Time for a Commodity Comeback?

June 5, 2014
Commodities offer an inherent or natural return that is not conditional on skill. Coupled with the fact that commodities are the basic ingredients that build society, commodities are a unique asset class and should be treated as such.

FUNDAMENTAL SOURCES THAT DRIVE THE COMMODITY ASSET CLASS RETURNS

Components of Return

- T-Bill Rate
- Risk Premium
- Rebalancing
- Convenience Yield
- Expectational Variance

Causes of Return

- Expected Inflation (plus real rate of return)
- Price Uncertainty (producers vs. processors)
- Uncorrelated Volatility (mean reversion)
- Low Inventory Relative to Demand
- Unexpected General Inflation (plus... Individual market “surprises”)

S&P GSCI®

The first major investible commodity index. It is one of the most widely recognized benchmarks that is broad-based and production weighted to represent the global commodity market beta.

• Constituents (currently 24)
  • Must meet eligibility criteria on an annual basis
  • Futures contracts on physical commodities
  • Total Dollar Value Traded (TDVT) minimums
  • Reference Percentage Dollar Weight minimums
  • Denominated in USD and Trading Facility Organization for Economic Cooperation and Development (OECD)
  • Pricing and volume availability

• Sectors (currently 5 groups)
  • Agriculture, Energy, Livestock, Precious Metals, Industrial Metals

• Weight
  • World production-weighted

• Rebalance
  • Annual rebalance, Monthly review

• Roll
  • 20% each day of the 5th through 9th S&P GSCI Business Days of each month
  • Next nearby most liquid contract

Information as of December 31, 2013
MAIN REASONS FOR USING COMMODITIES AS AN ASSET CLASS

• Diversification
  • Low correlations to stocks and bonds

• Inflation Protection
  • Positive correlation to inflation AND changes in the rate of inflation
  • One dollar of commodity index investment may hedge more than one dollar of inflation

• Risk/Return Profile
  Equity-like risk and return
  • Equities = 8.0% return, 15.0% risk
  • Commodities = 6.9% return, 19.1% risk

Survey responses in:
- Diversification
- Low correlations to stocks and bonds
- Inflation Protection
- Positive correlation to inflation AND changes in the rate of inflation
- One dollar of commodity index investment may hedge more than one dollar of inflation
- Risk/Return Profile
  Equity-like risk and return
  • Equities = 8.0% return, 15.0% risk
  • Commodities = 6.9% return, 19.1% risk

Source: S&P Dow Jones Indices. S&P 500, BarCap US Agg, and S&P GSCI represent Stocks, Bonds, and Commodities, respectively. Monthly data from 1/76 - 12/13. Charts and graphs are provided for illustrative purposes only. Indices are unmanaged statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities the index represents. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not an indication of future results. The inception date for the S&P GSCI and S&P GSCI Energy was May 1, 1991, at the market close. All information presented prior to the index inception date is back-tested. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.
COMMODITIES HAVE PROVIDED DIVERSIFICATION FROM STOCKS AND BONDS

Diversification

• Low correlations *using monthly data from 1/76-12/13
  – BarCap US Agg = -0.02
  – S&P 500 = 0.18

• In only 4 years from 1970 through 2013 did both the S&P 500® and the S&P GSCI drop in value.

• From 1991-2013, when the S&P 500® lost, it dropped 14.4% on average while the S&P GSCI gained 125 basis points.

Source: S&P Dow Jones Indices. S&P 500, BarCap US Agg, and S&P GSCI represent Stocks, Bonds, and Commodities, respectively. Monthly data from 1/76 - 12/13. Charts and graphs are provided for illustrative purposes only. Indices are unmanaged statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities the index represents. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not an indication of future results. The inception date for the S&P GSCI and S&P GSCI Energy was May 1, 1991, at the market close. All information presented prior to the index inception date is back-tested. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.
COMMODITIES HAVE PROVIDED DIVERSIFICATION DURING HISTORICAL CRISSES

- Commodities provided diversification during a political crisis
  - Persian Gulf War

- Commodities provided diversification during a financial crisis
  - Black Monday

Source: S&P Dow Jones Indices and Bloomberg. S&P 500 and S&P GSCI represent Stocks and Commodities, respectively. Charts and graphs are provided for illustrative purposes only. Indices are unmanaged statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities the index represents. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not an indication of future results.
THIS HAS LED TO INCREASED PORTFOLIO EFFICIENCY AND CAPITAL PRESERVATION

