

Bache Commodity IndexSM

Research Report

The BCISM Risk Reduction Methodology: A Case Study

Richard Spurgin, Thomas Scott-Kunkel, and Melissa Donohue
Alternative Investment Analytics

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Introduction

After a significant rally in the first half of 2008, most commodity indices declined more than 20% during the period from July 3 to August 12. The decline over that 40-day period was all-encompassing across commodity sectors—markets were under significant price pressure at the same time. Specific commodity allocation proved to be less of a differentiating factor among index performance because the index component losses were so broad-based.

The Bache Commodity Index (BCISM) declined 15.6% in the same period—a considerably smaller loss than comparable indices—making it the best-performing among all commodity indices tracked by Bloomberg. The BCISM outperformance was driven by the index's risk reduction methodology, which manages risk and volatility through a flexible allocation to Treasury bills. This study explains the unique BCISM risk reduction methodology, and shows how this feature allowed the BCISM to preserve a major portion of the returns earned in the first half of 2008.

Broad-Based Decline in Commodity Prices

The July-August decline was unusual in that all commodity sectors were under significant pressure at the same time. The table at right shows the return of the Dow Jones-AIG (DJAIG) sector indices from July 3 to August 12. Industrial metals was the best-performing sector, declining -15%; while energy was the worst-performing sector, falling -29%. Because all commodity sectors declined substantially, it didn't make much difference whether an index was weighted more towards energy or towards agriculture, because both sectors declined by more than 20%.

The BCISM was able to avoid a 20+ percent decline by dynamically allocating a portion of the index out of commodity futures and into Treasury bills. The table at right shows the performance of BCISM sector indices during this period. The BCISM energy sector declined -18.9%, which is 10.2% better than the DJAIG Energy index. BCISM industrial metals outperformed DJAIG by 5.8%, agriculture by 6.5%, and precious metals by 3.3%.

DJ-AIG Commodity Sector Indices July 3 to August 12	
Sector	Return
Energy	-29.1%
Industrial Metals	-15.0%
Agriculture	-20.3%
Precious Metals	-15.7%
Source: Bloomberg, L.P.	

BCI Sector Indices July 3 to August 12	
Sector	Return
Energy	-18.9%
Industrial Metals	-9.2%
Agriculture	-13.8%
Precious Metals	-12.4%
Source: Bache Commodities	

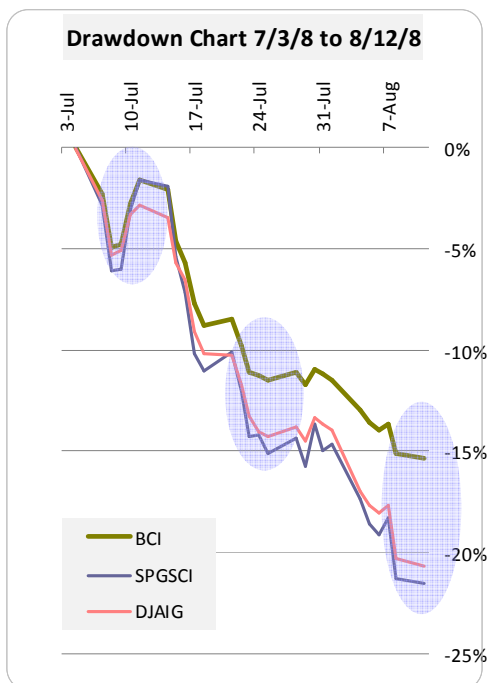
Detailed Analysis of the July/August Drawdown

The performance of the BCISM steadily improved in comparison to the other indices as drawdown continued. The chart at right shows the returns of the BCISM, the DJAIG, and the SPGSCI starting on July 3, a date when all three indices opened the trading session at all-time highs.

During the first week of the decline, the BCISM risk reduction methodology did not offer any benefits, as the BCISM matched the other two indices in declining 5%.

In the second leg of the decline, which ended around July 24, the de-leveraging of the index began to have a noticeable effect as assets were moved into cash.

The BCISM was able to avoid a significant portion of the third move down. From July 30 to August 12, the BCISM declined -4.7%. The SPGSCI fell -8.7% and the DJAIG lost -7.7% during the same period.



