MILLIMAN ARTICLE

Low Carbon Impact on Investment Risk Management

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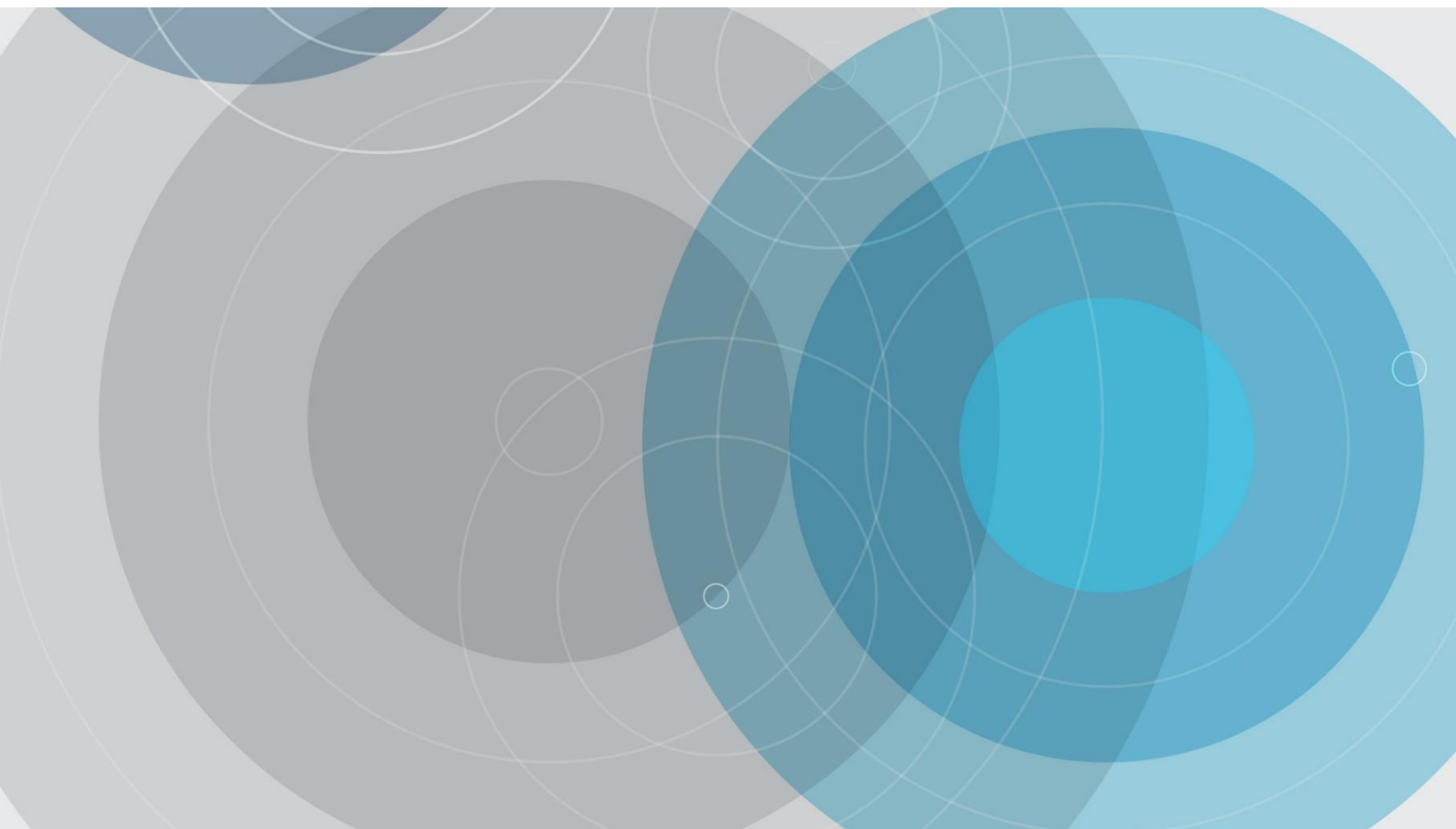

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Net Zero 2050 Alignment Now a Key Consideration

The UK has recently declared its latest update to its Nationally Determined Contribution ("NDC") of cutting carbon emissions by at least 68% of 1990 carbon emissions by 2030[1]. Several pension funds and insurers have declared commitments to align with Net Zero 2050 in recent months. This alongside sign-posting from the regulator with the recently released road-path to mandatory climate-related disclosures[2] (or 'TCFDs'), amongst other recent regulatory changes, means that ESG and climate risk have been rapidly increasing in importance as a consideration for trustees.

