Uncovering Hidden Risks in "Active" Commodity Indices

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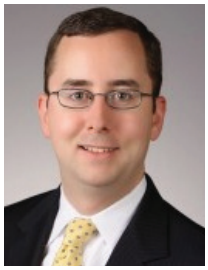

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Executive Summary

Commodity investing has evolved substantially in the last two decades. From exposure to broad-based benchmarks such as the S&P Goldman Sachs Commodity Index ("S&P GSCI") and the Dow Jones UBS Commodity Index ("DJ-UBS"), the asset class has progressed into a myriad of factor-based indices. Investors have seen a proliferation of new commodity index strategies, each with different construction methodologies and characteristics such as curve shape, momentum, volatility and particular weighting schemes. The large increase in these strategies over a relatively short period has created new challenges for investors, including choosing the appropriate benchmark, understanding the weighting methodologies and selecting the right factors.

Normally thought of as "active indices", these new methodologies seek to calibrate beta exposures based on specific quantitative or fundamental factors with the goal of generating better returns than more established benchmarks. Many of these new indices are optimized towards particular factors and events, and may not perform as well in certain market conditions. Often marketed based on back-tested analyses, these strategies can demonstrate inherent performance biases across certain time periods. For investors who are unaware of the particular tilts and biases of these new strategies, these techniques may expose commodity portfolios to unintentional risks.

As investors grapple with the challenges presented by the availability of so many new commodity indices, we believe that discretionary active management—alongside broad, passive beta exposure to the asset class—will play an increasingly important role in commodity investing going forward.

In this paper, we briefly describe how active index strategies are generally developed, review some of the typical construction methodologies and show a comparative analysis of how these indices perform over time. Specifically, the paper will:

- Describe common factors used to create active indices;
- Demonstrate how factor-based indices are backtested;
- Compare returns and volatility of factor-based indices versus arbitrarily-selected indices as well as traditional benchmarks;
- Explain how the intricacies of commodities investing present unique challenges for investors, and how they differ from other actively managed asset classes, such as equities; and
- Assess how an active/discretionary manager may provide an alternative and help manage active commodity exposure for an investor who many not be comfortable managing these risks on his or her own.

Active Management in Commodities

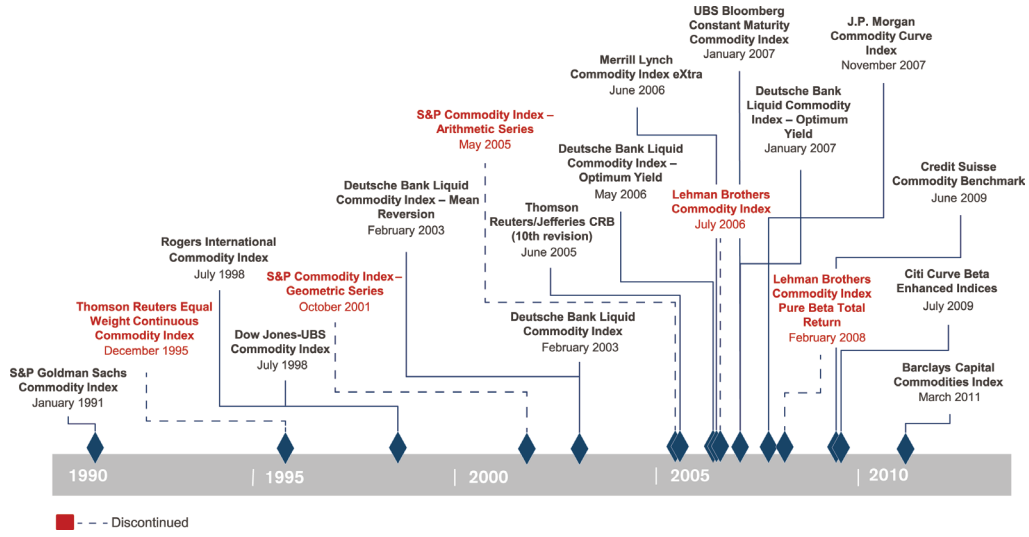
Commodity indices have been available to investors for more than two decades. In the 1990s, the earliest broadly accepted investable commodity indices, the S&P GSCI and the DJ-UBS, were created to provide investors with diversified access to commodity futures as an asset class. While these broad-based benchmarks offered investors efficient beta exposure, an investor who desired additional active returns beyond commodities beta would typically turn to an investment manager to try to achieve the desired alpha.

During the 2000s, many firms developed their own proprietary brands of commodity indices designed to provide beta exposure to the asset class *(Display 1)*. Each had a slightly different construction methodology versus existing commodity indices and often provided a differentiating feature such as a special weighting methodology or roll mechanism. In addition to their own brand of broad beta-oriented indices, many of these same firms focused on more factor-based components—for example, algorithms relating to momentum or curve shape—to develop new indices that historically outperformed when these factors did well. These alternative factor-based indices are often thought of as "active" indices; similar to an investment manager, they seek to generate a tracking error and active returns relative to broad-based beta commodity benchmarks.

