Identifying Return Opportunities In A Demand-Driven World Economy

Liquidity risk premia are shifting, as the world economy may be entering a new paradigm driven by expansion of demand. This potential economic shift could significantly affect commodities.

The S&P GSCI Dynamic Roll, launched in January 2011, aims to identify return opportunities in this space. The index demonstrated its effectiveness in 2012 when it outperformed the S&P GSCI[®] and other modified roll indices. This paper highlights historical statistics from the S&P GSCI Dynamic Roll and demonstrates its viability as an index solution that readily identifies opportunities for capturing the liquidity risk premia in commodity futures.

INTRODUCTION

Total assets under management for commodities have almost tripled in size during the past few years to USD 429 billion from roughly USD 150 billion when the market bottomed in 2008[1]. Inflows of large investments into commodities, coupled with lackluster performance of first-generation indices like the S&P GSCI, may give the impression that liquidity risk premia earned by investing in futures on physical commodities have diminished. In turn, this may also suggest that these inflows have filled the gap created by a lack of consumer hedging relative to the need of producers to hedge. This however does not appear to be the case, proven by the increasing positive returns, on average, from deferred expirations in the modified roll indices (for example, the S&P GSCI Enhanced and S&P GSCI Forward) during this timeframe**.** Therefore, the implication is that the liquidity risk premia are not fading but shifting.

However, this implication is not so straightforward. It seems to be contradicted by the fact that for the first time since 2000, the S&P GSCI outperformed both the S&P GSCI Enhanced and S&P GSCI Forward 3-Month in 2012. Most investors have never seen underperformance like this before from these two modified roll indices since, during the time that they have been investing in commodities, the commodity futures curves have been predominantly in contango.

When a near-month futures contract is trading at a discount to more distant contracts, we say that a commodity futures curve is in "contango." This happens when commodities are plentiful so the prices of the futures contracts include carrying costs such as storage, insurance and interest costs. When there is a scarcity of commodities, a converse situation occurs. In this case, the near-month futures contract trades at a premium to more distant contracts, and we say that a commodity futures curve is in "backwardation" or that the commodity is "backwardated." This occurs when inventories of commodities are tight so market participants are willing to pay a premium to buy the immediate deliverable commodity.[2] (See Exhibit 5 for the S&P GSCI annual total returns.)

Contributors:

Jodie Gunzberg, CFA
Vice President
jodie.gunzberg@spdji.com

Marya Alsati-Morad
Associate Director, Commodities
marya.alsati-Morad@spdji.com

Peter Tsui
Director, Index Research & Design
peter.tsui@spdji.com

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[1]Barclays Commodities Research. The Commodity Investor, The Rebalancing Riddle, page 17. Nov. 30, 2012.
[2] Till, Hilary edited by Gregoriou, Greg N., Encyclopedia of Alternative Investments, pages 38-39, 101. CRC Press, 2009.

When commodity futures curves are in contango, indices that hold the near-month commodity futures contracts, like the first generation of both the S&P GSCI and DJ-UBS CI, may earn a negative return from rolling into more expensive contracts, which is necessary before expiry to avoid delivery. Generally, the contracts with longer-dated expirations have incrementally lower embedded costs, so there is a chance to reduce losses by holding more distant contracts. On the other hand, when commodities are backwardated, indices that hold the near-month commodity futures contracts may earn a positive return from rolling into a cheaper contract before expiry.

Clearly, from the performance of the S&P GSCI and the modified roll indices noted above, the story is more complicated than a one-time shift of the premium away from the front month. In 2012 fundamentals shifted quickly, driving curves into backwardation and then contango, followed by backwardation again. The S&P GSCI, a first generation index that holds the front-month contracts, outperformed modified roll indices like the S&P GSCI Enhanced and S&P GSCI 3-Month Forward for the year—reversing the previous trend. However, the S&P GSCI Dynamic Roll outperformed other modified roll indices and the S&P GSCI through the end of the year (2012) of changing term structures, due to its ability to identify the optimal contracts on the curve every month.

