

Commodity Indices

Enhancing Roll Yield: A More Liquid & Diversified Index

May 2021

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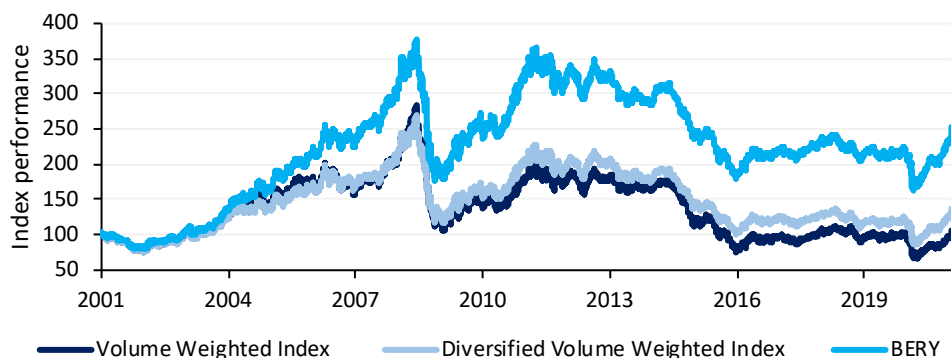
ABSTRACT

Commodity markets have once again returned to the limelight. In early 2020, the spread of COVID-19 sparked a sharp sell-off in energy. More recently, fears of rising inflation—stoked by rising government indebtedness and the hopes of a global economic recovery—has spurred a sharp increase in commodities prices. Long viewed as an inflation hedge and a returns diversifier for fixed income and equities investors, commodities have been a staple in asset allocation decision-making. Broad-based benchmarks such as the [Bloomberg Commodity Index \(BCOM\)](#) provide efficient exposures to demand/supply dynamics in the physical markets. Furthermore, the inclusion of commodities in consumer/producer price indices translates to long run correlation with both realized and expected inflation.

Benchmark investors tend to accrue a negative roll return given the typical shape of futures curves, the contribution of which varies over the course of the economic cycle. Commodity and contract selection determines the magnitude of the index's roll return which, in [alternative risk premia \(ARP\)](#) parlance corresponds to the curve and backwardation premia. Traditionally accessed via systematic long/short strategies, these premia can be reconfigured for the benefit of long-only benchmark investors—resulting in portfolios which continue to provide the desired asset allocation characteristics while enhancing the carry properties. In this publication we:

- Assess the inflation hedging and portfolio diversification properties;
- Explore the liquidity characteristics for US dollar-denominated commodities and investigate the dynamics of roll yield across commodities and sectors;
- Highlight the role of diversification, contract selection and commodity tilts in benchmark construction; and
- Construct the [Bloomberg Enhanced Roll Yield Index \(BERY\)](#) using a rules-based approach that maintains diversified commodity exposure while introducing factor tilts in the form of the carry risk premium.

Figure 1: Bloomberg Enhanced Roll Yield Excess Return Index



Source: Bloomberg

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Introduction

Commodities have long been an integral part of institutional investors' portfolios. Commonly viewed as an inflation hedge, they also provide returns diversification for equities and fixed income portfolios. The most common investment route is via the futures markets, as most financial investors do not want to take delivery or manage storage of the underlying commodities represented by the futures contracts.

An important concept in futures investing is roll yield, which can be defined as the return generated when an investor migrates ("rolls") an open position to a future with a longer-dated expiry. This return is a result of the convergence of futures' prices to the spot price. Ex-ante, a proxy measure for expected roll returns (roll yield) is the slope of the futures curves. For the duration of this publication, we refer to roll yield and roll return interchangeably.

A feature of commodity markets is that over the long term, broad benchmarks tend to deliver a negative roll return which can dampen portfolio returns. Considering this, a key objective for investors is maintaining the underlying characteristics of a commodity portfolio—pro-cyclicality to the industrial cycle, sensitivity to inflation and a low, long-run correlation to global fixed income and equities—while improving the roll yield characteristics.

[Alternative risk premia \(ARP\)](#) investing has become increasingly popular over the past few decades. This approach to investing is based on exposure to (non-asset class) risk factors that provide a long-run positive expected return. We have written extensively on this subject including a primer discussing the major investment themes/styles ([Sequencing the Strategy Genome, May 2011](#)) and aspects of portfolio construction ([Benchmarking Alternative Risk Premia, Dec 2020](#)).

The most popular styles with commodity investors are carry and trend-following. In this publication we focus on the carry as it is most directly relevant in addressing the need to enhance roll yield for long-only investors. The paper is divided into six topics:

- Inflation response, asset allocation and returns characteristics (page 4)
- Impact of roll return in commodity markets (page 6)
- Investment universe and liquidity measurement (page 8)
- Performance assessment of liquidity-based portfolios and the impact of diversification (page 10)
- Identifying the carry risk premium in commodity markets (page 12)
 - Accessing the curve premium
 - Incorporating the backwardation premium
- [Bloomberg Enhanced Roll Yield Index](#) (page 14)

All analysis is carried out using excess (over funding) returns data with the exception of the asset allocation study (pages 4-5) which uses total returns data.

Commodity characteristics

The link between inflation and commodities is in large part due to the makeup of the basket of goods and services that determine the underlying consumer price index (CPI) as calculated by the U.S. Bureau of Labor Statistics¹. This relationship can be illustrated by regressing monthly returns for the [Bloomberg Commodity Index \(BCOM\)](#) and BCOM sector components against changes in the [non-seasonally adjusted US CPI](#) (Figure 2). It reveals statistically significant coefficients for the composite benchmark and energy and industrial metals sectors (t-stats of 4.7, 5.7 and 2.7 respectively)—in line with our previous study ([Inflation and Commodities: Examining the Link, April 2019](#)).