The significant increase in the number of commodity indices available in the market has created some confusion for commodity investors, many whom may not be fully aware of the differences between the indices and the factor bets that may be embedded within their construction process. There has even been some blurring of the line between broad beta indices and factor-based indices, as some beta indices have introduced components that might also fit into factor-based benchmarks. For example, some broad-based benchmarks such as the S&P GSCI now have variant methodologies with contract selection based on market-driven factors rather than on a set schedule. The roll schedule in the S&P GSCI Enhanced Index adjusts the roll schedule for WTI and Brent Crude Oil based on the shape of the forward curve. Regardless of classification, beta- or factor-based, in recent years these "active" indices (relative to investors' traditional benchmarks), as well as active commodity managers, have been in greater demand as investors seek additional alpha from the asset class.

In traditional equity and fixed income management, the vast majority of investors hire investment managers when there is a desire for active management. However, in commodities, Credit Suisse has found the approach to active management rather unique. That is, commodity investors sometimes consider alternative commodity indices as a substitute for actively managed commodities exposure. Overall, we believe that commodity investors typically consider both investment managers and non-traditional commodity indices as producers of "active" returns.

Display 1: The number of "Active" indices has seen an increase in recent years



Source: Credit Suisse Asset Management, Bloomberg; All data was obtained from publicly available information, internally developed data and other third party sources believed to be reliable. Credit Suisse has not sought to independently verify information obtained from public and third party sources and makes no representations or warranties as to accuracy, completeness or reliability of such information.

Comparing Equity and Commodity Indices

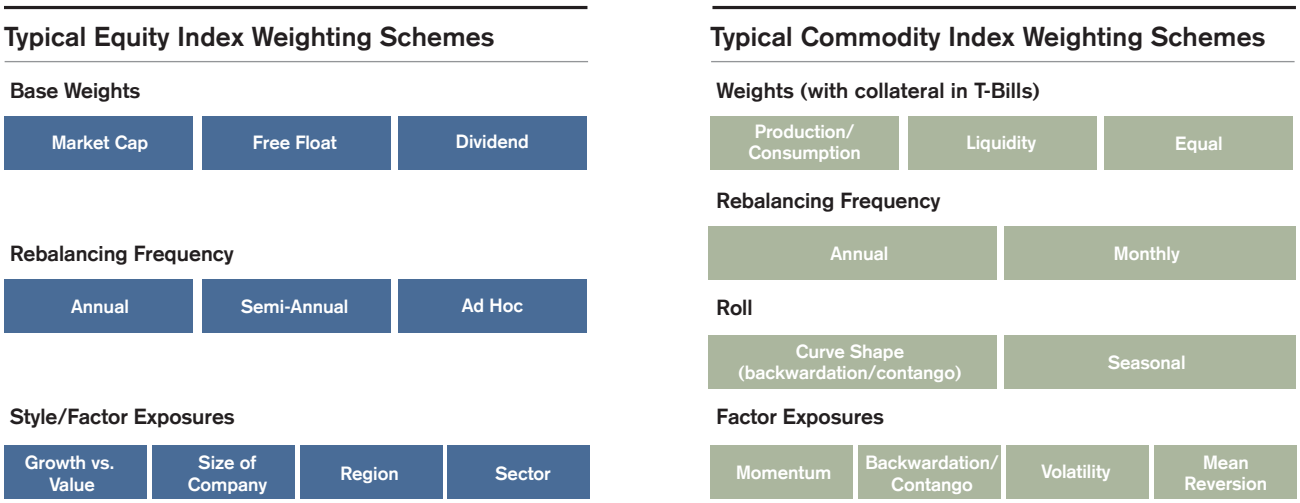
There is a variety of equity indices for investors to consider when selecting exposure to the asset class. Equity indices are generally broken out by their construction methodology (e.g., market capitalization weighted versus equally weighted), style (large versus small capitalization, value versus growth), or region (US, Emerging Markets, etc.). Outperformance of one equity benchmark versus another can usually be isolated to security selection and or sector/style rotation. Similar to equity indices, commodity indices can be broken down by weight and factor exposure, and offer different rebalancing frequencies. Some of the most common differentiating characteristics are weighting methodologies based on economic significance (e.g., average world production or consumption), liquidity, momentum, curve shape and volatility *(Display 2).*

However, commodity indices offer additional opportunities for differentiated construction processes relative to equity indices, because these benchmarks reference commodity futures, which have fixed maturity dates. Prior to maturity of a commodity contract within an index, there is on-going maintenance that assumes the index will passively sell the expiring contract, and a new maturity contract is simultaneously purchased. This is known as the "roll" process. Traditional commodity benchmarks such as the DJ-UBS and the S&P GSCI have established criteria as to when to roll and which contract to roll into. As a result, contract maturity selection within certain recent commodity indices can be a source of differentiation. As an example, during the roll process, some new indices can specify which contract maturity to purchase based on the shape of the curve or seasonality.