Rather than locking in on a single short- or long-date roll strategy, the S&P GSCI Dynamic Roll aims to dynamically identify the points on a commodity forward curve that offer the best liquidity risk premia opportunities. In 2012, this index proved its ability to respond dynamically to changing market conditions by outperforming both the first- and second-generation commodity indices that are static.

The Environment

As addressed in the introduction, backwardation is profitable to a front-month index and occurs when there is a shortage and no value to storage, while contango causes loss to a front-month index and occurs when there is normal inventory and a value for storage (see Exhibit 1).
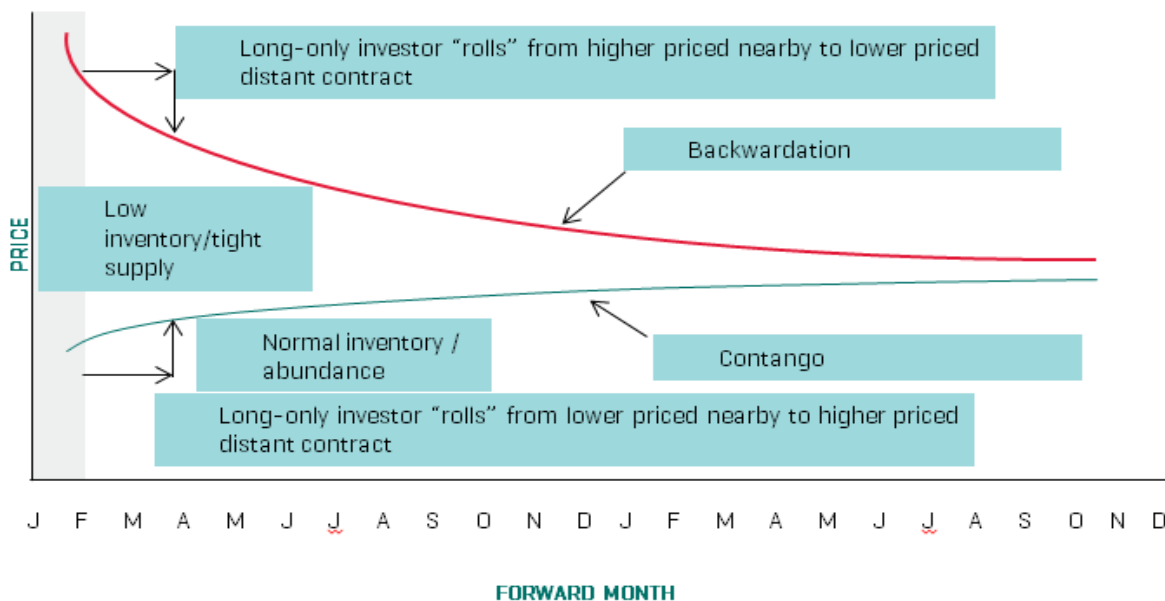
Exhibit 1: **Examples of a Forward Curve**

Chart is provided for illustrative purposes only.

When the world's economic growth is driven by expansion of demand, one characteristic may be more frequent inventory shortages across multiple markets. However, the persistence of the shortages is not as

great (when the growth is driven by expansion of demand) as the persistence of excess inventories is when the world growth is driven by expansion of supply.

In order to examine the possible state of world growth, we analyzed the history of backwardation (indication of shortage) and contango (indication of excess) as measured by the monthly roll yield in the S&P GSCI over a 17-year period. We calculated the monthly roll yield by taking the monthly return of the S&P GSCI Excess Return (which measures the price return plus the roll return) less the monthly returns of the S&P GSCI Spot Return (which measures the price return only). Backwardation was implied by a positive result, whereas contango was implied by a negative result.

Since the frequency of changing between backwardation and contango is a possible result of the world economic condition, indices that have flexibility when the growth is driven by expansion of demand may benefit. This is shown in the analysis in table 5 where we used monthly index levels from January 1995 to December 2012, based on total return versions for the S&P GSCI, the S&P GSCI Enhanced, the S&P GSCI 3 Month Forward and the S&P GSCI Dynamic Roll.

