
references

1. Ajisejiri, W. S., Chughtai, A. A. and MacIntyre, C. R. (2018), A Risk Analysis Approach to Prioritizing Epidemics: Ebola Virus Disease in West Africa as a Case Study. *Risk Analysis*, 38: 429-441.
2. <https://hbr.org/2006/05/preparing-for-a-pandemic>
3. <https://www.cdc.gov/vhf/ebola/pdf/cost-ebola-multipage-infographic.pdf>
4. https://www.otia.info/docs/10.29.14EVDPlanningCrisisManagementGuideforUS_TravelMembersFINAL.pdf
5. <https://www.bitc.org.uk/print/resources-training/impact-stories/arcelormittal-ebola-private-sector-mobilisation-group-epsmg>
6. <https://corporate.arcelormittal.com/news-and-media/news/2016/april/18-04-2016>
7. <https://www.business.qld.gov.au/running-business/protecting-business/disaster-resilience/pandemic-risk-management>
8. https://www-cdn.oxfam.org/s3fs-public/file_attachments/ebola_and_the_private_sector_-_bolstering_the_response_and_west_african_economies.pdf
9. <https://www.who.int/csr/disease/swineflu/phase/en/>
10. <https://www.bitc.org.uk/print/resources-training/impact-stories/arcelormittal-ebola-private-sector-mobilisation-group-epsmg>
11. https://www.foreign.senate.gov/imo/media/doc/040716_Knight_Testimony.pdf

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risk – an alternative approach

by **Andrea Luzzi**

What is risk? Hard to say. Under Modern Portfolio Theory (MPT), pioneered by Harry Markowitz, risk is identified with volatility. Variance and correlation are the main statistical measures to assess the level of peril of a portfolio.

The European Securities and Markets Authority (ESMA) designed the risk framework for UCITS funds on those assumptions: Value at Risk, PRIIP (Package Retail and Insurance-based Investment Products) regulation and SRI (Summary Risk Indicator) in particular are all grounded on the principle that volatility is a synonym of risk. The new SRI is unhurriedly making a step up with the introduction of a Credit Risk Measure and a Cornish-Fisher expansion. It is undoubtedly a progress in the right direction.

When you manage a portfolio of hedge funds you realize that the traditional framework of modern portfolio theory is neither modern, as it likes to be called, nor satisfactory.

Volatility is symmetric: under certain conditions, the deviations from the mean not only measure the predictable size and likelihood of potential losses, but they may identify opportunities too. Upside volatility, especially in active management, is a blessed bounty that is hard to classify as pure risk.

As an example, suppose we may choose between two bets which are based on the results of one hundred flips of a coin: in the first bet, you can earn \$100 if you get one head, but then you lose \$1 if you get one tail. In a second bet, you earn \$10 for one head and lose \$10 if you get one tail.

It is obviously not wise to take the second bet. However, according to MPT and UCITS regulation, the first choice is 5 times riskier.

This counterintuitive result is not the only pitfall.

From an allocator's perspective, a fund with an annualized return of 10% and a volatility of 10% is certainly preferable to a fund that delivers the same Sharpe Ratio with half of the volatility. It allows the asset manager to put less cash at work for a similar result. Once again, volatility represents more of an opportunity than an additional threat.

If volatility is an inaccurate definition of risk, correlation is not any better. Symmetry is once again an annoying feature. Who does not want to be correlated to the stock markets during the bull rally of the first half of 2019? Hard to define that common trend as "risky". Downside correlation may give a better indication of the risk underneath, but it misleads analysts by scaling the co-movements with the product of volatilities.

As fund managers, we had to make a decision: should we stay with the orthodox doctrine, or should we go?

We found our own heresy developing a new risk measure: The Downside Capture Ratio. Like Columbus' egg, the idea is pretty straightforward. We abandoned descriptive statistical measures and we concentrated on the only information that we want to extract from data: "How much money do I lose if...?"

The only ex-ante question that really matters for asset allocation.

We implemented the following Bayesian measure:

$DCR = \frac{\sum R_a}{\sum R_i}$ where R_i is defined as the negative performance of an index and R_a is the performance of a certain asset at the same point in time.

The end result is the ratio of the index loss which is embedded in the asset performance. A negative outcome shows a tendency of the asset to make money when the index (benchmark) marks a loss.