This roll process also ensures higher turnover when compared to equity indices. With higher turnover embedded into the index process, this also introduces opportunities to adjust the portfolio weightings. This could include algorithm-driven construction methodologies with regard to the individual commodity weights or to futures curve positioning. Equity indices, typically with lower rebalancing frequencies, provide fewer opportunities for potential weight changes and do not have the added dimension of curve positioning. *Display 2* compares and contrasts the construction methodologies between equity and commodity indices.

Generally, when investors think about investing in equities, they make a conscious effort to invest in growth stocks versus value stocks, US equities versus global equities or small versus large capitalization stocks. This decision may be based on their views on the market or an optimal portfolio asset allocation. With commodities, this not always the case. For example, while commodities indices can offer a variety of factor exposures, investors may not differentiate between investing in momentum indices or backwardated commodities. However, with the universe of commodities indices being relatively small, we believe that most investors should consider exposures when selecting commodity indices and factors which are in line with their view of the current market environment.

Display 2: Selecting factor exposure in commodities is as critical as it is in equities



Source: Credit Suisse Asset Management

Analyzing Factor-Based Commodity Indices

All of the commodity indices included in *Display 1* are beta-oriented and are designed to provide broad exposure to the commodity market. With so many commodity beta indices available in the market, index providers have been seeking alternatives to differentiate from each other. In an attempt to come up with different ways to outperform traditional commodity indices, firms have introduced methodologies to mechanically place bets on factors. Factors can include price momentum and trends (similar to a CTA or managed futures strategy) or the amount of backwardation or contango an individual commodity exhibits. The resulting index could be beta-oriented and tilted to perform well when a particular factor has strong performance or could be absolute return-oriented and focused strictly on that factor.

While any individual factor may be a valuable cross-sectional predictor of returns over any given period, it may often not be the case during other periods. To highlight this point, we have used the Deutsche Bank Commodity Index family of indices and compared the performance of these different factor-based indices between the following time periods: 1992-2004 and 2004-2009 *(Display 3)*.

These alpha-oriented indices are examined to isolate the key factor within each index. This comparison demonstrates that sometimes these factors help performance while other times they do not. An investor who could accurately time the different factors could achieve a higher return than one who held the same factor throughout the same period.

Display 3: Index performance can differ sharply depending on which factor it follows

Index	Definition	Annualized return 12/31/1992 – 12/31/2004	Annualized return 12/31/2004 – 12/31/2009
Deutsche Bank Commodity Booster – Benchmark TR	A beta index which uses roll yield factor	17.80%	5.78%
Deutsche Bank Liquid Commodity Index – Mean Reversion Enhanced Index	A beta index which uses mean reversion and backwardation/contango factors	11.00%	12.75%
Deutsche Bank Commodity Harvest – S&P GSCI TM ER	An alpha index which uses roll yield factor	5.11%	10.95%
Deutsche Bank Commodity Trend ER Index	An alpha index which uses momentum and backwardation/ contango factors	10.53%	11.71%

Source: Credit Suisse Asset Management

The Search for the "Right" Index: How to Evaluate Potential Bias

Factor-based indices may exhibit a backtesting bias, and it is important to understand what types of risks are embedded within their construction. In order to understand the potential biases embedded in "active" commodity indices, we established the following framework to analyze them:

1. Create a custom benchmark that weights individual commodities based on a static methodology unrelated to commodity fundamentals;
2. Compare the custom benchmark to both established, broad-based commodity indices as well as to an equal-weighted benchmark; and
3. Add additional "factor" exposures to our custom benchmark to test the impact of alternative index-construction methodologies.

The base construction process for this analysis assigned weights to each commodity based on the number of letters in the first word of the commodity's name. Thus, Natural Gas, with seven letters in the first word of the name, had a weight of seven, and WTI Crude Oil, with three letters in the first word of the name, received a weight of three. We called this the Credit Suisse Custom "A" Benchmark. This benchmark reset to the same target weights on an annual basis and rolled futures exposure monthly, similar to the DJ-UBS and S&P GSCI indices *(Display 4, next page)*. While the construction methodology may appear odd, this was purposely done to highlight the potential problems of making investment decisions based on historical back-testing and optimization, and mistaking randomness for alpha.

We compared the performance and volatility of the custom, static benchmark, the Credit Suisse Custom "A" Benchmark, against the DJ-UBS Index and the S&P GSCI Index across four distinct time periods. Then, in order to test the impact of alternative construction methodologies, we re-ran the analysis on the Credit Suisse Custom "A" Benchmark and introduced three popular factor-based exposures:

1. Monthly rebalancing
2. Alternative forward curve positioning
3. Reduced Natural Gas exposure

Display 4: Creating a custom benchmark based on static methodology

Weighting Methodology	Based on a consistent characteristic for each commodity to deliver a consistent commodity weight
Notable Weights	Highest weight: 7.3% for Aluminum Lowest weight: 2.8% for WTI Crude Oil
Reweighting Frequency	Annual
Rebalancing Frequency	Annual
Roll Period	20% per day from business days 5 through 9
Number of Commodities	20

Source: Credit Suisse Asset Management. Please see important information regarding hypothetical, backtested and simulated performance at the end of this paper.