<table>
<thead>
<tr>
<th>Historical Performance for Hypothetical Portfolios from 1/76-12/13</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>S&amp;P 500</td>
</tr>
<tr>
<td>BarCap US Agg</td>
</tr>
<tr>
<td>S&amp;P GSCI</td>
</tr>
<tr>
<td>Annualized Return</td>
</tr>
<tr>
<td>Annualized Risk</td>
</tr>
<tr>
<td>Sharpe Ratio</td>
</tr>
</tbody>
</table>

Source: S&P Dow Jones Indices and Bloomberg. S&P 500, BarCap US Agg, and S&P GSCI represent Stocks, Bonds, and Commodities, respectively. Monthly data from 1/76 - 12/13. Charts and graphs are provided for illustrative purposes only. Indices are unmanaged statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities the index represents. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not an indication of future results. The inception date for the S&P GSCI was May 1, 1991, at the market close. The inception date for the BarCap US Agg was January 1, 1986. All information presented prior to the index inception date is back-tested. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.
Greater energy exposure has increased correlation to inflation
10-year correlation to CPI yoy Index based on monthly data 1/04-12/13:
S&P GSCI yoy% = 0.77
DJ-UBS CI yoy% = 0.68

Source: S&P Dow Jones Indices and/or its affiliates and ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt Data from Jan 2004 to Dec 2013. Past performance is not an indication of future results. This chart reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with backtested performance.
COMMODITY INDEX INVESTMENTS MAY PROVIDE A LEVERED RESPONSE TO INFLATION

One dollar of commodities may hedge more than one dollar of the portfolio from inflation

<table>
<thead>
<tr>
<th>Dates</th>
<th>Inflation Beta</th>
<th>R-squared</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S&amp;P GSCI</td>
<td>DJ-UBS CI</td>
</tr>
<tr>
<td>1971-2013</td>
<td>2.8</td>
<td>0.12</td>
</tr>
<tr>
<td>1987-2013</td>
<td>12.9</td>
<td>0.48</td>
</tr>
<tr>
<td>1992-2013</td>
<td>15.6</td>
<td>10.3</td>
</tr>
<tr>
<td>2003-2013</td>
<td>13.8</td>
<td>9.1</td>
</tr>
<tr>
<td>2008-2013</td>
<td>15.2</td>
<td>9.6</td>
</tr>
</tbody>
</table>

SOURCE: S&P Dow Jones Indices (rolling 12-month calculations)
Inflation beta data are measured by CPI-U as listed on the website: ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt
R-squared signifies the percentage that inflation explains of the variability in commodity index returns
Inflation beta can be interpreted as: (using DJ-UBS CI 1992-2013 as an example) A 1% increase in inflation results in 10.2% increase in return of the DJ-UBS CI during the period from 1992–2013
Time periods shown reflect first full year of returns for the S&P GSCI (1971), first year crude oil was included in the S&P GSCI (1987), first full year of returns for the DJ-UBS CI (1992), 2003 and 2008 are 5-years and 10-years.

The inception date for the S&P GSCI was May 1, 1991, at the market close. The inception date for the DJ-UBS CI was July 14, 1998, at the market close. All information presented prior to the index inception date is back-tested. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.
S&P acquired the GSCI from Goldman Sachs on February 2, 2007 and it was subsequently renamed the S&P GSCI. Goldman Sachs first began publishing the GSCI related indices in 1991 but has calculated the historical value of the GSCI beginning January 2, 1970 based on actual prices from that date forward and the selection criteria, methodology and procedures in effect during the applicable periods of calculation (or, in the case of all calculations periods prior to 1991, based on the selection criteria, methodology and procedures adopted in 1991. The GSCI has been normalized to a value of 100 on January 2, 1970, in order to permit comparisons of the value of the GSCI to be made over time.

For Financial Professionals. Not for Public Distribution. PROPRIETARY. Permission to reprint or distribute any content from this presentation requires the written approval of S&P Dow Jones Indices.
SHIFTING WORLD ECONOMY?

A possible change in the world economy from one driven by expansion of supply to expansion of demand may be causing the following:

- More persistence of backwardation
- Greater instability of term structure
- Lower correlation between commodities

Source: Societe Generale 2011
BACKWARDATION IS RETURNING

Shortages caused backwardation more frequently since 2011, which may be a result of the shifting economy.

- From 2005-2011, commodities were in contango 93% of months
- In 2012 and 2013 each, 5 of 7 months were in backwardation

https://www.indexologyblog.com/2014/01/03/backwardation-is-back/
COMMODITY CORRELATIONS HAVE FALLEN

A return to pre-crisis levels of correlations:

Between individual commodities


... and to other asset classes

Average of absolute 12-month correlations between DJUBS and hedge funds (HFRX), S&P Global 1500, the US Dollar (DXY), 7 Year US treasuries, Case-Schiller 20 City House Prices and the VIX. As of October 1st 2013. Source: S&P Dow Jones 2013, HFR.
Mathematically, rising interest positively impact commodity futures returns in two ways but that is only if all else is equal.

