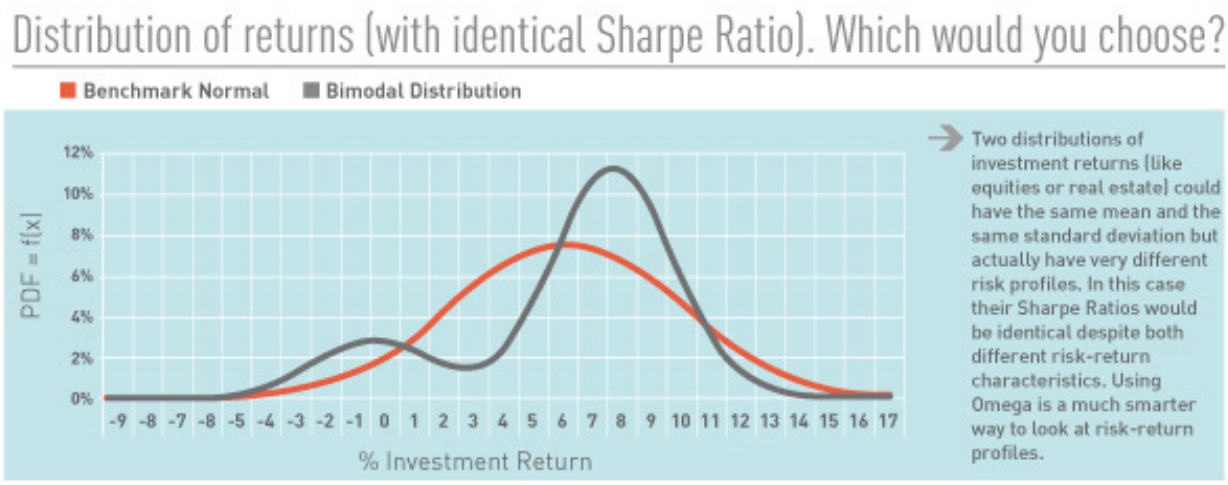
Notes for Editors

Background and technical notes on the Omega measure

Definition
Omega is a probability weighted ratio of gains over losses for a given level of expected return. This is a measure of the "quality of our investment 'bet' relative to the return threshold." (Keating & Shadwick).

Concept
According to Hicks & Marschak, investor preferences are a function of all of the moments of a return distribution. The Sharpe Ratio which uses only the first two moments (the mean and the standard deviation) ignores higher order moments (e.g. skewness). This is one reason why many consider the Sharpe Ratio of limited value.



All of the available information from the returns distribution, including higher moments, is encoded in the cumulative distribution. Keating & Shadwick developed the Omega measure to utilise all of the available moment information.

The calculation requires a choice of a specific level of return, L, which will be the threshold value. This threshold will be specific to each investor, and determined by their risk appetite. While one investor may be satisfied with any level of positive returns, another may regard gains of less than 5% as a loss. These investors would set L at 0% and 5% respectively.
Keating & Shadwick defined Omega to be the probability weighted ratio of gains over losses for a given level of expected return.

At a given level of return, using the very simple rule of preferring more to less, we should always prefer a portfolio with a higher value of Omega in comparison with one with a lower Omega. The portfolio with the higher Omega has a greater probability of delivering returns which match or exceed the L threshold.

