

# Fixed Income innovation: applying ESG and carry factors to an emerging markets portfolio

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## Introduction

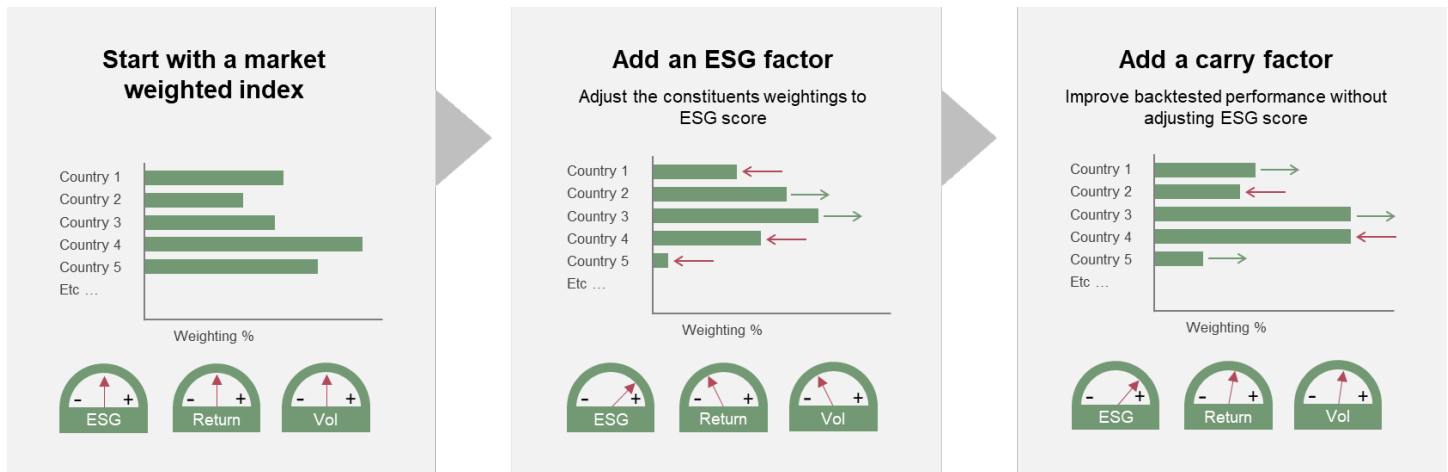
Attitude towards market change has been slow historically but the evolution of ESG portfolios has been an exception. The need for a new generation of ESG fixed income indices is already changing the fixed income landscape and will increase as investor priorities continue to evolve. This paper looks at how we intend to adapt our existing passive, market-weight indices to meet this rapidly changing dynamic. We work through the process of taking a dollar EM index and adapting it with an ESG tilt factor, and enhancing the backtested return with a carry factor.

We believe applying factors to traditional fixed income indices will be more valuable in the future than it has been in the past. Since 2009 quantitative easing ('QE') and easy-money has resulted in a bull-market, low default, high correlation fixed income world. In this world, traditionally based analyst research and fundamental asset selection has not been as successful as a leveraged, high-beta, lower quality approach. With rates rising and QE unwinding, these macro supports are gone and there is likely to be more portfolio performance differentiation in the years ahead.

Equally, with sustainable investments growing as an asset class, current SI-premiums are likely to be more pronounced in the future than they have been in the past. While ESG methodology may evolve, and priorities shift, it seems improbable that investor appetite returns to focus more on returns, at the exclusion of everything else. Therefore, the future might see more differentiation than can be discerned from looking backward.

In the first section, we provide an overview of the process of new index creation by outlining our objectives and method. In the second section, we examine the application of an ESG tilt factor in more detail and the resulting effect it has on the risk of the portfolio. In the third section, we add a 'carry' factor and repeat our risk analysis. Finally, we make some broad conclusions about what we have created with our new index method.

Figure 1. Schematic Index creation process



Source: FTSE Russell.