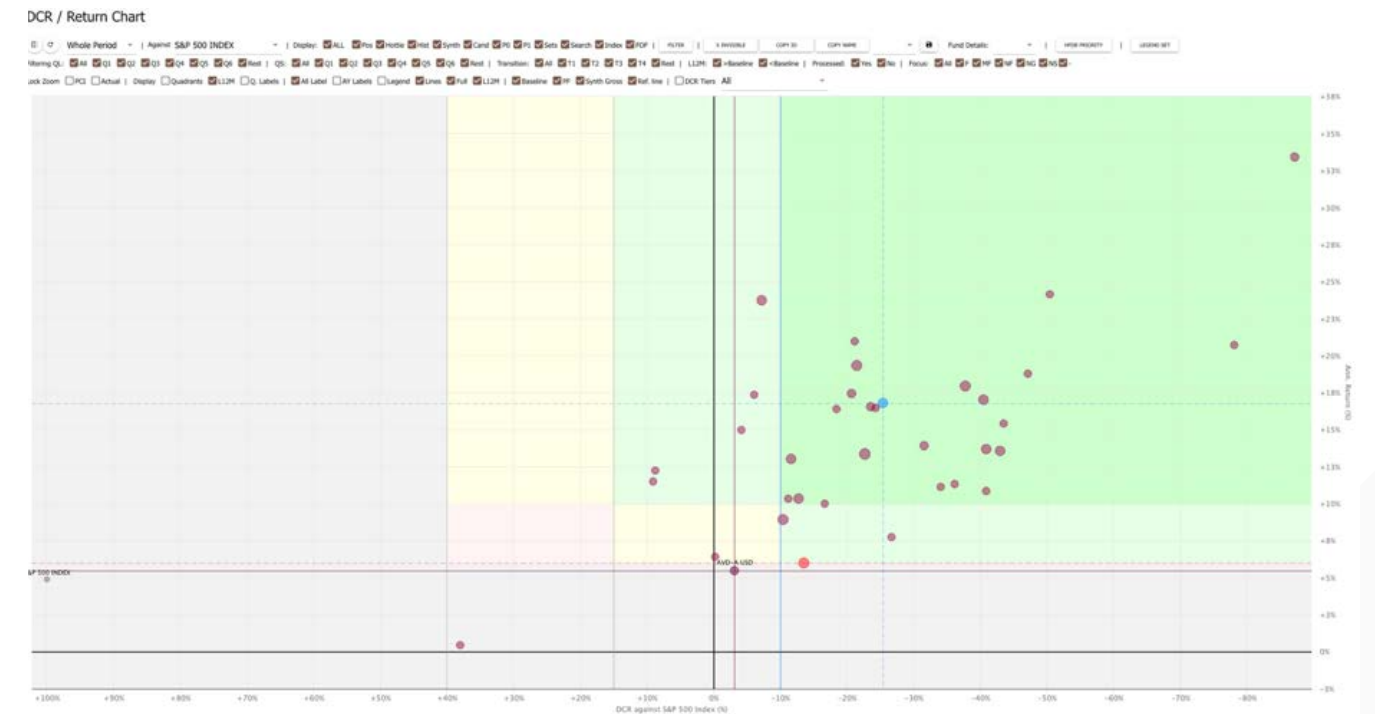
Once extended to a sufficiently large number of indices, the Downside Capture Ratio (DCR) identifies the sensitivity of an asset to various stressed events, not only confined to equity. It may also become a valid alternative to historical stress tests.

The simplicity of the computation has many advantages, and one of them is certainly the ability of comparing different types of risk, extracting information from asset track records.

A visual comparison helps more than a thousand words.

In the chart below, funds are plotted with DCR on the x-axis and annualized performance on the y-axis. The top-right quadrant contains funds which show an exceptional feature: they make money when one or more indices sell off. Beware, we are not talking of Pearson or Spearman correlations: a negative correlation with the S&P 500, for instance, does not mean automatically that an asset is likely to grow in price during a drawdown.

On the contrary, a negative DCR has exactly that meaning, and it gives substantial more information to investors.



We have adopted DCR in our analyses in combination with traditional risk measures, and we found the unorthodox approach much more effective in managing a portfolio of financial assets.

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Andrea started his financial career in 2001 working in the Risk Management department of large asset managers. In 2006 he switched to the hedge fund industry working for Mangart, one of the biggest European global macro funds, in charge of Risk Management and Operations. In 2009 he joined OnInvestments, manager of the long/short equity fund Antares and in the same year, he founded Quantyx, a service provider of external risk management.

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