

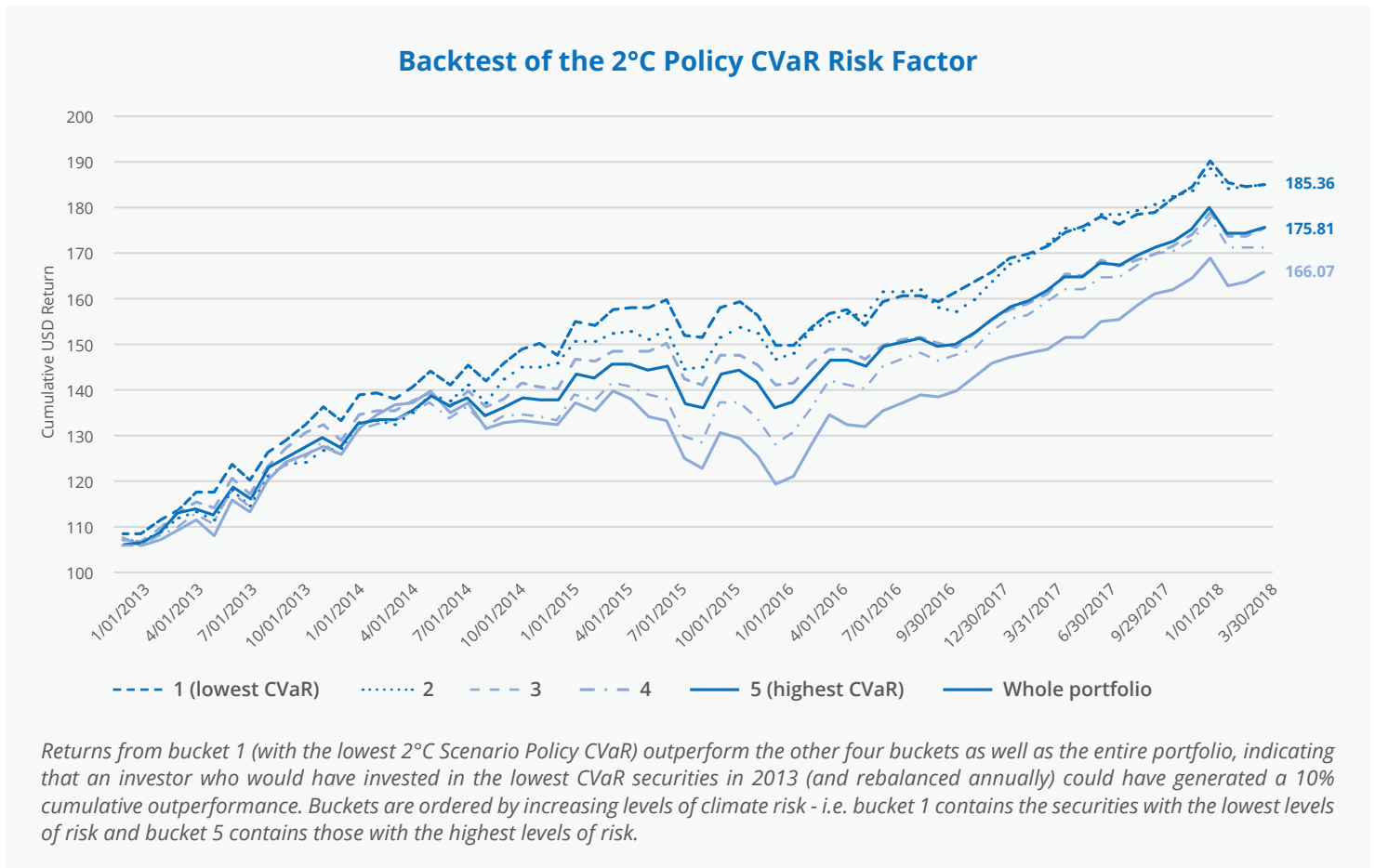
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BACKTESTING CLIMATE VALUE-AT-RISK YIELDS 10% OUTPERFORMANCE AGAINST DEVELOPED MARKETS EQUITY INDEX

“Backtesting”, in financial jargon, refers to a common simulation exercise used to explore the question: “how would my portfolio have performed if I had invested using a particular investment strategy in the past?” In this article we show that integrating Carbon Delta’s Climate Value-at-Risk® (CVaR) as the risk factor into an investment strategy based on the portfolio underlying the iShares MSCI World UCITS ETF could have yielded a 10% outperformance over the last 5 years.