## 1. Process for creating a dollar EM ESG tilt index with carry overlay

The core of FTSE Russell index [methodology](#) is a combination of principles of: objectivity, relevance, modularity, predictability and replicability. In constructing our index we lean heavily on all of these.

### Start with a market weighted index

Our starting point is the market weighted FTSE EMUSDGBI index, which is an index of sovereign EM issuers into the dollar bond market. This is already a popular investment category in its own right. To this *objectively* defined and investor *relevant* index, we add our *modular* overlays of both ESG tilt methodology and carry optimization.

### Add an ESG factor: Tilt towards names that exhibit ESG characteristics

The first step is to reweight the index in favor of ESG names. The ESG tilt modifies the original market weighted index into one which is overweight those names that have higher ESG scores using our well-established 'Beyond Ratings' methodology. The new index underweights large issuers with poor ESG scores, such as Turkey. Equally, countries that score well, such as Poland, might find themselves as one of the bigger allocations.

### Assess the degree of tilt 'appetite'

The ESG tilt has a scalar component that can modify the degree of tilt in the index, depending on the appetite of the client: the greater the tilt, the higher the aggregate ESG score. But increasing the tilt also implies a greater difference in performance relative to the original index.

This performance differential can create a dilemma for a client who wants a more decisive tilt but is unhappy if this is at the cost of significant performance or higher volatility. As we discuss in the

next section, adding an ESG factor to an index does not always reduce performance as weaker ESG countries tend to carry a greater yield risk premium.

## Add other fixed income factors such as ‘carry’ to improve returns

In cases where performance does drop, it may be attractive to consider adding a second factor to the ESG tilt to increase performance. Our carry factor allocates the portfolio in favor of assets with a more attractive carry by looking at both the absolute level and slope of the yield curve; a steep curve is more attractive than a flat or inverted curve. In our carry section the backtesting illustrates how a focus on carry rather than just increasing duration or credit risk would have improved historic returns.

Let us go through the methodology of some of these steps in more detail, starting with the ESG factor.

## 2. Defining the ESG tilt factor

The core dilemma for the method is finding the best way to marry the financial prudence of a well-diversified fixed income portfolio with higher ESG standards. Therefore, for ESG integration we prefer a ‘tilt’ over an ‘exclusion’ approach, although we often combine a tilt with negative screening. Just excluding names altogether fails the prudence test, while a ‘tilt’ methodology essentially reweights a portfolio in favor of names that outperform their peers in a series of independent and objective ESG ‘scores’. In this approach, the severity of the ‘tilt’ can be calibrated to the ESG ‘appetite’ of the investor. However, the greater the tilt, the greater the probable divergence in characteristics to the original portfolio.

We split a description of this method into three segments:

- the ESG category scoring,
- the aggregation of multiple scores to a single ESG score by country and
- the application of a tilt method that reflects this score

### ESG scoring

At the core of FTSE Russell’s ESG methodology is [‘The Sovereign Risk Monitor’](#) (SRM) which has been developed by Beyond Ratings. SRM is a quantitative, relative and systematic approach, based on 69 indicators for 146 countries, divided into seven pillars of sovereign risk assessment. A score is calculated on a quarterly basis for each indicator, starting from 1999.

The indicator scores that are produced are divided into financial and sustainability pillars. For the purpose of this paper, we are going to focus on the three sustainability pillars: Environmental, Social and Governance. These aggregated scores are then compared to their peers and a final, normally distributed score is created for each sovereign. Statistical methods are used to standardize the scores so that they become more relative than absolute.

The best way to illustrate this is to step through an example. We are going to use Uruguay. Consider the individual theme scores for the Environmental pillar in Table 2 below.