For most pension scheme members, 2050 is certainly within their investment horizon, and so from a risk perspective climate change risk is clearly likely to have a financially material impact on their outcomes. There are many ways to view and address this topic, ranging from a narrow consideration on climate transition risk management, to a wider perspective of contributing to addressing systemic economic and societal risk, to ensure that members retire into a world worth living in. Those with active mandates are likely to be more able and inclined to engage in a stewardship approach, often cited as preferable to divestment. However, those with more passive mandates potentially may be more restricted.

In our previous article, we discussed how low carbon equity indices could be a cost-effective way to take a first step in aligning with Net Zero 2050. This given the pressures of delivering value-for-money, and the many existing demands on charge revenue. A few examples are provided in the following table.

Equity sector	Traditional benchmark	Low Carbon benchmark	Reduction in carbon emissions
Global equity	MSCI World	MSCI World Low Carbon Leader	Methodology targets 50% reduction[3]
		MSCI World Low Carbon Target	Max. reduction for a tracking error of 0.3%
UK equity	FTSE	FTSE UK Low Carbon Select	Methodology targets 50% reduction[4]
US equity	S&P 500	S&P 500 ESG	Indirectly incorporated as part of the S&P DJI ESG scoring framework[5]

Data source: See footnotes on index methodology; Bloomberg data used for analysis

Managing Risk from ESG/Low Carbon Exposures

One common reticence over incorporating ESG or low carbon tilts, is that such specific exposures both reduce portfolio diversification and also potentially make portfolio risk management more challenging. There are two common approaches to risk management, aimed at protecting against periods of severe market volatility:

1. Diversification with government bonds
2. Hedging with derivatives (i.e. a short exposure acting as an offset)

Both of these approaches are reliant on correlation with risky assets.

Impact on Hedging with Derivatives

We firstly look at correlations between the low carbon or ESG indices, and their traditional parent benchmark. The table below shows that correlations of historic daily returns are high. This is no surprise given the index construction methodologies.

During the bull market period (for equities) of 2017-2019, correlations are above 90%. This indicates it is possible to construct a well performing hedge between a derivative on the traditional parent benchmark, against a fund invested in the low-carbon or ESG index exposures. We note that positive correlations would mean a hedge involve a short position, to act as an offset.

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[1] https://www.bbc.co.uk/news/science-environment-55179008
[2] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/933783/FINAL_TCFD_ROADMAP.pdf
[3] https://www.msci.com/low-carbon-indexes
[4] https://research.ftserussell.com/products/downloads/FTSE_ESG_Low_Carbon_Select_Index_Ground_Rules.pdf
[5] https://www.spglobal.com/_media/documents/the-sp-500-esg-index-integrating-esg-values-into-the-core.pdf; https://www.spglobal.com/spdji/en/documents/additional-material/faq-spdji-esg-scores.pdf

However, if we look at the crisis period of Q1 2020, we see that correlations are even higher. In the period where it matters most – when hedge exposures are likely to be high – the correlations are at their most optimal, indicating that you would expect hedge performance to hold up well too.

Correlations of Daily Returns			
ESG Index	**Base Index**	**2017-2019**	**2020 Q1**
MSCI World Low Carbon Target	MSCI World	99.3%	99.8%
MSCI World Low Carbon Leaders	MSCI World	99.3%	99.8%
FTSE UK Low Carbon Select	FTSE All Share	94.7%	96.5%
S&P 500 ESG	S&P 500	99.9%	100.0%

Data source: Bloomberg; Milliman analysis

Impact on Hedging with Derivatives

Now turning to correlations between equity indices and UK government bonds[6]. Repeating the same analysis, we see that correlations of daily historic returns are negative, as you would expect, and so meaning a long position acts as an offset.