Figure 2: Inflation sensitivity: Significance by sector (1991 – 2021)

	BCOM	Energy	Precious	Industrial	Agriculture	Livestock
Coefficient	3.11	7.38	0.68	2.53	0.56	1.04
T- stat	4.73	5.67	0.82	2.74	0.67	1.50

Source: Bloomberg

Investors' portfolios are impacted not only by realized inflation (as measured by changes in CPI), but also inflation expectations (see [A Toolkit for Inflation Hedging, Dec 2020](#) for a detailed discussion on the components of inflation). Regressing monthly BCOM returns on monthly changes in the US breakeven rates results in a highly statistically significant coefficient (t-stat of 9.6). The main takeaway from the regression analysis is that a broad-based commodities portfolio like BCOM has, historically, provided a hedge to both forms of inflation.

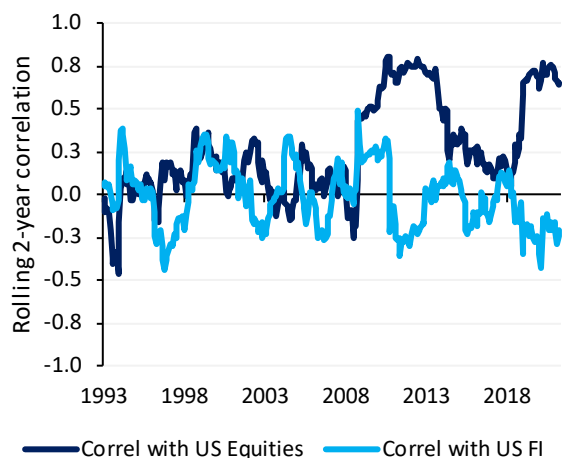
Asset allocation

Since 1990, based on monthly returns, the [Bloomberg Commodity Index Total Return \(BCOMTR\)](#) was uncorrelated to US fixed income ([LBUSTRUU](#)) and has displayed a low-to-moderate correlation (0.3) with US equities² ([B500T](#)). A closer look via rolling correlations (Figure 3) reveals the fixed income correlation oscillates between -0.5 and 0.3 while the equity correlation has a wider band and has tended to be stronger post-Credit Crisis. The conditional behavior of commodity returns—sorted by quintiles of US equity and fixed income returns—highlight tail behavior (Figure 4). While commodities provide a strong hedge for fixed income investors, they do experience negative returns when equities perform worst.

¹ <https://www.bls.gov/news.release/cpi.toc.htm>

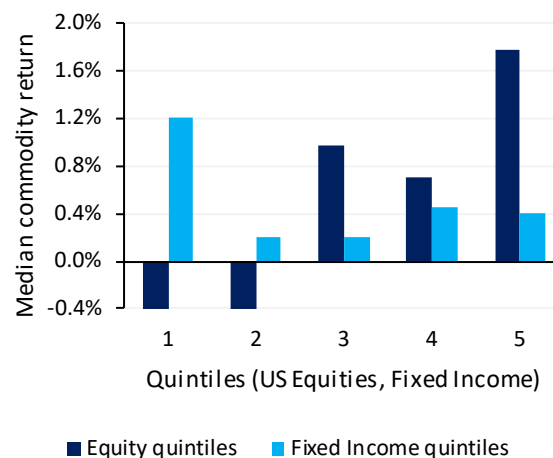
² Prior to March 2007, we use a proxy portfolio

Figure 3: Rolling correlations with US equities & fixed income (1991 – Mar 2021)



Source: Bloomberg

Figure 4: Conditional commodity returns (1991 – Mar 2021)



Source: Bloomberg

Sector correlations

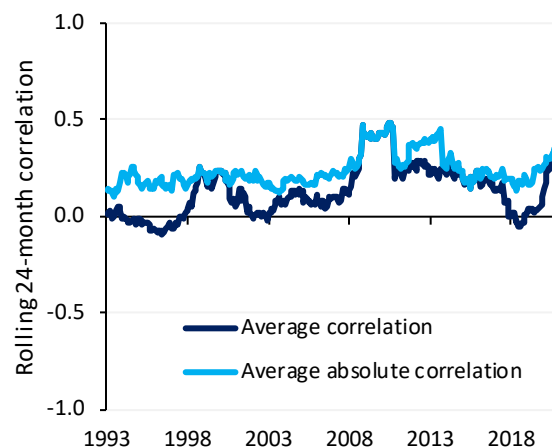
Over the past 30 years, the five main commodity sectors have displayed low-to-modest correlations. Using the five BCOM sector indices—**BCOMEN** (Energy), **BCOMIN** (Industrial Metals), **BCOMPR** (Precious Metals), **BCOMAG** (Agriculture) and **BCOMLI** (Livestock)—to replicate sector returns, we can see from Figure 5 the potential benefits of diversification. Looking at the rolling (24-month) average, pairwise sector correlations provide a summary of how inter-sector relationships change over time (Figure 6). The two key takeaways are (1) the similarity in average correlations and average absolute correlations confirms the low, positive correlations across sectors and (2) the range of absolute correlations are fairly narrow (0.2 – 0.5).

Figure 5: Sector correlations (1991 – Mar 2021)

	BCOMEN	BOMPR	BCOMIN	BCOMAG	BCOMLI
BCOMEN		0.16	0.32	0.21	0.15
BOMPR			0.33	0.25	-0.04
BCOMIN				0.32	0.09
BCOMAG					0.03
BCOMLI					

Source: Bloomberg

Figure 6: Evolution over time (1991 – Mar 2021)



Source: Bloomberg

Roll yield and the impact on performance

Commodities' futures curves are driven by fundamentals linked to the economic cycle, seasonality, storage characteristics and financing costs and the time to delivery. A commonly used measure of slope is the percentage difference between the price of the nearby contract and 12-month deferred contract prices. For ease of exposition, we measure the annualized slope as below:

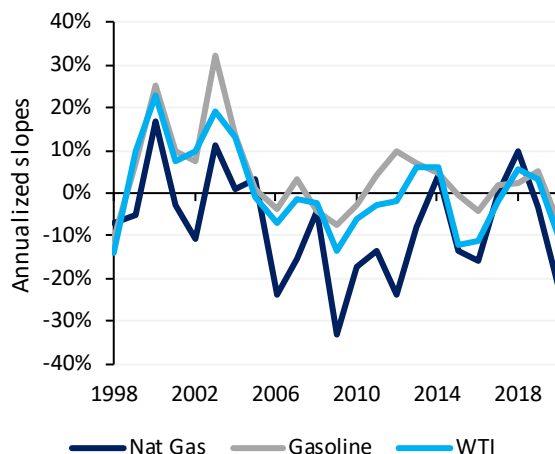
$$Slope_t = \left(\frac{p_t^N}{p_t^{12mos}} - 1 \right) \times \left(\frac{1}{yearfrac(exp_N, exp_{12mos})} \right)$$

Where p refers to the price of the nearby (N) and 12-months deferred ($12mos$) contracts, exp refers to the expiry date of the futures contracts and $yearfrac$ is the time between contract expiries in years. A positive slope corresponds to a state of backwardation—i.e. when the roll yield is positive.

The same calendar contracts are used to avoid seasonality issues, which are especially prevalent in agricultural commodities (harvest cycle) and energy (weather related). The annualizing factor is to ensure a like-for-like measure between commodities given differing expiry dates. We calculate commodity slopes over the period 1998 – March 2021.

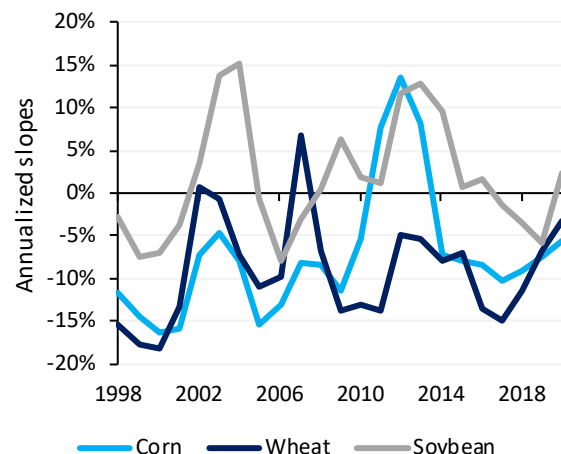
Commodity slopes can vary significantly even within a sector and is illustrated by looking at selected commodities in energy and agriculture (Figures 7 and 8 respectively). The annual slope is used (calculated as the average value of the daily slope values within the calendar year) to mitigate seasonal effects and allow for non-overlapping periods. As can be seen, the size of the slopes vary with time as does the rank ordering between commodities. Current values for commodity slopes can be found on the Terminal in the [Bloomberg Intelligence Commodity Data Library](#).

Figure 7: Annual slopes: Energy commodities (1998 – 2020)



Source: Bloomberg

Figure 8: Annual slopes: Agricultural commodities (1998 – 2020)

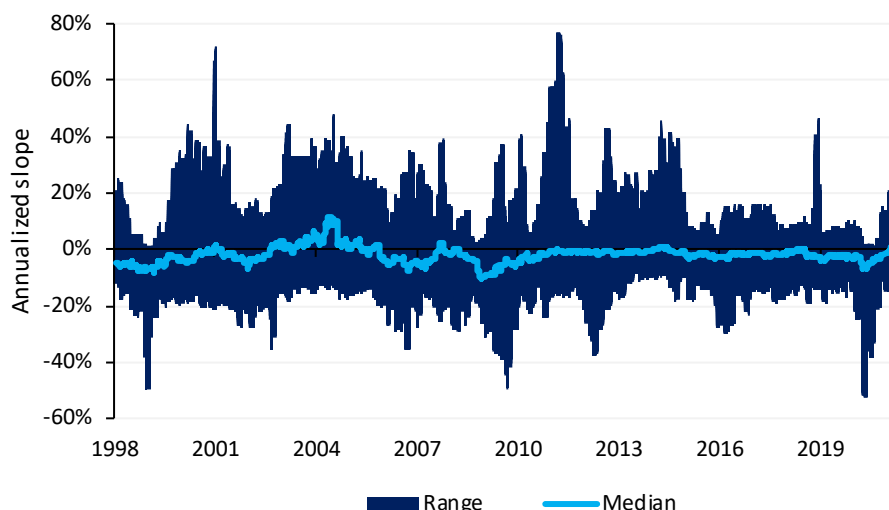


Source: Bloomberg

For each day during this 30-year period, the dispersion of slope values is large, as seen in Figure 9. The slope of each futures curve is directly related to the roll yield associated with that commodity. Roll yield is the return associated with the process of moving an open position between different futures contracts as they mature. If contracts with shorter expiries have lower/higher prices than contracts with longer expiries, the futures

curve is in contango/backwardation. In the case of backwardation (contango), investors will accrue a positive (negative) roll return as the futures price increases (decreases) with the passage of time. The magnitude of the roll yield is a direct function of futures prices.

Figure 9: Range of commodity slope values (1998 – Mar 2021)



Source: Bloomberg

The longer end of the curve (12+ months) tends to be driven by longer term demand/supply dynamics while contracts nearer expiry can have higher volatility due to demand/supply disruptions. This can be illustrated by looking at the BCOM index which has an annualized volatility of 14.7% since 1991 compared with 13.5% for the [BCOM 3-Month Forward Index \(BCOMF3\)](#). As we also see from Figure 9, the median slope is negative most of the time, which translates to a curve in contango. In such a state, a deferred position has a less negative roll return. Using the excess return and spot return indices for the BCOM benchmark and the sector indices, we calculate the (implied) roll returns (Figure 10).