**Figure 2: Sustainability Performance breakdown for Uruguay**

Environmental			Social			Governance		
Risk theme	2021	2022	Risk theme	2021	2022	Risk theme	2021	2022
<b>Energy</b>	70.7	62.9	<b>Human capital</b>	33.1	24.1	<b>Control of corruption</b>	90.1	90.1
Energy policy	89.2	94.2	<b>Health</b>	84.6	83.3	<b>Government effectiveness</b>	76.2	70.7
Fossil fuel risks	48.9	41	<b>Social wellbeing</b>	84.3	80.1	<b>Political stability</b>	89.5	90.1
Energy independence	76.3	39.4	<b>Inequality</b>	71.2	72.1	<b>Regulatory quality</b>	70.3	67.9
<b>Climate</b>	60.3	61.8	<b>Employment</b>	39.5	62.2	<b>Rule of law</b>	74.6	76.7
Physical risk	59.2	62.5	<b>Accountability</b>	93.8	91.6			
Transitional risk	64.1	59.6						
<b>Resources</b>	65.8	74						
Natural resources	54.6	69.4						
Air & water	90.7	84.3						

Source: Beyond Ratings as of April 2020.

Among the individual scores, ‘access to electricity’(Energy Policy) and ‘low levels of air pollution’ (Air & Water) are two examples of attributes that raises Uruguay’s score upwards relative to its peers Equally, low corruption and political stability raises the governance score.

## Combining scores to a single score by country

Having ranked each country objectively, we need to combine the scores into a single factor.

Moving from a series of single score to a score per country is reliant on an econometric calibration that varies depending on the market. Each sub-category has different weighting and emerging markets get a separate set of weightings than developed markets for example. In calculating the overall “Governance” score, the “Rule of Law” category gets a higher weighting than “Political stability” for instance.

Equally “Governance” gets a higher weighting than “Environmental” and “Social” when moving to an overall ESG score. The [Sovereign Risk Monitor](#) provides more detail.

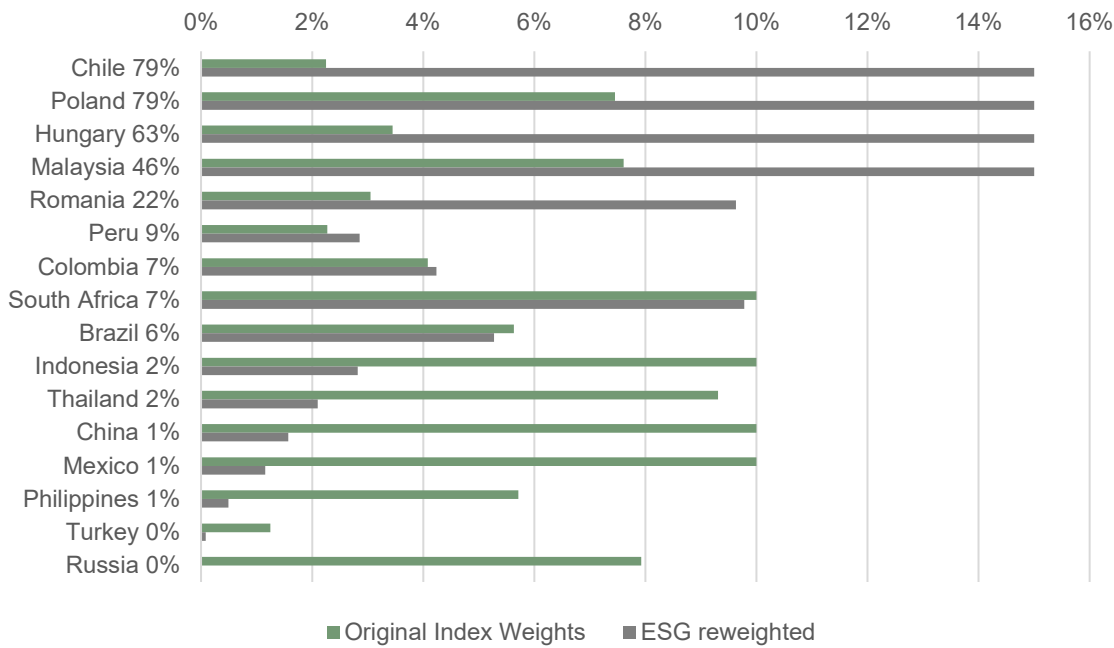
## Tilting the portfolio weightings

The next stage of the process is to ‘tilt’ the weighting of the portfolio towards those names with higher ESG scores. This involves a normally distributed fitting process that is calibrated by a ‘tilt-strength’ parameter. This makes it possible to vary the tilt according to ESG appetite. Finer detail of the tilt methodology can be found [here](#).