Backtesting in investment practice

“Backtesting”, in financial jargon, refers to the practice of investigating a newly established or proposed investment strategy against historic market performance data. It is a simulation exercise to explore the question: “how would my portfolio have

performed if I had invested using different data or a different strategy in the past?”. Backtesting is usually employed to verify if a proposed investment strategy appears effective in reducing risk, generating excess returns, or both. Most financial

institutions require some sort of backtesting before implementing a new investment approach, and furthermore many regulators also require financial institutions to carry out backtesting within risk oversight procedures.

Whether climate change has an influence on the performance of financial assets is a question that has garnered increasing attention from the investor community over the last several years. The answer is not necessarily obvious: on the one hand, considering the difficulties of implementing the Paris Agreement and the long-term nature of the low-carbon transition, some investors may be tempted to believe that climate risk is not important or imminent enough to be integrated into investment processes and thus have a material impact on pricing; on the other hand, climate risk has become very topical within the ESG investing field – in part thanks to the work of the Task Force on Climate-related Financial Disclosures (TCFD) – and it seems reasonable to assume that the actions of the more climate-conscious investors (whether full divestment or mere marginal reallocation) have had an impact on the markets.

This article brings support to the latter viewpoint, suggesting that, for some time, climate change has indeed come with a considerable “shadow price” that investors are either paying or could use to their advantage.

Backtesting Climate Value-at-Risk® (CVaR)

Carbon Delta has backtested several CVaR metrics on the most common stock indices. The graph above illustrates that analysis on the portfolio underlying the iShares MSCI World UCITS ETF, using the 2°C Policy CVaR as the risk factor.

The portfolio contains approximately 1,600 equities and represents a broad cross-section of developed markets. The 2°C Policy CVaR is a measure of potential losses in a security's market value arising out of the costs of compliance with a climate policy that would be consistent with a 2°C global warming. The primary factor underpinning the 2°C Policy CVaR is the future cost related to emission reduction requirements, as described in the Paris Agreement.

In this simple example, we used a plain “bucketing” method: first, historical 2°C Policy CVaR metrics are computed for all

securities for the years 2013 to 2018; then, the portfolio is split into 5 equally-sized buckets of increasing levels of risk (i.e. bucket 1 contains the securities with the lowest risk and bucket 5 contains those with the highest risk) with yearly reallocation of constituents based on their then-prevailing 2°C Policy CVaR; and finally, the performances of all buckets are then compared against each other as well as against the whole portfolio.

The choice of timespan (2013 to 2018) reflects two key interrelated considerations: significance of climate-related risks in financial markets and data integrity. Although climate change laws and regulations have increased by a factor of more than 20 since 1997, the year of the Kyoto Protocol, a lag in implementation has caused a delay in the impact of these regulations on companies and therefore on financial markets, where climate risk concerns have mostly come to the fore during the last few years – arguably since discussions of stranded assets have become topical.

Outperformance of 10% in 5 years

The chart shows that an investor who would have used the 5 buckets of best and worst performers to reallocate weights in their portfolio could have increased their returns by up to 10% compared to a passive portfolio approach. This corresponds to an outperformance of about 1.75% per year.

These results suggest that the economy has already started experiencing the impacts of climate change regulation and that, although the process of implementation of countries' NDCs is ongoing, markets have already begun to integrate impending climate actions into securities pricing. The outperformance shown in this analysis, as well as our experience working with asset owners, asset managers and investors, both support this. It is also possible, if not likely, that this market adjustment will become more pronounced in the future.

In addition to this analysis, Carbon Delta has also backtested more aggressive policy scenarios such as a 1.5°C scenario. We have also constructed and backtested metrics which investigate the technological opportunities of companies in the transition to a low carbon economy. If you are interested in more of our findings related to backtesting climate risk metrics or just finding out more about our offering, please subscribe to The Emission and contact the author.



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Bruno Raus heads Carbon Delta's London office, working with clients on portfolio climate risk analysis as well as on new product development. Bruno has over 12 years of experience in mainstream finance, working as a credit structurer and trader for investment banks in London and Hong Kong. Prior to joining Carbon Delta, he worked in the fields of climate risk and sustainable infrastructure finance in academic institutions, co-authoring some of the first reports of the Transition Pathway Initiative at the London School of Economics and then taking on a role of Research Associate at Imperial College's Centre for Climate Finance and Investment. Bruno holds a Master of Management Engineering (Major in Finance) from the Université Libre de Bruxelles and an MSc in Environmental Economics and Climate Change from the London School of Economics.

Questions? Ideas? Talk directly to Bruno

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