The BCISM Risk Reduction Mechanism

The BCISM uses a dynamic asset allocation model to determine how much of each commodity to hold based on price momentum. Each commodity is given a minimum and maximum allocation in the index. The asset allocation model determines whether the allocation should be at the minimum or maximum level, or at some level in between, based on the direction of commodity prices. The sum of the *maximum* allocation of all commodities in the BCISM is 100%, while the sum of the *minimum* allocations is 40%. The portion of the index that is not invested in commodities is allocated to Treasury bills.

Treasury bills have an allocation in the BCISM alongside commodity futures contracts such as crude oil and soybeans (the Treasury bill allocation in the BCISM is also referred to as the *cash allocation*). At times, such as in August 2008, the allocation to Treasury bills in the BCISM is the largest single allocation in the index. At other times, for example in March of 2008, the allocation to Treasury bills is smaller than all but a few minor commodities in the index.

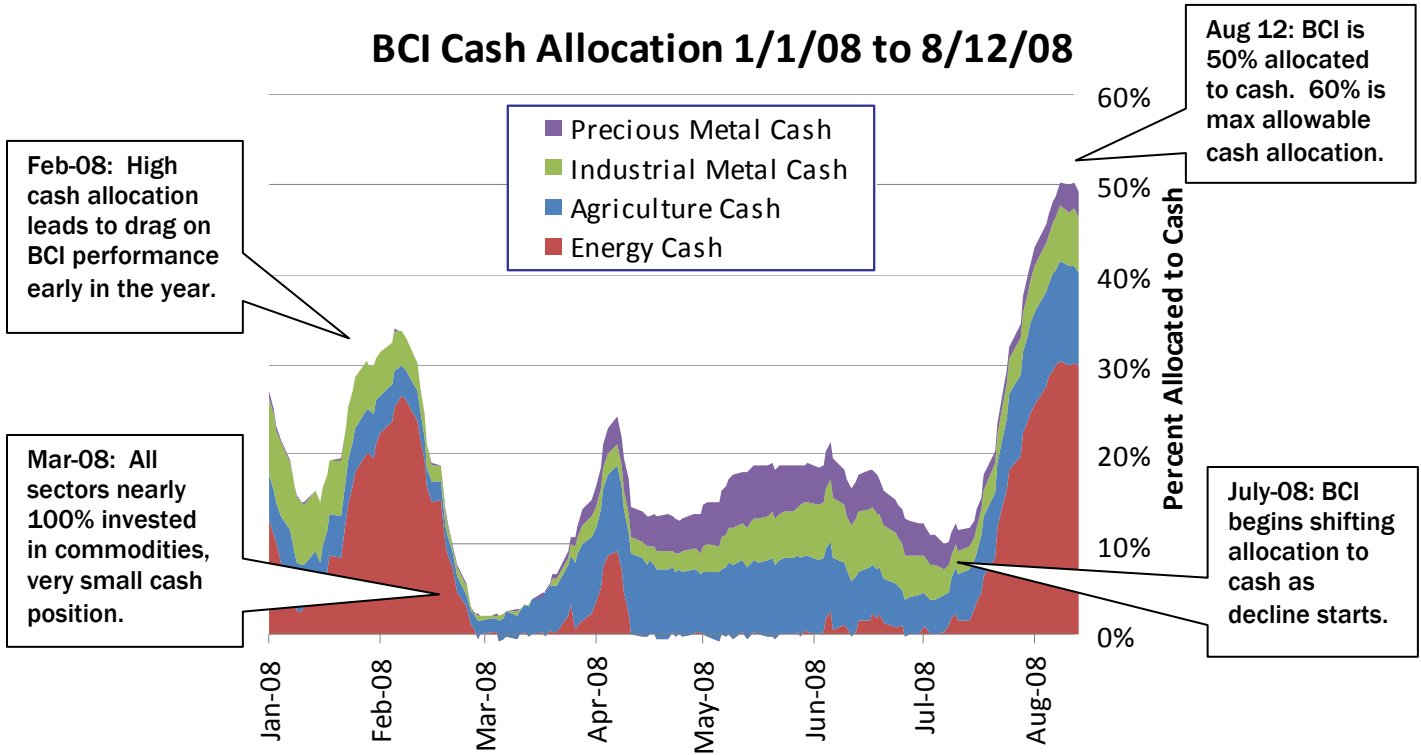
The risk reduction mechanism is based on research into the behavior of commercial commodity traders. Traders typically build commodity inventories when a shortage is anticipated and reduce inventories if a surplus is expected. The BCISM mimics this behavior by slowly increasing the allocation when prices are rising and slowly decreasing the allocation when prices are falling.