An index with a small number of constituents makes a more convenient example. Typically, with a smaller index we need to cap the maximum weighting to avoid concentration risk. In this example, the original EM index had an issuer cap of 10% and we have introduced a second issuer cap on the ESG tilted portfolio of 15%. This has been applied to Chile, Poland, Hungary and Malaysia as

can be seen in gray in Figure 3 and the market weightings before tilting can be seen in green. The ESG score appears after the country name.

**Figure 3. Countries of the EMGBI-Capped ranked by ESG score with weightings before and after ESG tilt as of April 2022**



Source: FTSE Russell as of end of April 2022.

Reweightings an index gives it a different risk profile. As we stated at the outset, at the core of the philosophy is a balance between financial prudence and ESG adherence. We want to tilt towards ESG but not to such an extent as to make the investment unattractive from a risk perspective, such as becoming excessively volatile for instance. Consider the following table that illustrates how the risk profile changes as we tilt our EM index towards ESG:

**Figure 4. Changing risk factors for ESG EM portfolio.**

Index	Effective duration (years)	YTM (%)	Avg. rating	OAS	Index E	Index S	Index G	Avg. ESG	GHG Emissions (2021)
Market Value EMUSDGBI	8.31	6.39	BB+	397	55.27	47.18	45.87	49.44	738
ESG EMUSDGBI	9.07	5.22	BBB	280	56.67	53.97	59.27	56.63	560

Source: FTSE Russell as of April 2022.

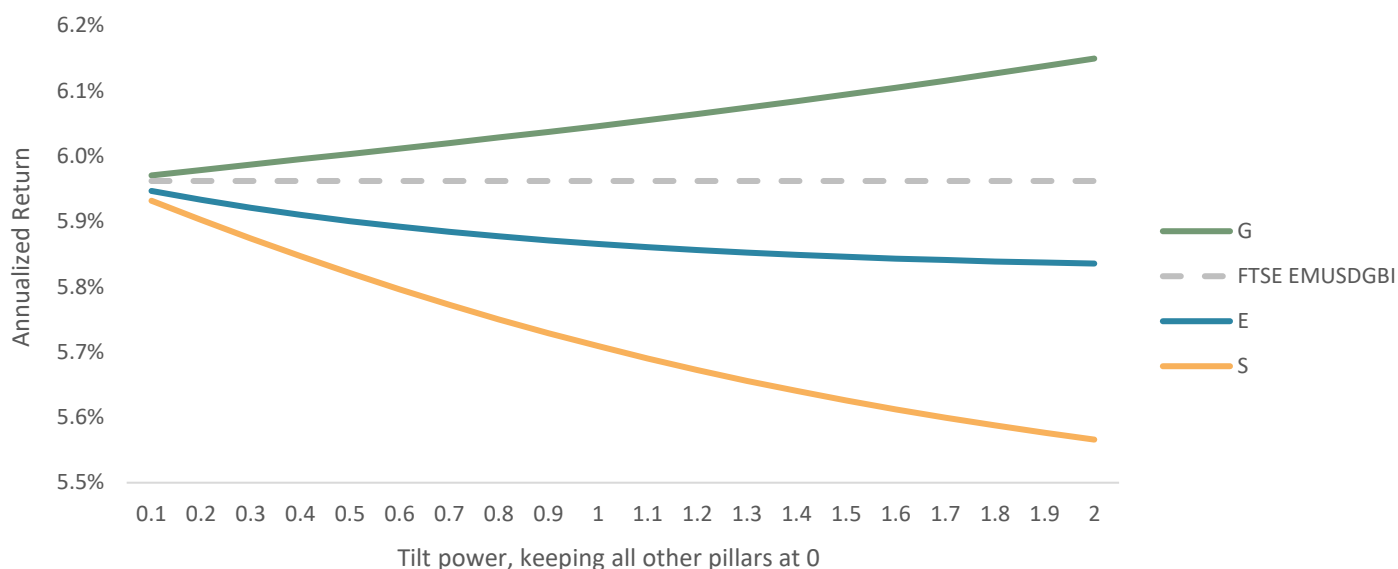
## The effect of an ESG factor on the risk and return profile of an index