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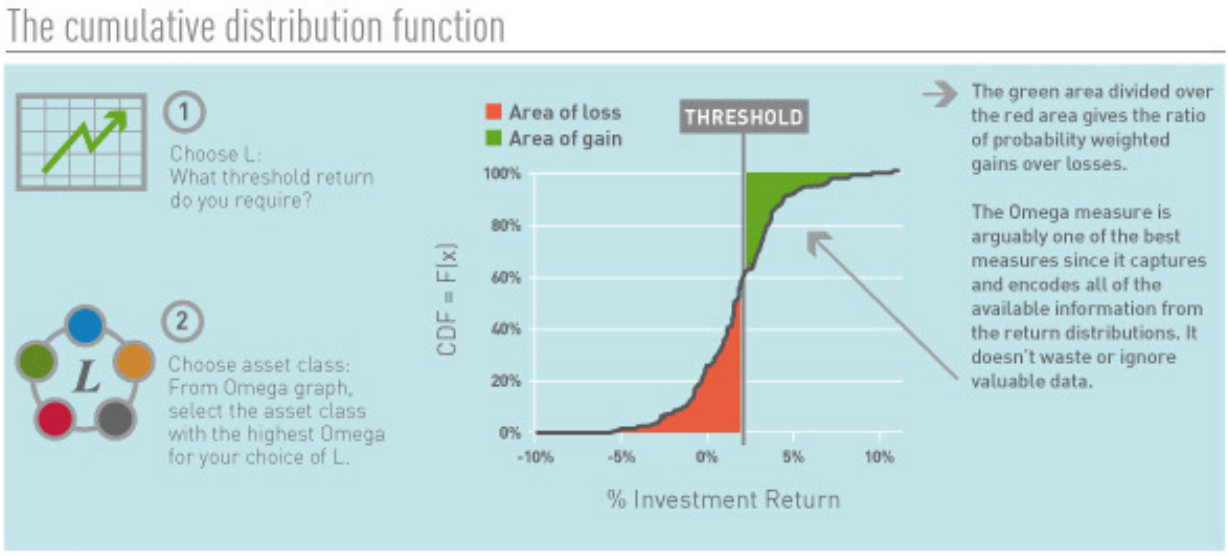
As paraphrased by Kazemi, Schneeweis and Gupta, the Omega measure as originally defined by Keating & Shadwick can be written as:

$$\Omega(L) := \frac{\int_L^b [1 - F(x)]dx}{\int_a^L F(x)dx}$$

Where x is the random one-period rate of return of an investment, F(y) = P{x≤y} is the cumulative distribution of the one-period return, L is a threshold selected by the investor, and (a,b) represent the upper and lower bounds of the return distribution respectively.

Illustration

The graph shows the cumulative distribution function of a set of returns with a threshold level L.



If the investor chooses a threshold level, L, which signifies the return which should be exceeded, then the Omega measure can help them choose an appropriate investment. By partitioning the CDF graph, we can see that the investor would want the area labelled by "Gains" to be maximized and the area marked "Losses" to be minimized. This shows why the Omega is defined as the probability weighted ratio of gains over losses for a given level of expected return. The Omega measure has two critical advantages over traditional measures:

i) By construction, it encodes all possible information about the risk/rewards from the empirical return distribution.

ii) The return threshold is set according to investor preference and situation. This thereby offers a tailored performance measure.

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Super technical aside
The Omega measure can be viewed in terms of a call option and a put option with strike L. This result is elegant and profound. This decomposition reflects how derivative markets search for implied value by taking the ratio of traded option contracts. For demonstration purposes, the spreadsheet adopts this beautiful approach.

Shortcomings of our research
The total return index of property returns includes a number of large assumptions which represent the best estimates we can make given limited data. The calculation assumes that total return is the sum of capital appreciation (as calculated by the ONS HPI of England and) and a rental yield (which is interpolated from the ONS Experimental Index of Private Housing Rental Prices and Private Rental Market Statistics from the Valuation Office Agency.) Both of these data sets are England-only statistics.

Whilst the year-on-year change in the simple average house price can be used as an estimate of house price inflation, it is not ideal. This is because movements in the simple average house price can be affected by changes in the proportions of different property types being sold. (Many index calculation agents such as ONS and Halifax now calculate mix-adjusted average house prices as a basis for estimating house price inflation.)

Bond, equity and hedge fund indices have a survivor bias where failed contributors fall out of the index. House price indices do not.

The time period chosen is to some extent arbitrary. Analysis over differing historical periods were made and were broadly consistent with the results provided.

The frequency of observation was chosen to be one month. This allowed a consistent methodology over all asset classes for which some only provided monthly prices.

Costs and transaction costs were not factored into the analysis, and differences in liquidity were not addressed.

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Useful references

A Universal Performance Measure – Keating & Shadwick
http://www.isda.org/c_and_a/pdf/GammaPub.pdf

Assessing CTA Quality with the Omega Performance Measure – Winton Capital Management
http://www.performance-measurement.org/Winton2003.pdf

Omega as a performance measure – Kazemi , Schneeweis, Gupta
https://ciber.fuqua.duke.edu/~charvey/Teaching/BA453_2006/Schneeweis_Omega_as_a.pdf

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