1. Theory of Storage Equation
   \[ F_{0,T} = S_0 \exp[(r+c-y)T] \]

2. Total Return Includes Interest on Collateral
   \[ S&P \text{ GSCI } TR_d = S&P \text{ GSCI } TR_{d-1} \times (1 + CDR_d + TBR_d)^* \times (1 + TBR_d)^{\text{days}} \]

http://www.indexologyblog.com/2013/11/26/the-exponential-power-of-interest-rates-on-commodities/
EQUITY / COMMODITY CYCLE MAY BE SWITCHING

Source: S&P Dow Jones Indices. Data from Jan 1970 to Feb 2014. Past performance is not an indication of future results. This chart reflects hypothetical historical performance. Please note that any information prior to the launch of the index is considered hypothetical historical performance (backtesting). Backtested performance is not actual performance and there are a number of inherent limitations associated with backtested performance, including the fact that backtested calculations are generally prepared with the benefit of hindsight - See more at: http://www.indexologyblog.com/2014/03/03/commodity-comeback/#sthash.80QtEXkp.dpuf
## INDEX PERFORMANCE SORTED BY 3-YR (All data is * through May 30, 2014)

<table>
<thead>
<tr>
<th>Index</th>
<th>MTD</th>
<th>YTD</th>
<th>12-Months</th>
<th>3-Years</th>
<th>5-Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>S&amp;P GSCI Dynamic Roll</td>
<td>0.41%</td>
<td>3.92%</td>
<td>6.88%</td>
<td>-5.60%</td>
<td>26.76%</td>
</tr>
<tr>
<td>S&amp;P GSCI</td>
<td>-0.18%</td>
<td>3.52%</td>
<td>7.15%</td>
<td>-5.61%</td>
<td>18.11%</td>
</tr>
<tr>
<td>S&amp;P GSCI 3 Month Forward</td>
<td>0.15%</td>
<td>3.24%</td>
<td>7.92%</td>
<td>-5.94%</td>
<td>26.21%</td>
</tr>
<tr>
<td>S&amp;P GSCI Risk Weight</td>
<td>-1.75%</td>
<td>6.85%</td>
<td>4.35%</td>
<td>-7.10%</td>
<td>24.48%</td>
</tr>
<tr>
<td>S&amp;P GSCI Roll Weight Select</td>
<td>0.20%</td>
<td>7.35%</td>
<td>4.07%</td>
<td>-9.66%</td>
<td>21.73%</td>
</tr>
<tr>
<td>S&amp;P GSCI Light Energy</td>
<td>-1.99%</td>
<td>4.95%</td>
<td>2.90%</td>
<td>-12.43%</td>
<td>14.81%</td>
</tr>
</tbody>
</table>

Source: S&P Dow Jones Indices. Charts and graphs are provided for illustrative purposes only. Indices are unmanaged statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities the index represents. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not an indication of future results.
PERFORMANCE DISCLOSURE

All information presented prior to the launch date is back-tested. Back-tested performance is not actual performance, but is hypothetical. The back-test calculations are based on the same methodology that was in effect when the index was officially launched. Complete index methodology details are available at www.spdji.com. It is not possible to invest directly in an index.

S&P Dow Jones Indices defines various dates to assist our clients in providing transparency on their products. The First Value Date is the first day for which there is a calculated value (either live or back-tested) for a given index. The Base Date is the date at which the Index is set at a fixed value for calculation purposes. The Launch Date designates the date upon which the values of an index are first considered live: index values provided for any date or time period prior to the index’s Launch Date are considered back-tested. S&P Dow Jones Indices defines the Launch Date as the date by which the values of an index are known to have been released to the public, for example via the company's public website or its datafeed to external parties. For Dow Jones-branded indicates introduced prior to May 31, 2013, the Launch Date (which prior to May 31, 2013, was termed “Date of introduction”) is set at a date upon which no further changes were permitted to be made to the index methodology, but that may have been prior to the Index’s public release date.

Past performance of the Index is not an indication of future results. Prospective application of the methodology used to construct the Index may not result in performance commensurate with the back-test returns shown. The back-test period does not necessarily correspond to the entire available history of the Index. Please refer to the methodology paper for the Index, available at www.spdji.com for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations.