The main benefit of the dynamic cash allocation is better performance for the BCISM. When commodity prices are falling, the index can move assets into cash to preserve gains. When commodity prices are rising, the dynamic cash allocation moves more money into the commodities that are trending higher. While holding cash can reduce returns in an up market, volatility is reduced by even more. As a result, the risk-adjusted performance of the BCISM is improved. The dynamic cash allocation also helps reduce the odds of a large loss because the cash allocation will be higher during broad-based declines in commodity prices.

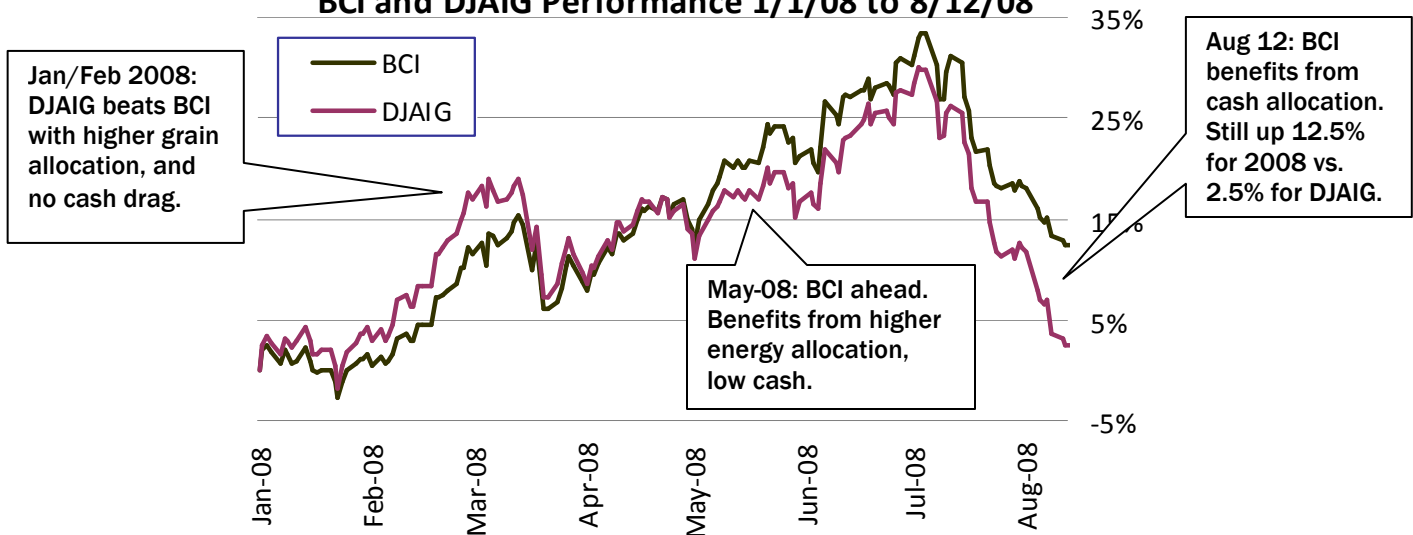
The Dynamic Cash Allocation: A Graphical Analysis

The following graphs show the cash allocation to the BCISM from the start of 2008 until August 12, 2008 and the total return of the BCISM and DJAIG indices over the same period. The cash allocation attributable to each sector is highlighted. The total allocation to cash is equal to the sum of the sector allocations to cash. The energy allocation in the BCISM is equal to 50% of total index weight, so the largest cash allocation is also attributable to energy.