Figure 10: Roll returns: Front contract versus 3-months forward (1991 – Mar 2021)

	BCOM	Energy	Precious metals	Industrial metals	Agriculture	Livestock
Front	-5.6%	-8.3%	-3.0%	-1.9%	-6.4%	-7.1%
3-months deferred	-2.4%	-1.8%	-2.8%	-0.5%	-4.4%	-1.5%
Difference (3months - Front)	3.2%	6.5%	0.2%	1.5%	2.0%	5.6%

Source: Bloomberg

What is striking is the uniformly negative roll yield across all sectors—both when invested in the front contract and the 3-months forward point. However, we also see the difference in returns (3-months deferred minus front) is positive for each sector. Of note is the degree of variation across sectors—with the highest impact in energy and livestock and minimal impact in precious metals. An extended discussion of sector performance and asset allocation is available in the prior publication, [Examining sector characteristics and asset allocation](#) (Nov 2019).

Investment universe

We use a universe of 26 commodities spanning five sectors:

- **Energy:** Natural Gas, Brent, WTI, Heating Oil, Gasoline/Unleaded, Gasoil
- **Precious Metals:** Gold, Silver
- **Industrial Metals:** Aluminum, US Copper, Nickel, Lead, Zinc, Tin
- **Agriculture:** Soybean, Soybean Oil, Soybean Meal, Wheat, Kansas Wheat, Corn, Sugar, Cotton, Coffee
- **Livestock:** Lean Hogs, Live Cattle, Feeder Cattle

A constant source of concern for commodity investors seeking to deviate from traditional benchmark weights is investment capacity, by which traders mean the requirement to not exceed a certain percentage of average daily volume on the exchange (in order to minimize price impact when transacting). Weighting commodities by volume traded—i.e. liquidity—would directly address these capacity concerns. Two questions that naturally arise are:

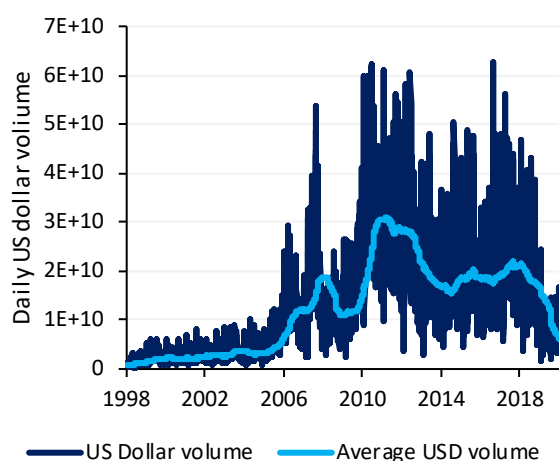
1. What is a sensible measure of liquidity that is minimally parameterized?
2. Does this weighting scheme in any way reflect economic importance?

Measuring liquidity

Since contract sizes vary both in units and size, we use the concept of US dollar volume traded per day as the measure of liquidity which, for a particular calendar contract, is simply the number of contracts traded multiplied by the contract value. Historical data indicates approximately 70-90% of US dollar volume is captured by the first four futures contracts. Accordingly, we sum multiple contracts towards the front of the curve to construct an aggregate measure of liquidity.

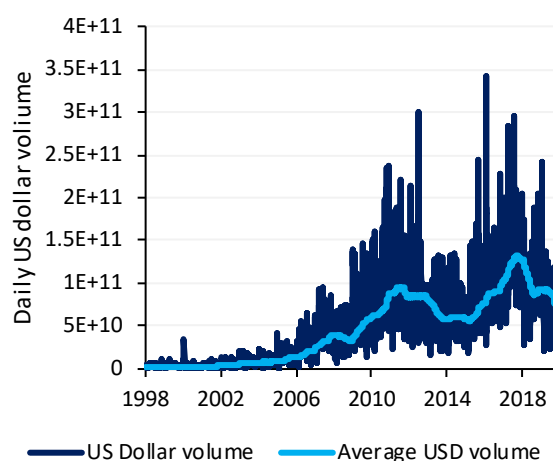
Daily liquidity varies considerably as illustrated in Figures 11 and 12. Consequently, daily data is too noisy to weight commodities. As we see, a simple average over a fixed lookback window provides considerable smoothing while maintaining the broad pattern of liquidity changes.

Figure 11: US dollar liquidity: Corn (1998 – Mar 2021)



Source: Bloomberg

Figure 12: US dollar liquidity: Gold (1998 – Mar 2021)



Source: Bloomberg

The length of the lookback window is a trade-off between (1) reactivity to changes in relative trading patterns between commodities, (2) the risk of mis-forecasting volume over the subsequent period and (3) portfolio turnover during the portfolio rebalance. It is also a function of the rebalancing frequency of the portfolio. In the case of long-only benchmark investors that are sensitive to cost, require large capacity and rebalance infrequently, a multi-year average will likely be attractive. In this analysis we use a three-year window.

Interpreting liquidity weights

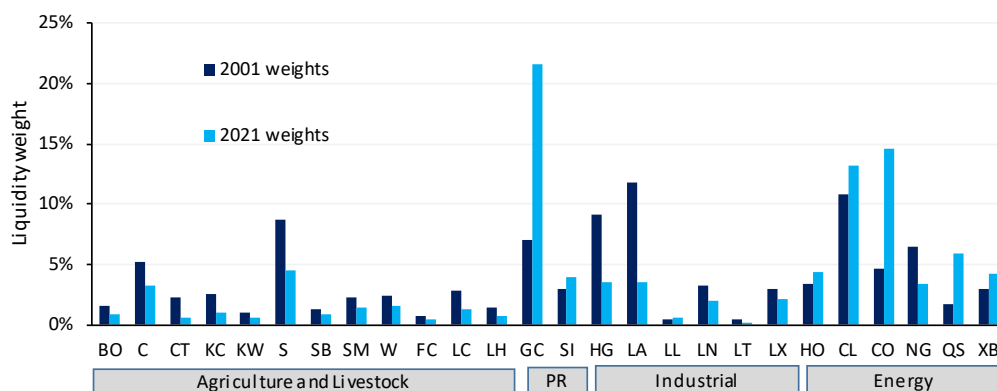
To access the traditional properties outlined in the section above, weights in a broad-based benchmark should reflect both the economic value of the included commodities and the investment capacity that can be sustained.