As one can see from *Display 5*, the initial hypothetical results of the Credit Suisse Custom "A" Benchmark produced better returns than the DJ-UBS Index and the S&P GSCI Index across most time periods, and had slightly lower volatility than these other indices. However, when an additional factor was added (particularly, the forward curve and reduced Natural Gas exposure), the hypothetical returns became significantly better during most of the periods. It is notable that the monthly rebalancing detracted from performance over the full period but added value over the most recent period. This arbitrary index construction process coupled with the addition of popular factor-based exposures highlight outperformance over the standard benchmark. Therefore, it is critical for investors to understand the weighting methodology for each commodity index along with the factors being introduced into the selected index.

Display 5: Annualized total returns and volatility of DJ-UBS and S&P GSCI as well as Credit Suisse Custom "A" Benchmark and its derivatives

	12/31/1992 – 12/31/1997		12/31/1997 – 12/31/2001		12/31/2001 – 6/30/2012		Total (12/31/1992 – 6/30/2012)	
	Annualized Returns	Volatility[3]	Annualized Returns	Volatility[3]	Annualized Returns	Volatility[3]	Annualized Returns	Volatility[3]
DJ-UBS TR	9.60%	7.96%	-0.94%	15.66%	5.92%	18.25%	5.39%	15.65%
S&P GSCI TR	5.03%	13.16%	-1.98%	22.47%	4.61%	25.00%	3.33%	21.95%
Equal-Weighted Custom Benchmark[1]	10.84%	7.98%	-1.03%	14.12%	8.61%	17.64%	7.11%	14.99%
Credit Suisse Custom "A" Benchmark[2]	11.12%	8.43%	-1.14%	14.42%	8.57%	17.97%	7.14%	15.32%
Adjusted for Monthly Rebalancing	10.23%	7.69%	-4.26%	13.24%	8.31%	17.53%	6.08%	14.75%
Adjusted for longer forward curve exposure	12.26%	6.91%	-0.11%	12.24%	13.87%	17.51%	10.45%	14.46%
Adjusted for reduced Natural Gas	11.37%	8.18%	-3.02%	13.04%	9.98%	17.83%	7.52%	14.98%
Adjusted for all three	10.79%	6.67%	-2.61%	11.23%	14.48%	17.16%	9.82%	14.08%

Source: Credit Suisse Asset Management. Please see important information regarding hypothetical, backtested and simulated performance at the end of this paper.

(1) The equal weighted benchmark includes a universe of 20 commodities across all 5 sectors, and is annually rebalanced to an equal weight (5%) for each commodity at the beginning of the year.

(2) The static methodology is comprised of 20 commodities across all 5 sectors and involves weighting each commodity by the number of characters in the first word of the commodity. For example, WTI Crude Oil receives a weight of 3, while Natural Gas is a weight of 7. The index is re-weighted and rebalanced annually.

(3) Volatility is annualized using monthly returns.

Commodity Indices and Backtesting Bias

Many of the current commodity indices available in the market have some backtesting biases. In order to provide additional contrast to our initial analysis and further explore the impact of backtesting bias in commodity indices, we then constructed four benchmarks from a weight-based optimization that solely seeks to maximize the return profile during specific time periods (in-sample testing). Time periods were selected based on market cycles—we looked at the last two decades, divided them into four distinct market cycles and optimized returns for each of the four cycles. These benchmarks were rebalanced annually. As an example, if there was a period in which Energy performed well relative to the other commodity sectors, the backtest would overweight Energy. Conversely, if there was a period in which metals were performing poorly, the backtest would underweight metals for that period. Twenty commodities were included in the benchmark. At the beginning of each period, the minimum weight per commodity was 2% while the maximum weight per commodity was 15%. We then measured the performance of those same benchmarks during other time periods (out-of-sample testing).

The first benchmark was designed to maximize returns during the 1992-1997 period (the "'92-'97 Benchmark"). During that optimization period, the '92-'97 Benchmark outperformed the Credit Suisse Custom "A" Benchmark and the Equal-Weighted Custom Benchmark by 6.91% and 7.19% per annum, respectively. Since then, the return profile has been very different. After the optimization period beginning in 1998, the '92-'97 Benchmark lagged the Credit Suisse Custom "A" Benchmark and the Equal-Weighted Custom Benchmark by -0.65% and -0.71% per annum, respectively. However, the '92-'97 Benchmark outperformed the two other benchmarks on an aggregate basis because of the historical backtesting bias *(Display 6a).*

Using the same methodology described above, we created additional backtested benchmarks to maximize returns for 1997–2001 (the "'97-'01 Benchmark") *(Display 6b)*, 2001-mid 2008 (the "'01-'08 Benchmark") *(Display 6c)* and mid-2008-mid-2012 (the "'08-'12 Benchmark") *(Display 6d)*.