Reweighting an index will give it a different risk profile and there is a balance to be struck between ESG appetite and prudent portfolio construction. Investors tend to assume that an ESG factor damages performance. We wrote a blog [here](#) which demonstrated how this is not always the case and showcased how ESG portfolios can offer better returns and lower volatility. Our example in this EMUSDGBI index shows that the ESG version has a higher average return and lower volatility than the base index.

When introducing an ESG factor to an index, it is also useful to flex the individual pillars one by one to gain a better understanding of how they affect the returns. For instance, in the EM portfolio below, we found that the Governance risk factor consistently improved the performance in backtesting. This can be seen in figure 5. Equally, re-weighting in favor of Environmental and Social factors did not produce better results.

Our FTSE ESG EMUSDGBI example applies a three-pillar tilt approach to market value weights. However, the Environmental and Social factors have a smaller contribution to the resulting factor tilt compared to the Governance pillar. This means that the 'G' factor lifts the whole index to higher returns even though the 'S' and 'E' factors do not have a positive impact on returns on their own.

**Figure 5. Impact of E, S and G pillars in isolation on historical annualized returns, April 2022**



Metric	EMUSDGBI	ESG EMUSDGBI
Annualized return	5.96%	6.04%
Annualized volatility	7.89%	7.09%
Return / risk	0.76	0.85
Tracking error		1.90%
Weighted average ESG score	49.29	55.94

Source: FTSE Russell as of April 2022.

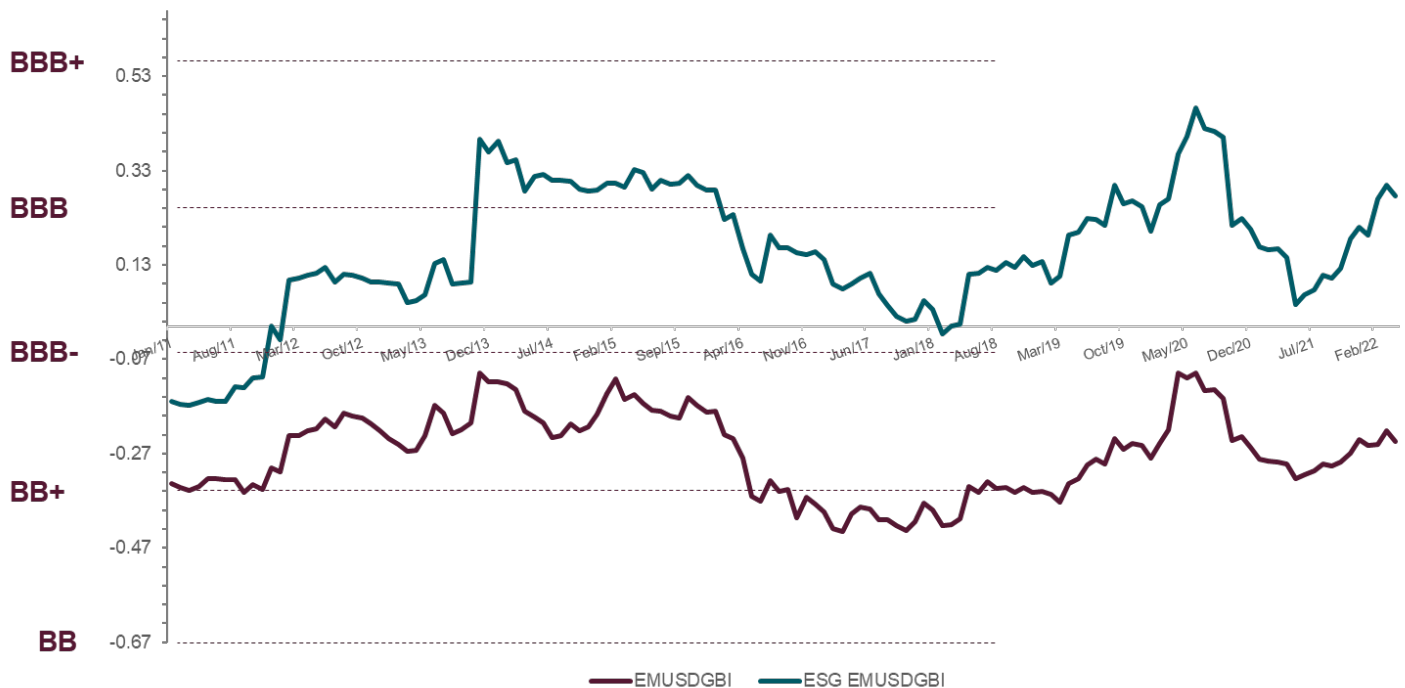
The result is an increased average ESG score of 55.9, 14% higher than the market value weighted index. At the same time, return per unit of risk is higher and tracking error versus the base index is still relatively low at 1.9%.