If we compare correlations between traditional parent benchmarks and their low carbon or ESG equivalents, we see that they are fairly similar. One key difference in this analysis, is with the UK equity exposure. The low carbon index is less well correlated in the equity bull market of 2017-2019, but more correlated in the crisis period of Q1 2020, which is of more importance.

Overall though, when looking at daily returns, correlations are generally materially lower for a diversification with UK government bonds, than for hedging with a derivative. In recent times, with Brexit and associated volatility of the UK currency, UK gilts have been performing less well as a safe haven asset than they have historically. If, for example, we instead compare to US Treasuries (also shown in the table), we see that correlations do improve.

That said, looking more broadly at returns across the quarter, UK gilts returned a positive 6.9%, and so would have provided an effective partial hedge against the equity falls during Q1 2020 when considering quarterly return. Although the journey over the period would have been less smooth for diversification with government bonds, compared to that from hedging with derivatives, due to the lower extent of correlation on a daily return basis.

Correlations of Returns	*Daily (UK Gilts)*	*Daily (UK Gilts)*	*Daily (US Treasuries)*
Index	**Last 3Y**	**2020 Q1**	**2020 Q1**
MSCI World	-22.0%	-14.8%	-37.8%
MSCI World Low Carbon Target	-22.7%	-13.9%	-38.6%
MSCI World Low Carbon Leaders	-22.8%	-13.0%	-37.8%
FTSE All Share	-11.3%	-10.3%	-27.6%
FTSE UK Low Carbon Select	-3.9%	-16.6%	-31.5%
S&P 500	-18.1%	-18.9%	-42.7%
S&P 500 ESG	-17.9%	-19.3%	-42.7%

Data source: Bloomberg; Milliman analysis

[6] UK Gilts All Maturities

Risk Management Cost Differentials

Correlation can indicate effectiveness of a hedge. However, it is important to consider the long-term cost to risk management too. In previous articles, we have discussed the comparative cost between diversification into government bonds and hedging, particularly in a low interest rate world. How does hedging a specific low-carbon index exposure specifically impact this cost comparison?

Such a strategy would involve holding a long low-carbon underlying fund, and a short higher-carbon indexed derivative. From a long-term investing perspective, given the thesis of aligning with a decarbonising world – where many governments and corporations are planning for a journey decarbonisations – being long low-carbon and short higher-carbon (on average) is likely to be considered an attractive positioning for these projected pathways. Intuitively you may expect a long-term gain from such positioning, to offset against typical hedging costs (from the ongoing dynamic adjustment of hedges), and so provide a reduction in risk management cost.

Summary

In our previous article, we illustrated how experience this year has demonstrated that low-carbon indices can be a useful tool to significantly reduce carbon emissions/footprint from a passive equity portfolio, whilst potentially having favourable returns net of cost, and potentially reduced investment risk. Although the results discussed were only over a short-term perspective, they should at least demonstrate that performance and cost need not necessarily be a hindrance in taking first steps to align with Net Zero 2050.

One other common reticence over the use of low-carbon indices, is that they are sometimes perceived to be less effective when combined with risk management. The results in this article show that, based upon recent experience, this also need not necessarily be the case. It is possible for existing risk management approaches to still be combined effectively with ESG and low carbon tilts.

In fact, correlations indicate that hedging with derivatives on traditional benchmarks, has the potential to be a particularly effective risk management approach with low-carbon equity indices. It is also potentially advantageous from a long-term investment perspective too, given the comparative net carbon position when considering the combination of the fund and an accompanying hedge.

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The results shown are historical, for informational purposes only, not reflective of any investment, and do not guarantee future results. Any reference to a market index is included for illustrative purposes only, as it is not possible to directly invest in an index. Indices are unmanaged, hypothetical vehicles that serve as market indicators and do not account for the deduction of management fees or transaction costs generally associated with investable products, which otherwise have the effect of reducing the results of an actual investment portfolio.

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