Display 6a: Performance of '92-'97 Benchmark versus Credit Suisse Custom "A" Benchmark and Equal-Weighted Custom Benchmark (12/31/1992 – 6/30/2012)

	Maximum Optimization Period (12/31/1992 – 12/31/1997)		After Maximum Optimization Period (12/31/1997 – 6/30/2012)		Full Testing Period (12/31/1992 – 6/30/2012)	
	Annualized Return	Volatility	Annualized Return	Volatility	Annualized Return	Volatility
'92-'97 Benchmark	18.03%	13.03%	5.15%	18.13%	8.31%	17.00%
Credit Suisse Custom "A" Benchmark	11.12%	8.43%	5.80%	17.07%	7.14%	15.32%
Equal-Weighted Custom Benchmark	10.84%	7.98%	5.86%	16.75%	7.11%	14.99%

Source: Credit Suisse Asset Management. This display contains hypothetical and backtested information. Please see important information regarding hypothetical, backtested and simulated performance at the end of this paper.

Display 6b: Performance of '97-'01 Benchmark versus Credit Suisse Custom "A" Benchmark and Equal-Weighted Custom Benchmark (12/31/1992 – 6/30/2012)

	Before (12/31/1992 – 12/31/1997)		Maximum Optimization Period (12/31/1997 – 12/31/2001)		After Maximum Optimization Period (12/31/2001 – 6/30/2012)		Full Testing Period (12/31/1992 – 6/30/2012)	
	Annualized Return	Volatility	Annualized Return	Volatility	Annualized Return	Volatility	Annualized Return	Volatility
'97-'01 Benchmark	9.91%	8.53%	4.18%	18.23%	13.76%	20.16%	10.74%	17.46%
Credit Suisse Custom "A" Benchmark	11.12%	8.43%	-1.14%	14.42%	8.57%	17.97%	7.14%	15.32%
Equal-Weighted Custom Benchmark	10.84%	7.98%	-1.03%	14.12%	8.61%	17.64%	7.11%	14.99%

Source: Credit Suisse Asset Management. This display contains hypothetical and backtested information. Please see important information regarding hypothetical, backtested and simulated performance at the end of this paper.

Display 6c: Performance of '01-'08 Benchmark versus Credit Suisse Custom "A" Benchmark and Equal-Weighted Custom Benchmark (12/31/1992 – 6/30/2012)

	Before (12/31/1992 – 12/31/2001)		Maximum Optimization Period (12/31/2001 – 6/30/2008)		After Maximum Optimization Period (6/30/2008 – 6/30/2012)		Full Testing Period (12/31/1992 – 6/30/2012)	
	Annualized Return	Volatility	Annualized Return	Volatility	Annualized Return	Volatility	Annualized Return	Volatility
'01-'08 Benchmark	7.33%	16.35%	32.95%	17.48%	-10.38%	26.74%	11.09%	19.60%
Credit Suisse Custom "A" Benchmark	5.49%	11.53%	20.77%	13.62%	-8.68%	22.76%	7.14%	15.32%
Equal-Weighted Custom Benchmark	5.40%	11.18%	20.32%	13.27%	-8.05%	22.49%	7.11%	14.99%

Source: Credit Suisse Asset Management. This display contains hypothetical and backtested information. Please see important information regarding hypothetical, backtested and simulated performance at the end of this paper.

Display 6d: Performance of '08-'12 Benchmark versus Credit Suisse Custom "A" Benchmark and Equal-Weighted Custom Benchmark (12/31/1992 – 6/30/2012)

	Before (12/31/1992 – 6/30/2008)		Maximum Optimization Period (6/30/2008 – 6/30/2012)		Full Testing Period (12/31/1992 – 6/30/2012)	
	Annualized Return	Volatility	Annualized Return	Volatility	Annualized Return	Volatility
'08-'12 Benchmark	11.26%	12.23%	2.76%	22.40%	9.46%	14.85%
Credit Suisse Custom "A" Benchmark	11.65%	12.58%	-8.68%	22.76%	7.14%	15.32%
Equal-Weighted Custom Benchmark	11.42%	12.22%	-8.05%	22.49%	7.11%	14.99%

Source: Credit Suisse Asset Management. This display contains hypothetical and backtested information. Please see important information regarding hypothetical, backtested and simulated performance at the end of this paper.

While in all cases, the optimized benchmarks outperformed the other benchmarks during in-sample periods, the performance was mixed during out-of-sample analysis. Within each of these benchmarks, maximizing returns during any given period led to a weightings bias towards particularly strong performers for that period. However, these particular biases may not prove sustainable over longer periods of time as demonstrated by the out-of-sample testing.