Since producers and consumers (collectively called “hedgers”) actively use commodities futures to manage the price risk related to their businesses, the US dollar volume of those commodities futures reflects the value of the individual commodities in the supply chain. This can be seen from the Commodity Futures Trading Commission’s ‘Commitment of Traders’ (COT) reports in which the hedgers can be seen to comprise a significant proportion of overall position size. Accordingly, using liquidity as a means of weighting will tend to represent the relative economic value of the relevant commodities. The total volume traded is a combination of hedgers, broker/dealers, and investors. The broker/dealers and investors (data also provided per commodity in the COT report) can be viewed as liquidity providers.

Historical allocations

Beginning in February 2001, we calculate liquidity weights using the three-year lookback window. The changing pattern of commodities trading is captured by the snapshot of weights calculated for early in 2001 and December 2021 (Figure 13). Of note is the increase in Gold and WTI weights and the decrease in US Copper, Aluminum and Soybean weights.

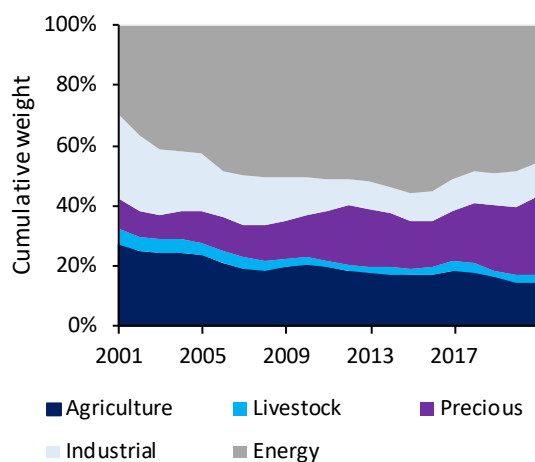
Figure 13: Significant changes in volume-based weights between 2001 and 2021



Source: Bloomberg

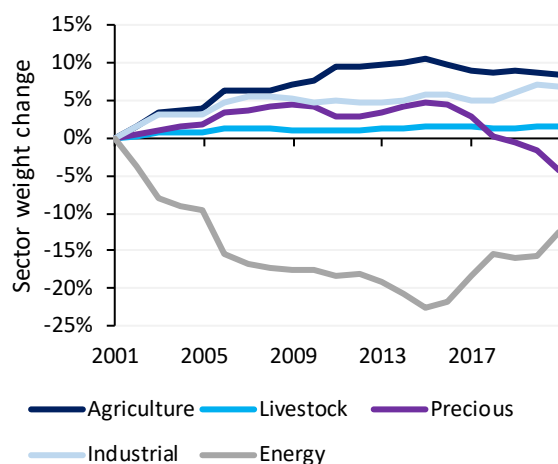
As we can see from the sector weights (Figure 14) there is a considerable amount of time variation. In particular, we can see an increase in allocations to Energy and Precious Metals and a corresponding decline in Industrial Metals and Agriculture, consistent with the results in Figure 13. Given sectors correlations are modest and there are idiosyncratic risk factors associated with single commodities, maintaining diversification is important.

Figure 14: Sector weights drift over time (Feb 2001 – Mar 2021)



Source: Bloomberg

Figure 15: Impact of diversification (Feb 2001 – Mar 2021)



Source: Bloomberg

A good example is the impact on the energy sector during the early months of the COVID-19 pandemic. Accordingly, weight caps can be imposed on a commodity and sector basis. As an example, sectors can be restricted to 33% with a lower threshold for single commodities. This results in a reapportioning of weight between commodities and sectors as seen in Figure 15—which maps the under/overweighting by sector after applying the exposure caps. Unsurprisingly, the largest underweight is to the energy sector, with the bulk of the excess weight from the energy sector redistributed to the agricultural sector.

Liquidity-based portfolios

Based on the two weighting procedures outlined above, we construct excess return portfolios to assess performance. Following in the footsteps of the BCOM index, both portfolio weight determinations and notional (re)allocations are carried out annually. We use the BCOM front-month single commodity excess return indices as the investible building block of the portfolio. These can be found on the Bloomberg Terminal and are given by 'BCOM' followed by the two-letter commodity code. The contract underlying each of the commodities at any given time can be found using [BCOM Index MEMB <GO>](#). To facilitate replicability, we introduce an appropriate lag between weight determinations and rebalance dates.

All the subsequent analysis and performance discussions in this publication are in excess return terms. Also note that in the case where annualized returns are negative, we do not calculate the associated value for the Sharpe ratio.

Figure 16: Comparing performance: Measuring the impact of diversification

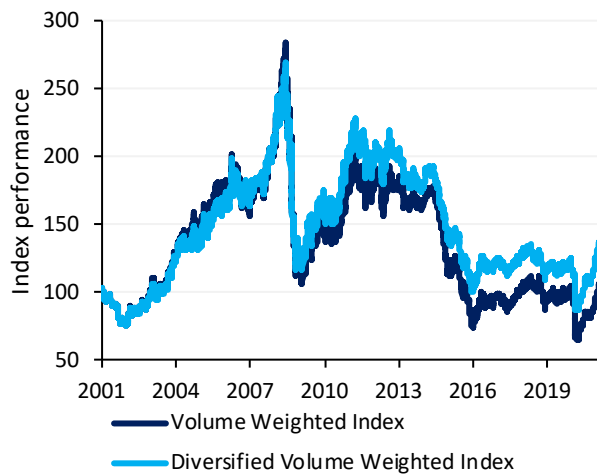
	Volume Weighted Index	Diversified Volume Weighted Index
Full sample (Feb 2001 – Mar 2021)		
Ann return	0.0%	1.3%
Volatility	18.7%	16.6%
Sharpe ratio	NA	0.08
Drawdown	-77%	-68%
Skew	-0.72	-0.68
1st half (Feb 2001 – 2010)		
Ann return	6.0%	7.4%
Volatility	19.6%	17.9%
Sharpe ratio	0.31	0.41
2nd half (2011 – Mar 2021)		
Ann return	-5.5%	-4.2%
Volatility	17.8%	15.2%
Sharpe ratio	NA	NA
Since 2020		
Ann return	-2.1%	4.7%
Volatility	27.7%	23.1%
Sharpe ratio	NA	0.20