BCI Cash Allocation 1/1/08 to 8/12/08



BCI and DJAIG Performance 1/1/08 to 8/12/08



Potential Problems with the Risk Reduction Approach

While the July-August decline in commodity prices highlights the benefits of a dynamic risk reduction approach, there are potential difficulties that can arise. One issue with the BCISM approach is tracking error. The BCISM has a dynamic beta, while most other indices have a static beta. While the average beta of the BCISM is highly predictable, *fluctuations* in beta can induce considerable tracking error versus other benchmarks if returns are evaluated at short time intervals. For example, the chart on the previous page shows the cash allocation of the BCISM in March 2008 was close to zero, so the beta of the BCISM was close to 1.0 (fully invested). However, five months later, in August 2008 the BCISM had reduced its leverage (and beta) by 50%. The dynamic nature of the BCISM beta means that tracking error and other benchmark performance measures are best evaluated over longer periods of time.

Consistent Performance

The BCISM has outperformed the major commodity index benchmarks in recent years. The table at right shows recent performance for the BCISM, the SPGSCI, the SPGSCI Light Energy, and the DJAIG indices. Several return horizons are analyzed. The BCISM is the top performer among the four indices for the 3-month, 6-month, 2-year, and 3-year time frames. The SPGSCI is the top performer at 6-month and 1-year horizons.

The BCISM return is higher than the SPGSCI Light Energy and DJAIG indices across all time frames analyzed. This shows that an allocation to cash does not necessarily impair returns.

Horizon Analysis for Periods Ending August 12, 2008					
Total Return Horizons:	3 Months	6 Months	1 Year	2 Years	3 Years
BCI	(6.3)	9.3	28.4	13.2	11.6
SPGSCI	(11.0)	11.2	41.2	9.9	6.2
SPGSCI Light Energy	(10.0)	0.6	23.2	9.6	9.6
DJAIG	(12.4)	(3.6)	14.9	8.0	8.3
Volatility Horizons:	3 Months	6 Months	1 Year	2 Years	3 Years
BCI	19.6	20.5	17.5	14.6	14.6
SPGSCI	30.1	28.5	24.8	22.1	22.8
SPGSCI Light Energy	24.1	24.0	20.4	17.7	17.8
DJAIG	21.8	22.4	19.3	17.0	17.6
Sharpe Ratio Horizons:	3 Months	6 Months	1 Year	2 Years	3 Years
BCI	(1.35)	0.79	1.30	0.62	0.54
SPGSCI	(1.49)	0.73	1.34	0.35	0.21
SPGSCI Light Energy	(1.69)	0.01	0.94	0.35	0.37
DJAIG	(2.35)	(0.35)	0.65	0.26	0.31

Returns: Holding periods less than one year are not annualized. Highest return highlighted
 Volatility: Annualized standard deviation of daily returns. Lowest volatility highlighted
 Sharpe ratio: Uses excess return indices and daily data. Highest Sharpe highlighted

The BCISM has the lowest volatility of all four indices in every time horizon. The lower volatility is a direct result of the dynamic risk reduction methodology. With high returns and low volatility, the BCISM delivered consistently higher risk-adjusted returns. The Sharpe ratio of the BCISM and the SPGSCI are similar over 3-, 6-, and 12-month horizons. However, over 2-year and 3-year horizons, the BCISM Sharpe ratio is roughly twice as high as the SPGSCI. When compared to the SPGSCI Light Energy or the DJAIG, the BCISM offers higher returns and lower risk over all time frames analyzed.

Summary

Beginning in July 2008 most commodity indices entered a 20+ percent decline. While large declines are rare—broad-based declines of 20 percent or more occur only about once every three years in commodity markets—these events have a disproportionate impact on the long-run compound rate of return. Through August 12, the BCISM risk reduction methodology preserved 41% of the gains earned in the first half of 2008. Other indices relinquished a higher percentage of first-half gains. For example, the SPGSCI gave up 68% of its first-half gain and the DJAIG relinquished 91%. Furthermore, the BCISM on August 12 held only 50% of its index weight in commodities. With this reduced beta, a further 10% decline in commodity futures prices after August 12 would cause a decline in the BCISM of 5% or less.

Notes:

Source for SPGSCI and DJAIG data is Bloomberg, LP. The source for BCISM data is Bache Commodities Ltd.

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For more information about the Bache Commodity IndexSM, go to www.bache.com and select the tab marked BCI.