Our study showed that the four custom, backtest-biased index benchmarks outperformed the DJ-UBS, the S&P GSCI and the Equal Weighted Custom Benchmark. In-sample performance had much higher excess returns than out-of-sample performance, while out-of-sample performance was inconsistent over time. Furthermore, volatility was generally higher for the backtested benchmarks than for the Equal-Weighted Custom Benchmark across the full testing period (12/31/1992 - 6/30/2012) due to more concentrated positions. This increased level of volatility also allowed for greater returns.

Investor Considerations for Selecting Active Indices

Based on this analysis, we came to the following conclusions:

1. Factor-based indices may exhibit a backtesting bias;
2. Investors should be aware of what type of risk is embedded within this exposure;
3. Backtesting can skew performance prior to an index's "go live" date and reflect a backtesting bias;
4. Certain indices may be created to maximize their return profiles during selected backtested time periods (in-sample testing);
5. Factor tilts play a role in the performance of an index; and
6. No single factor is suitable for every market environment.

The analysis demonstrates some of the concerns around relying on backtesting to choose commodity and sector weights. Investors may not be aware of the differences between the indices nor the factor bets or weight-based decisions within the index construction processes. As we highlighted earlier, one example of a popular weight-based approach for many new beta-oriented commodity indices is through an underweight exposure to Natural Gas relative to the DJ-UBS and S&P GSCI Indices. We estimate that if the DJ-UBS Index did not include Natural Gas between 10/1/2008 and 6/30/2012, it would have outperformed the standard index by 6.58% per annum. It would have also exhibited a much better historical risk/return profile.

Without a detailed analysis of performance attribution, it may not be transparent which factor or exposure is the driver of relative outperformance. See *Display 7* below for notable biases embedded within the "Maximum Optimization" analysis from the previous section. This illustrates the importance of understanding the bets made within an algorithmic index.

In the aforementioned analysis, the only objective was to maximize returns in the in-sample periods. Any additional factors introduced into the hypothetical benchmarks were disclosed as well as those returns that were attributable to the in-sample period. However, this detail about index construction methodology and performance attribution analysis is not always readily available. It may therefore not be obvious to investors which weightings methodology and or factor tilts may be present in each index.

This brings up a variety of considerations for the average investor:

- Does the investor understand the factors embedded in returns?
- How should an investor evaluate these hypothetical indices for investment?
- Does the investor know what part of an index history is live versus backtested?
- Longer forward curve exposure and reduced Natural Gas exposure has historically added greater returns for a hypothetical investor over the backtested period, but what will happen going forward?
- What will happen in an environment when these factors do not perform well?
- Will an investor be comfortable in selecting which factors will outperform in the future?

Display 7: Commodity weights during in-sample periods fluctuate

	Equal-Weighted Benchmark	'92-'97 Benchmark	'97-'01 Benchmark	'01-'08 Benchmark	'08-'12 Benchmark
Notable Weights	5% for each commodity	Typically over 50% in energy	Typically over 60% in energy	Typically over 60% in precious and industrial metals	Typically over 50% in precious and industrial metals

Source: Credit Suisse Asset Management

Active Management as an Alternative Solution

Using an asset manager to actively manage risk while seeking alpha may be one possible solution in addressing the myriad of complexities associated with investing in this asset class. Active managers typically have defined risk and return parameters relative to the portfolio benchmark. Based on these parameters, the active manager will analyze and evaluate various factors, and budget risk to each "bet" with the goal of diversifying the risk from each strategy to potentially produce positive excess returns. Active managers can incorporate a variety of quantitative and fundamental techniques in evaluating factors, monitor markets to take into account temporary market aberrations, ensure that there is sufficient liquidity in the strategy and manage transaction and market impact costs *(Display 8).*

By hiring an active investment manager, the weight and factor selection switches from an investor decision to a manager decision. For those investors who are not comfortable choosing, monitoring and changing factor or exposure biases themselves, this may be a more attractive option. When an investor chooses an active index, he or she may bear more responsibility for performance than an investor who hires an active manager. For the investor hiring an active manager, the risk is shared between the investor and the manager. An investor using active indices should review and monitor the risks in an active index and readily adjust the strategy if the market environment changes.

It is interesting that in the commodity markets, a sizable base of investors are comfortable choosing a particular style index to tilt an exposure versus traditional benchmarks, or an algorithm to create more exposure to static or rotating factors. Compared to typical equity allocations, it would be unusual for an investor to decide that they only want Large Cap Growth equities if they have a Large Cap Core benchmark, or to choose an algorithm that rotates monthly between Growth and Value equities depending on market indicators such as dividend yield. However, this is similar to what investors have become comfortable with in the commodity market. It is our belief that while many large institutional investors may have the necessary skills, resources and risk management tools to evaluate these differences, there may be others who would benefit from an active investment manager.