Source: Bloomberg

The portfolio corresponding to the liquidity weights is referred to from here onwards as the "Volume Weighted Index" and the portfolio based on incorporating the diversification criteria is referred to as the "Diversified Volume Weighted Index". The summary performance statistics of the two portfolios are shown in Figure 16. The portfolio incorporating the diversification step displays both an improvement in returns (0% versus 1.3% p.a.) and a lowering of volatility (18.7% versus 16.6% p.a.). The outperformance is consistent over the different sub-periods and is most striking during the COVID-19 pandemic began in 2020 when the diversified portfolio gained 4.7% p.a.

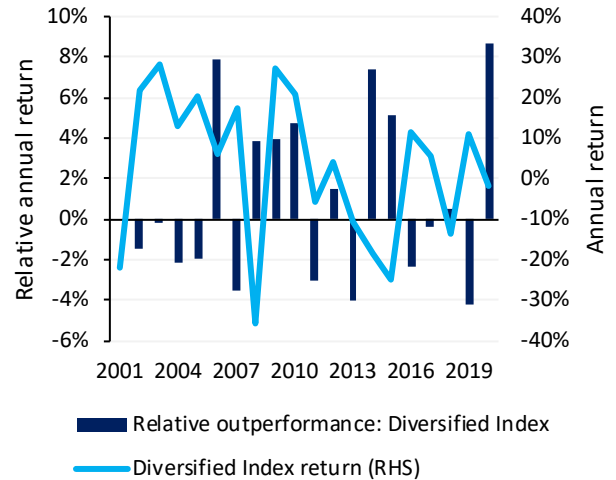
compared to a decline of 2.1% for the (solely) liquidity weighted portfolio. The benefits of diversification also extend to improving the downside risk characteristics of the portfolio as can be seen via the drawdown reduction of 9% p.a.

Figure 17: Comparing indexed returns (Feb 2001 – March 2021)



Source: Bloomberg

Figure 18: Diversification protects in falling markets (Feb 2001 – Mar 2001)



Source: Bloomberg

As we can see in Figure 17, the two portfolios' returns display a high correlation (0.98). However, annual returns reveal that balancing sector allocations helps mitigate weak performance during adverse market conditions (Figure 18). The left-hand axis charts the outperformance of the Diversified Volume Weighted Index versus the Volume Weighted Index. The right-hand axis maps the (raw) return of the Diversified Volume Weighted Index. As can be seen, the relative outperformance tends to occur during periods when commodity markets deliver weak/negative returns.

Incorporating the carry premium

Carry is a yield accrual strategy. The typical pay-off profile is one where the investor collects a steady premium over extended periods in exchange for taking-on the risk of a large, sudden drawdown (commonly referred to as "crash risk"). Given the multiplicity of liquid calendar contracts per commodity, the commodities carry trade comprises of two strategies that both rely on maximizing roll yield. For long-only investors, this can be interpreted as:

1. **Curve strategy:** Contract selection based on differences in the local curvature of each commodities futures' curve (as measured by successive futures contract prices); and
2. **Backwardation strategy:** Involves under/overweighting commodities based on differences in the steepness of futures curves across commodities at any point in time.

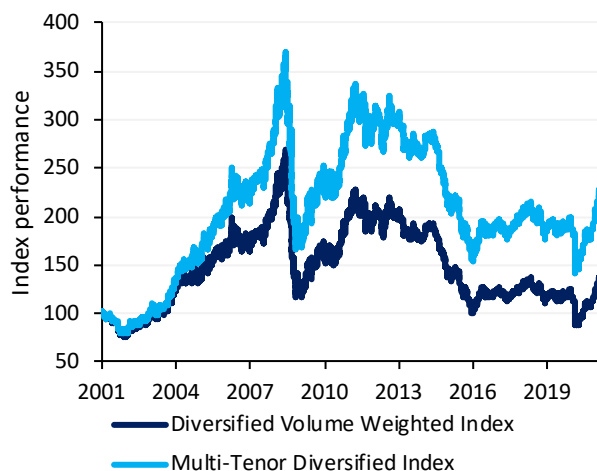
The risk event for investors in the carry trade is a disruption to the shape of the futures curve due to demand/supply shocks.

Accounting for the curve returns

On a per commodity basis, an implementation of a curve strategy is to invest in the futures contract that corresponds to the localized slope displaying the most backwardation. However, this can be problematic both from a turnover and a capacity/liquidity perspective (the rank ordering of localised slopes can change frequently and 70-90% of liquidity—as measured by volume traded—is concentrated in the first four contracts on the curve). Instead, we adopt a more passive approach based on the historical pattern of commodity slopes. Since 2001, with a few exceptions, curves have been in contango for a majority of days (Figure 9). When in contango, the roll return at a deferred point is less negative due to the typical shape of the curve (concave). For a long-only investor holding a diversified basket of commodities, an allocation to multiple contracts towards the front and middle of the curve will result, in the longer run, in a lower negative roll return compared to an investment solely in the front contract.