Another limitation of using back-tested information is that the back-tested calculation is generally prepared with the benefit of hindsight. Back-tested information reflects the application of the index methodology and selection of index constituents in hindsight. No hypothetical record can completely account for the impact of financial risk in actual trading. For example, there are numerous factors related to the equities, fixed income, or commodities markets in general which cannot be, and have not been accounted for in the preparation of the index information set forth, all of which can affect actual performance.

The Index returns shown do not represent the results of actual trading of investable assets/securities. S&P Dow Jones Indices LLC maintains the Index and calculates the Index levels and performance shown or discussed, but does not manage actual assets. Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the Index or investment funds that are intended to track the performance of the Index. The imposition of these fees and charges would cause actual and back-tested performance of the securities/fund to be lower than the Index performance shown. As a simple example, if an index returned 10% on a US $100,000 investment for a 12-month period (or US $10,000) and an actual asset-based fee of 1.5% was imposed at the end of the period on the investment plus accrued interest (or US $1,650), the net return would be 8.35% (or US $8,350) for the year. Over a three year period, an annual 1.5% fee taken at year end with an assumed 10% return per year would result in a cumulative gross return of 33.10%, a total fee of US $5,375, and a cumulative net return of 27.2% (or US $27,200).
GENERAL DISCLAIMER

© S&P Dow Jones Indices LLC, a part of McGraw Hill Financial 2014. All rights reserved. Standard & Poor’s and S&P are registered trademarks of Standard & Poor’s Financial Services LLC (“S&P”), a part of McGraw Hill Financial. Dow Jones is a registered trademark of Dow Jones Trademark Holdings LLC (“Dow Jones”). Trademarks have been licensed to S&P Dow Jones Indices LLC. Redistribution, reproduction and/or photocopying in whole or in part are prohibited without written permission. This document does not constitute an offer of services in jurisdictions where S&P Dow Jones Indices LLC, Dow Jones, S&P or their respective affiliates (collectively “S&P Dow Jones Indices”) do not have the necessary licenses. All information provided by S&P Dow Jones Indices is impersonal and not tailored to the needs of any person, entity or group of persons. S&P Dow Jones Indices receives compensation in connection with licensing its indices to third parties. Past performance of an index is not a guarantee of future results.

It is not possible to invest directly in an index. Exposure to an asset class represented by an index is available through investable instruments based on that index. S&P Dow Jones Indices does not sponsor, endorse, sell, promote or manage any investment fund or other investment vehicle that is offered by third parties and that seeks to provide an investment return based on the performance of any index. S&P Dow Jones Indices makes no assurance that investment products based on the index will accurately track index performance or provide positive investment returns. S&P Dow Jones Indices LLC is not an investment advisor, and S&P Dow Jones Indices makes no representation regarding the advisability of investing in any such investment fund or other investment vehicle. A decision to invest in any such investment fund or other investment vehicle should not be made in reliance on any of the statements set forth in this document. Prospective investors are advised to make an investment in any such fund or other vehicle only after carefully considering the risks associated with investing in such funds, as detailed in an offering memorandum or similar document that is prepared by or on behalf of the issuer of the investment fund or other vehicle. Inclusion of a security within an index is not a recommendation by S&P Dow Jones Indices to buy, sell, or hold such security, nor is it considered to be investment advice.

These materials have been prepared solely for informational purposes based upon information generally available to the public and from sources believed to be reliable. No content contained in these materials (including index data, ratings, credit-related analyses and data, research, valuations, model, software or other application or output therefrom) or any part thereof (Content) may be modified, reverse-engineered, reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of S&P Dow Jones Indices. The Content shall not be used for any unlawful or unauthorized purposes. S&P Dow Jones Indices and its third-party data providers and licensors (collectively “S&P Dow Jones Indices Parties”) do not guarantee the accuracy, completeness, timeliness or availability of the Content. S&P Dow Jones Indices Parties are not responsible for any errors or omissions, regardless of the cause, for the results obtained from the use of the Content. THE CONTENT IS PROVIDED ON AN “AS IS” BASIS. S&P DOW JONES INDICES PARTIES DISCLAIM ANY AND ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, FREEDOM FROM BUGS, SOFTWARE ERRORS OR DEFECTS, THAT THE CONTENT’S FUNCTIONING WILL BE UNINTERRUPTED OR THAT THE CONTENT WILL OPERATE WITH ANY SOFTWARE OR HARDWARE CONFIGURATION. In no event shall S&P Dow Jones Indices Parties be liable to any party for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees, or losses (including, without limitation, lost income or lost profits and opportunity costs) in connection with any use of the Content even if advised of the possibility of such damages.
THANK YOU

Jodie Gunzberg, CFA
Global Head of Commodities
jodie.gunzberg@spdji.com