Display 8: Active Management vs. "Active" Management

	Active Investment Management	"Active" Index Investment
Benchmark	Agreed with investor	Chosen by investor
Responsibility	■ Manager responsible for portfolio positioning ■ Manager responsible for updating strategy during a market regime shift	■ Investor responsible for choosing portfolio positioning ■ Investor responsible for changing index during a market regime shift
Methodology	Dynamic methodology relative to benchmark	Static methodology based on strategy rules
Flexibility	Can initiate, increase, decrease or eliminate exposures to factors	Highly dependent on a small number of factors
Availability	Dependent on strategies offered by managers or customization	Thousands of indices available from dealers
Strategy Risk Management	Manager and Investor	Investor

Source: Credit Suisse Asset Management

Fundamental and Market Factors Affecting Commodity Returns

Active managers may use quantitative techniques to model historical behaviors of commodity prices to potentially forecast future returns. Long-term commodity futures returns can be driven by supply-side fundamentals (e.g., inventories, production capacity, transportation bottlenecks), demand-side fundamentals (e.g., change in consumer preferences) or a combination thereof. Active managers can evaluate a variety of factors and will seek to select those that may be the most relevant for the current environment. This is an important difference, versus an investor passively selecting an algorithmic index, since each individual commodity market can experience cycles (e.g., low versus excess production capacity, secular demand shifts). In addition, what may have worked in the past may not work in the future.

Commodity returns can also be affected by extraneous factors that cause sudden shifts in supply and demand. This may include events that were observed during the US or European credit crisis, commercial hedging programs, changes in commodity ETF-related activity, weather-related disruptions and labor disputes. These infrequent events may not be represented well in algorithmic indices. Therefore, active managers may also consider current market conditions in their decision making process.

Evaluating Market Liquidity and Potential Transaction Costs

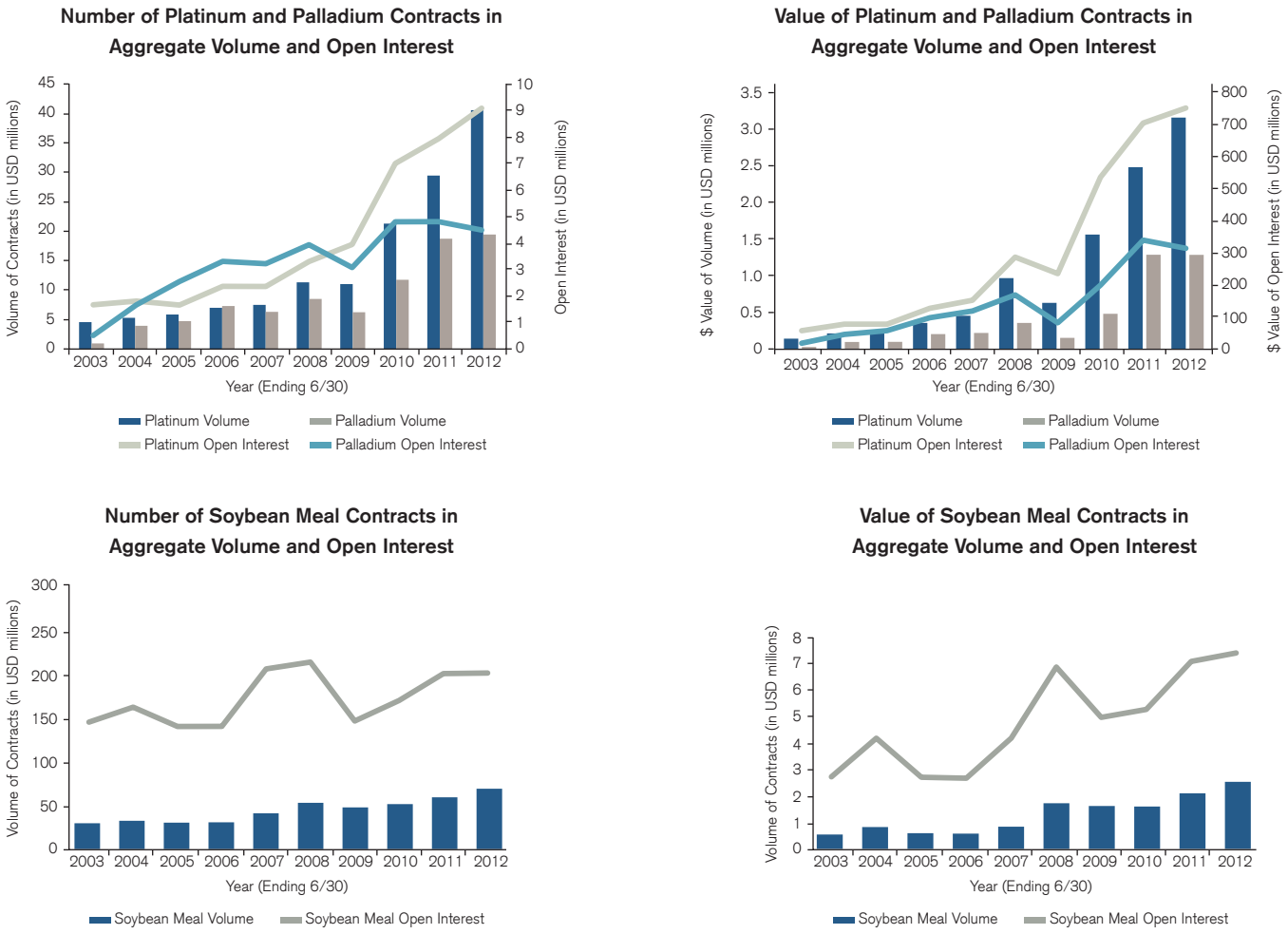
Active managers should also assess the potential transaction costs of a particular strategy or instrument before its inclusion since it may have a material impact on excess returns. In active positioning versus a traditional commodity index, a manager can use a variety of different maturities to express a view of relative performance along the term-structure. The manager may also introduce lesser-used commodities into the portfolio. While there may be a potential liquidity risk premium to holding a longer dated maturity contract and/or a lesser-referenced contract, the transactions costs involved in purchasing these contracts require careful monitoring, or the liquidity premium could disappear. This cost may be better evaluated by a manager than through an algorithmic index.