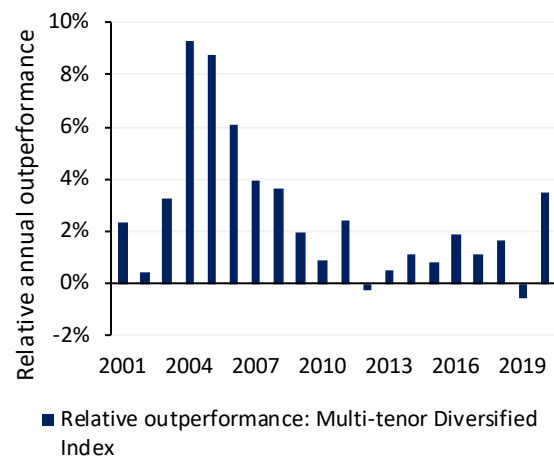
Since the number of calendar contracts vary by commodity, we consider holding a fixed number of contracts per commodity instead of only the front contract as per the previous section. For example, this could be an equal-weighted allocation, rebalanced monthly, to the first three to four contracts along the curve. Compared to investing in a single deferred point on the curve, this potentially reduces the portfolio's monthly roll cost. The distribution of the notional allocation across multiple contracts reduces the likelihood of hitting capacity constraints on deferred contracts.

Figure 19: Impact of investing in deferred contracts (Feb 2001 – March 2021)



Source: Bloomberg

Figure 20: The annual curve premium (Feb 2001 - 2020)



Source: Bloomberg

To assess the impact of adding the curve premium, we maintain the same commodity weighting scheme as used by the Diversified Volume Weighted Index but replace the allocation to the front contract by a basket comprising of front and deferred contracts. Effectively, we construct an excess return portfolio per commodity. For simplicity and to manage capacity, we allocate equal notional to each contract within this basket and rebalance the basket on a monthly frequency. The impact of incorporating the curve premium is clear to see from Figure 19 which illustrates a significant performance pickup of the Multi-Tenor Diversified Index relative to the Diversified Volume Weighted Index. The Multi-Tenor Diversified Index outperformed the Diversified Volume Weighted Index in all but two years since 2001, with an average excess return (over the Diversified Volume Weighted Index) of 2.6% p.a. (Figure 20).

Accounting for backwardation

The large dispersion in slopes across commodities and sectors (Figure 7-9) suggests the possibility of additional roll returns by over/underweighting commodities. To achieve this, we need to construct a relative (slope) scoring measures across commodities and translate this into tilts from a benchmark allocation.

Long/short backwardation strategies constructed as per the typical alternative risk premia implementations tend to rebalance positions on a weekly or monthly frequency. This responsiveness to changes in relative slopes is important for two key reasons:

1. Since the roll return is directly linked to futures prices, demand/supply dynamics that lead to a decline in prices tend to reduce (increase) backwardation (contango)—which in turn decreases the amount of available roll return; and
2. Seasonality effects can impact the relative ranking of slopes.

For portfolios with lower rebalance frequencies—more in-line with traditional benchmarks—it might be advantageous to use a moving average measure (similar to what is used for the liquidity weights) to negate seasonal effects and identify commodities with persistently steep slopes due to structural factors (Figures 7 and 8). In step with the prior sections, commodity weights are recalculated annually.

On a given day t , the three-stage process is:

1. Using a fixed lookback window, calculate the average slope per commodity. Given the annual rebalance frequency and to maintain consistency with the liquidity weighting process, we use a three-year window.
2. Normalize each of the 26 commodities' average slopes based on the cross-section of slopes—resulting in slope scores ranging from 0 to 1.
3. For each commodity i , the slope score is then combined multiplicatively with the commodity weight calculated as part of the Diversified Volume Weighted Index to produce the backwardation adjusted weight (ω'):

$$\omega'_i = \frac{f(\omega_i, \sigma_i, \beta)}{\sum_i f(\omega_i, \sigma_i, \beta)}$$

where ω is the diversified weight, σ is the slope score and β is a scaling parameter ($\beta \geq 0$) that determines the sensitivity of the backwardation adjusted weights to the slope scores. Setting β to 0 results in the diversified weight.

Introducing the new benchmark

In the sections above we discussed constructing a liquidity measure, diversifying exposures to benefit from sector correlations and incorporating two forms of carry available to commodities investors. We combine these four aspects to construct the [Bloomberg Enhanced Roll Yield Excess Return Index \(BERY\)](#). In summary, the steps are:

1. **Assign weights based on a measure of liquidity**
 - US dollar volume traded
2. **Implement a diversification process**
 - Commodity and sector caps to exploit correlation structures

3. Incorporate the curve premium

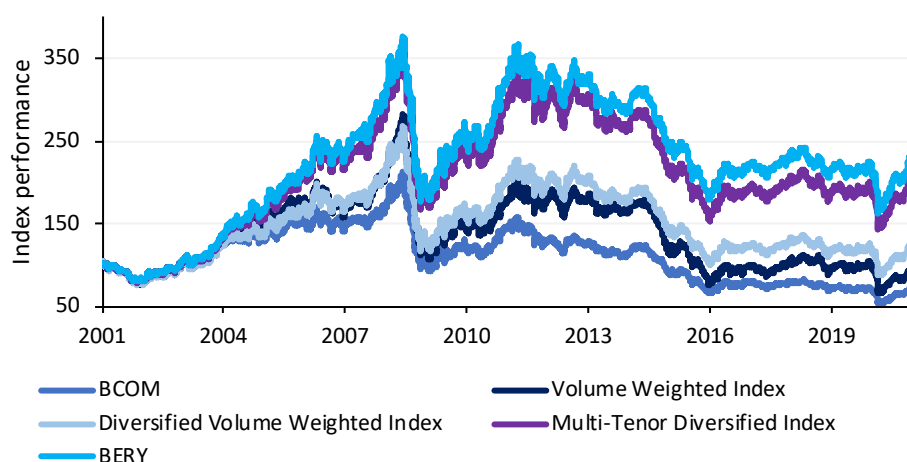
- Deferred contracts to benefit from the long-run structural shape of commodities futures curves

4. Incorporate the backwardation premium

- Under/overweight commodities based on slope differentials

To maintain the modular approach to portfolio construction, we build on the Multi-Tenor Diversified Index. The diversified liquidity weights are replaced by the backwardation adjusted weights discussed in the subsection above. The results from the stepwise construction process can be seen in Figure 21 (BCOM is added as a reference point).