## ESG and Credit Risk

Changing the portfolio composition means changing the average credit rating. Going up or down in credit quality is likely to effect returns and other risk dynamics as well. While there is a demonstrated correlation between good ESG and higher developed markets credit ratings, our study found little or no correlation in emerging market credit spreads. The study in [“Pricing ESG risk in sovereign credit”](#) examined CDS spreads and ESG score between 2011 and 2018 and found no statistical connection between them. This might be a lagging development and we might find that emerging markets increasingly price this as ESG awareness becomes a bigger element in this sector of the fixed income market.

Our ESG EM portfolio (teal line) achieved a better average credit rating through its life as can be seen below.

**Figure 6. Average rating of portfolio over time**



Source: FTSE Russell as of end of April 2022.

The lack of correlation between ESG and rating might help to explain why we found that our ESG EM portfolio outperformed the base portfolio (burgundy line). Certainly, this is not the case in all portfolios. But, even when the performance is better, as in our example, we suggest considering giving it an uplift by adding a ‘carry’ factor.

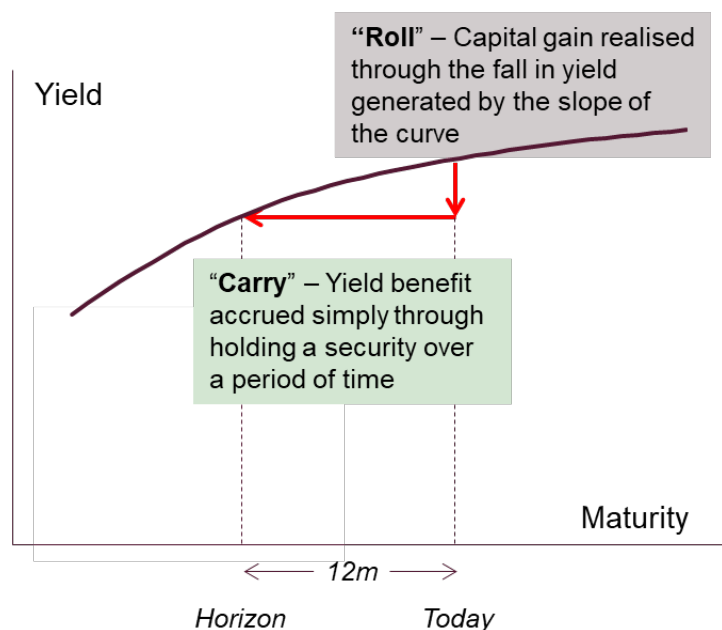
### 3. Defining the Carry factor

Adding a carry factor is done so that bonds with a high carry are given a greater weighting than bonds with a low carry. In equity factors, 'dividend' carry is popular and typically conservative, but the definition is different in fixed income where it is less conservative.