In examining open interest across different maturities for the same commodities, nearer-dated contracts are much more actively traded than their longer-dated counterparts as evidenced by their higher open interest. This is due to near term futures contracts closely resembling current spot prices for the physical commodity. While explicit costs, mainly commissions, should be the same for purchasing nearer-dated maturities versus longer-dated contracts, the implicit transaction costs can be different as market participants require higher bid/offer spreads to compensate for the lower liquidity. Market impact costs can also be higher for the very same reason.

In addition, over the last decade, there have been new commodities introduced into many commodity indices (e.g., Tin, Platinum, KCBT Hard Red Wheat). Consideration should be made to assess the long-term liquidity of these additions to ensure that the market can support significant trading volumes. Otherwise, rising open interest may increase market impact costs and erode the return potential.

With regard to the increase in liquidity for certain commodities recently, consider that in five years ending 6/30/2012, the average daily aggregate open interest and trade volume of US exchange-traded commodities included in the DJ-UBS Index increased by nearly 200% and over 80%, respectively, on a notional basis. Commodities not included in traditional commodity indices also saw surges in liquidity. For example, Platinum open interest and trade volume each increased approximately 400% and 600%, respectively, on a notional basis in the five year period ending 6/30/2012. Palladium also saw strong improvements in liquidity, with increases of approximately 500% and 170% in open interest and trade volume on a notional basis. Finally, Soybean Meal saw increases of 202% in trade volume and 80% in open interest over the same period *(Display 9, next page).*

Display 9: Increases in open interest and trade volume



Note: Annual data points displayed are average daily volumes over the entire one-year rolling period ending June 30, 2012.
Source: Credit Suisse Asset Management, Bloomberg.

Actively Managing Risks

Within any portfolio management process, the objective is to construct a portfolio that incorporates a combination of strategies that will, over time, improve a portfolio's risk-adjusted return profile. In using historical analysis, it is observed that the correlations of the excess returns from various factor-based strategies can be high. While the goal for many investors is to seek strategy diversification, if correlation between strategies is not monitored, an investor may be taking on one giant bet.

It can also be expected that factor based approaches will periodically underperform traditional commodity indices. If the underperformance is due to one-off event-driven risk, a manager may conclude that a particular factor-based strategy still has merit. If, however, the structure of the marketplace has evolved in that 1) the factor is no longer relevant or 2) the period used to observe the factor has changed, then active managers may be able to adapt the investment strategy. Active managers may be able to utilize a flexible decision–making approach to adjust the strategy over time.

Conclusion

"Active" commodity indices have become more popular with investors over the past few years and continue to be a viable option for investors looking to access the asset class. These indices can be effective in targeting particular types of exposure and tilts to the commodity market. Many "active" commodity index products systematically invest according to a certain factor, which has likely been pre-determined based on historical backtests. While indices accommodating these requirements are appropriate for investors who want exposure to specific factors, they should not be considered as complete active solutions. As discussed in this paper, investors can look to both investment managers and "active" indices to create outperformance versus traditional beta-oriented commodity indices. It is important to understand the performance drivers and to allocate between the factors based on expected market conditions.

We believe investors should evaluate and understand the risk factors within active commodity indices before making an investment decision. We also believe that investors may need increased initial and on-going diligence in evaluating an active index. Ultimately, both active indices and active managers provide a viable opportunity to access the commodity markets, depending on an investor's preference, infrastructure and risk management as to which option to use. If an investor is not comfortable choosing, monitoring and managing factor exposures and biases within an "active" index portfolio, an active manager can help evaluate these risks. An experienced active manager may offer the opportunity to dynamically allocate across multiple factors, vary and adjust the factors over time, assess market impact and transaction costs, assess conditions qualitatively, and most importantly, exercise fiduciary responsibility through risk-managing the portfolio.

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