As expected, the commodity futures curves are in contango most of the time since this should be the resulting term structure when supplies are ample and inventories are normal (see Exhibit 2). Exhibit 2 shows that commodity futures curves have been in contango 69% of the time since February 1995.

Exhibit 2: The Environment Characterized By Term Structure				
Year	No. of Months	Contango	Backwardation	Contango (%)
1995	11	6	5	55
1996	12	2	10	17
1997	12	8	4	67
1998	12	12	0	100
1999	12	11	1	92
2000	12	0	12	0
2001	12	8	4	67
2002	12	8	4	67
2003	12	3	9	25
2004	12	5	7	42
2005	12	12	0	100
2006	12	12	0	100
2007	12	12	0	100
2008	12	9	3	75
2009	12	12	0	100
2010	12	12	0	100
2011	12	9	3	75
2012	12	7	5	58
Total	215	148	67	69

Source: S&P Dow Jones Indices. Data provided from 1995 through 2012.

In the period from 2005-2011, contango occurred in 93% of the months, which again is unfavorable for a front-month index. According to Exhibit 2, the percentage of time in contango dropped noticeably from 2011 to 2012, which may reflect a more fundamental shift in the world economy. From the early 1980s to about 2005, supply growth drove the economy, meaning low but growing inventories and backwardation moving toward contango, among other market trends. There was backwardation during this period until inventories built up enough to have large positive storage costs to drive the curves into contango around 2005. There have been more times of shortage in 2012 than there have been in the past several years. The demand for oil was relatively high in early 2012 and the well-documented drought that occurred during the summer subsequently drove commodity curves back into backwardation. According to a 2011 article discussing the commodities sector, the economy may be entering a new era of world growth driven by demand, which could ultimately favor commodities (see Exhibit 3).

Exhibit 3: World Growth Shift from Expansion of Supply to Expansion of Demand.[3]

If this analysis is the case and there is a structural increase in the cost of raw materials, then the lower inventories may cause commodities to be more sensitive to price spikes with a rise in cycle frequency and magnitude. In this type of environment, it is possible that the first generation indices may recover and more dynamic strategies like the S&P GSCI Dynamic Roll could outperform static strategies across the curve.

Historical Performance Analysis

Each of the modified roll indices predominantly outperformed the S&P GSCI during periods of both backwardation and contango. As Exhibit 4 illustrates, the S&P GSCI Enhanced outperformed the S&P GSCI in each environment more times than the other modified roll indices outperformed the S&P GSCI, which can be expected given the methodologies. The S&P GSCI Enhanced is less static than the S&P GSCI 3-Month Forward due to its dynamic rules for Brent Crude Oil and WTI Crude Oil based on term structure in addition to its seasonal rules. It also does not have a provision to reduce trading costs like the S&P GSCI Dynamic Roll.

Exhibit 4: Number of Months S&P GSCI Modified Roll Outperformed S&P GSCI per Term Structure		
Months of Outperformance vs. S&P GSCI TR		
	Contango	**Backwardation**
Total Count	148	67
S&P GSCI 3-Month Forward TR	99	37
S&P GSCI Enhanced TR	108	43
S&P GSCI Dynamic Roll TR	98	37

Source: S&P Dow Jones Indices. Data is provided for illustrative purposes only covering the 215 months from 1995 to 2012. Past performance is not an indication of future results.

While the number of months of outperformance versus the S&P GSCI is dominated by the S&P GSCI Enhanced, the magnitude of return outperformance is far greater, at almost 700% cumulatively, from the S&P GSCI Dynamic Roll (see Exhibit 5). The magnitude of outperformance occurred largely from 2005-2009. This was mainly due to the expanded opportunity set of contract expirations included by rules of the methodology for the S&P GSCI Dynamic Roll, in addition to its monthly evaluation to measure the highest implied roll yields with the aim of optimizing the roll return while minimizing turnover.