FTSE Russell define 'carry' as the expected return on a bond over a year assuming no market change in the yield curve. While this 'no change' assumption is unrealistic, if we say there is an equal chance of a rally and sell-off, then choosing high carry bonds has historically provided a better return in the backtesting, without increasing the credit risk.

This theoretical return over one year can be decomposed into carry and roll. 'Carry' is the time value of money or the interest earned over the year. 'Roll' comes from the fact that typically yield curve are upward sloping so a 4-year yield will be less than a 5-year yield. Therefore, we expect a return from this change in maturity over the course of a year. From a roll perspective, a steeper curve is more attractive than a flat or inverted one

Figure 7. Schematic of carry and roll



Source: FTSE Russell.

The process for determining weighting is as follows. The carry/roll return for each asset is calculated. This return is compared to the average return across the sample set, leaving half of the set positive and half negative; extremes are removed. This relative return cohort is then ranked between 0 and 1, normalized, and each asset given a score in a process which is like the ESG method.

The portfolio can then be 'tilted' in the same manner as tilting the ESG portfolio in the previous step, but in this case towards assets that score better in the carry analysis. Equally the strength of the tilt can be adjusted according to risk appetite. A stronger tilt will mean that the portfolio deviates further from the original portfolio and will affect the risk profile.

This process duration matches to the index so that improved performance is not simply achieved by a longer duration.



## 4. Putting it altogether: example of the effect on risk characteristics

Changing the weighting of an index changes its risk characteristics and any new index needs to be backtested to ensure that these changes are desirable. Basket testing results and comparing them to the original index are key ways of assessing these risks

Let us take an example of our USD EM sovereign index and work through some of the practical considerations. In the following example, we perform a carry tilt factor on the more liquid (typically investment grade and less 'frontier') portion of the index and maintain the existing ESG tilted weights on the remainder. We opt for a tilt strength of 2 as an example although typically we would consider the relative performance of many different weightings.

**Figure 8. Schematic for our three different tilt scenarios**

	Number of names	Market value	Quality	Weight	Duration
ESH EMGBI liquid names	16	50%	More IG	Carry tilt factor	Duration matched
Remainder	50	50%	More Frontier	Market value	Market value

Source: FTSE Russell, EMUSDGBI tested 2012-2022 as of January 2022

When we apply these tilt strengths to our tilted ESG portfolio we get the following results.

**Figure 9. Risk Characteristics of EMUSDGBI after carry tilt factor**

Metric	EMUSDGBI	ESG EMUSDGBI	Carry Tilt ESG EMUSDGBI
Annual return (USD)	5.21%	5.33%	6.05%
Annual Volume	7.85%	7.05%	7.82%
Risk-adjusted returns	0.66	0.76	0.77
Tracking error			1.83%

Source: FTSE Russell, EMUSDGBI tested 2012-2022 as of January 2022.

In this table, we can see that applying the ESG tilt factor improves the return, volatility and risk-adjusted returns. Adding a 'carry' tilt improves the return but does not improve the risk-adjusted return. When building an index we would explore different tilt strengths and portfolio choices depending on risk appetite.

## 5. Conclusions

In thinking about the risk profile of these new indices it is useful to compare them to existing indices but only in benchmark terms. In other words, the objective of the process we have outlined is to create something new with different risk characteristics rather than a sub-index that tracks its parent.

In EM fixed income markets, in particular, some of the larger issuers such as China and Turkey also have some of the lower ESG scores, which means that tilting away from them adds significant changes to the portfolio. These changes also affect diversification and credit profile

In addition, including a carry optimization is another way of improving returns so that investors are not faced with a dilemma of choosing between return vs. ESG in the first place. The downside is that carry can be pro-cyclical. It offers higher returns during a rally and typically higher drawdowns in a sell-off; although, this is not inevitable. We suggest that care and attention in construction can help balance all these risks and offer a more attractive product.

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