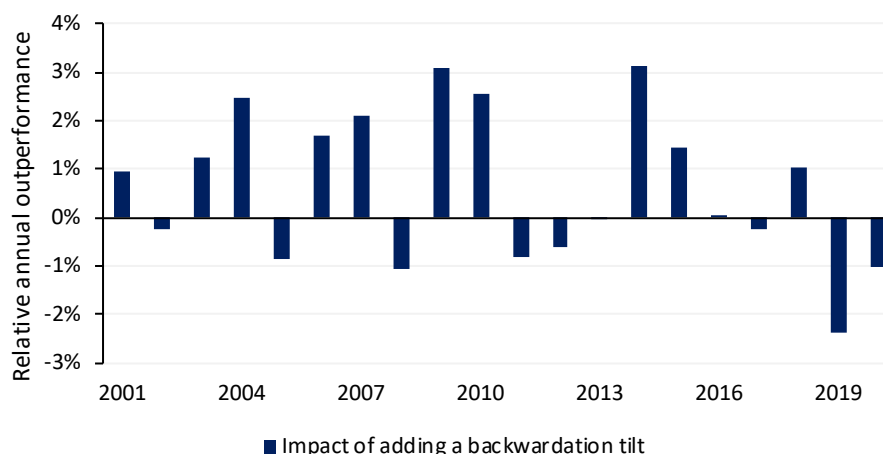
Figure 21: Mapping returns: from asset beta to enhanced beta (Feb 2001 – Mar 2021)



Source: Bloomberg

We can isolate the results of tilting on the slope measure (backwardation) by subtracting the Multi-Tenor Diversified Index returns from BERY returns (Figure 22). The annual returns profile indicates a steady accrual of returns with intermittent losses until 2020—when the COVID-19 pandemic meant the materialization of a large risk event—namely the large decline in energy prices.

Figure 22: Impact of backwardation tilts (Feb 2001 - 2020)



Source: Bloomberg

The performance statistics (Figure 23) suggest the introduction of the curve premium has a large impact on returns (1.3% versus 3.9% p.a.) while the addition of the backwardation premium serves to further enhance returns (3.9% versus 4.4%) and dampen volatility.

Figure 23: Stepwise progression: From diversification to carry

	Diversified Volume Weighted Index	Multi-Tenor Diversified Index	BERY Index
Full sample (Feb 2001 – Mar 2021)			
Ann return	1.3%	3.9%	4.5%
Volatility	16.6%	16.2%	15.5%
Sharpe ratio	0.08	0.24	0.29
Drawdown	-68%	-62%	-57%
Skew	-0.68	-0.67	-0.69
1st half (Feb 2001 – 2010)			
Ann return	7.4%	11.5%	12.6%
Volatility	17.9%	17.5%	17.1%
Sharpe ratio	0.41	0.66	0.74
2nd half (2011 – Mar 2021)			
Ann return	-4.2%	-3.0%	-2.9%
Volatility	15.2%	14.7%	13.6%
Sharpe ratio	NA	NA	NA
Since 2020			
Ann return	4.7%	7.7%	6.4%
Volatility	23.1%	21.6%	20.2%
Sharpe ratio	0.20	0.36	0.31

Source: Bloomberg

Revisiting inflation and liquidity

Commodities futures curves tend towards a state of (higher) backwardation when supply/inventory shortages drive spot market prices higher. This suggests incorporating a backwardation tilt could potentially increase the sensitivity to changes in inflation. Over the period Feb 2001 – Mar 2021, regressing monthly returns for BERY on changes in CPI results in a statistically significant coefficient of 3.5 (t-stat of 4.8). This compares with a coefficient of 3.1 for BCOM and indicates BERY does have a higher sensitivity to inflation.

Broad commodity benchmarks roll their open positions over a pre-defined window. Over this period, while liquidity is high, the demand/supply dynamics for current-and-next contracts can impact index returns. BERY has an extended roll window in an attempt to benefit from increased liquidity during the BCOM roll window while taking advantage of more balanced buying and selling pressure on the remaining days.

Conclusion

We outline a rules-based approach to developing a commodity index incorporating aspects of alternative risk premia to enhance roll yield characteristics, while continuing to provide sufficient capacity for institutional investors.

The [Bloomberg Enhanced Roll Yield Index \(BERY\)](#) can be used to hedge inflation risk and can potentially provide a source of diversified returns to multi-asset investors. The framework discussed in this publication can be used to construct customized benchmarks based on universe selection, tenor selection and sensitivity to the backwardation premium.

Appendix 1: Bloomberg Commodity Offering

The Bloomberg Enhanced Roll Yield Index is part of the wider family of commodity indices at Bloomberg. The four-part index offering is classified as below:

1. **Benchmark family**
 - Broad market indices
 - Sub-indices (e.g. single commodity and sector indices)
 - Exclusion sub-indices
 - Specialty indices (e.g. spot and currency hedged indices, Roll Select family)
 - Forward indices (e.g. BCOM 3-month Forward Index)
 - Leveraged and inverse indices
2. **Enhanced beta indices**
 - **Bloomberg Enhanced Roll Yield Index**
3. **UBS Bloomberg CMCI Index family**
 - Broad market, multi-contract, constant maturity indices
4. **Bloomberg GSAM Risk Premia Indices**
 - Commodity Carry and Commodity Trend

For further information, please see the following:

- Website: <https://www.bloomberg.com/professional/product/indices/>
- Bloomberg Terminal Page: [INP <GO>](#)
- Email: commodities@bloombergindices.com

Appendix 2: Bloomberg Commodity Index Research

Bloomberg clients have access to various resources:

1. [Bloomberg Index Research Portal](#)
2. [Bloomberg Commodity \(Monthly\) Outlook](#)
3. [Bloomberg Intelligence Commodity Dashboard](#)

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