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[3] Isherwood, Guy. Commodities: New Facts & Fantasies, Commodities Now, Navigating the Commodity Complex. Volume 15. Issue 3, Page 31, September 2011.

| **Exhibit 5: Annual Total Returns of Commodity Indices** | | | |
Year	S&P GSCI TR (%)	S&P GSCI 3-Month Forward TR (%)	S&P GSCI Enhanced TR (%)	S&P GSCI Dynamic Roll TR (%)
1995	23.4	17.4	21.1	15.2
1996	33.9	32.6	41.3	37.8
1997	-14.1	0.0	-2.9	-4.5
1998	-35.8	-29.9	-27.6	-22.1
1999	40.9	40.6	40.8	32.0
2000	49.8	39.6	44.6	32.1
2001	-39.1	-17.4	-19.1	-15.4
2002	32.1	33.3	35.6	29.0
2003	20.7	28.2	25.0	28.7
2004	17.3	37.0	31.7	37.6
2005	25.6	46.1	44.9	55.8
2006	-15.1	-2.1	0.9	8.8
2007	32.7	36.5	36.2	38.0
2008	-46.5	-39.2	-41.1	-26.1
2009	13.5	20.8	21.6	18.2
2010	9.1	12.1	12.1	9.5
2011	-1.2	0.4	0.5	-0.4
2012	0.1	-1.4	-0.1	3.0
Total	127.0	558.7	609.9	814.0

Source: S&P Dow Jones Indices. Data from 1995 to 2012. 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 back-tested performance.

Lastly, it is particularly worth noting that in 2012 the S&P GSCI Dynamic Roll outperformed the S&P GSCI in a year when the S&P GSCI outperformed the two modified roll indices. This was not only the first year since 2000 that the modified roll indices lagged the S&P GSCI, but it was also the first year that the S&P Dynamic Roll beat the S&P GSCI while the others did not. This again may suggest that the S&P Dynamic Roll index may be more resilient in responding to market shifts than either the classic or modified "static" strategies.

| **Exhibit 6: Performance Comparison of Annual Returns of S&P GSCI Modified Roll vs S&P GSCI** | | |
| **Margin of Outperformance vs. S&P GSCI** | | |
Year	S&P GSCI 3-Month Forward TR (%)	S&P GSCI Enhanced TR (%)	S&P GSCI Dynamic Roll TR (%)
1995	-5.5	-2.3	-7.1
1996	-1.5	5.4	2.6
1997	15.0	12.1	9.7
1998	8.0	11.4	18.9
1999	-0.9	-0.7	-8.0
2000	-7.9	-3.6	-12.7
2001	20.2	18.0	22.8
2002	0.5	2.4	-3.2
2003	4.1	1.8	5.1
2004	16.4	12.2	16.5
2005	16.1	15.0	23.1
2006	14.8	18.1	26.3
2007	2.7	2.7	3.6
2008	12.1	8.5	31.3
2009	5.8	6.2	2.4
2010	2.5	2.4	-0.9
2011	1.7	1.7	0.0
2012	-1.6	-0.3	2.3

Source: S&P Dow Jones Indices. Data from 1995 to 2012. 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 back-tested performance.

The most interesting margin of outperformance yet between the S&P GSCI Dynamic Roll and the S&P GSCI occurred in 2012. As mentioned in the introduction, many investors were surprised to see that most of the modified roll indices underperformed the first generation indices in 2012. There has not been a single year since 2000 that both the S&P GSCI Enhanced and S&P GSCI 3-Month Forward underperformed the S&P GSCI (see Exhibit 6). Also, there has never been a year until 2012 that the S&P GSCI Dynamic Roll outperformed the S&P GSCI while the other modified roll indices underperformed the S&P GSCI. This may cause more frequent shortages, which may benefit more dynamic indices that have the flexibility to adjust to the changing term structures by holding contracts with either near or later dated expirations.

ABOUT S&P DOW JONES INDICES

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PERFORMANCE DISCLOSURE

The S&P GSCI was launched on May 1, 1991. 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 on the launch date. Complete index methodology details are available at www.spdji.com.

The S&P GSCI Dynamic Roll was launched on January 27, 2011. 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 on the launch date. Complete index methodology details are available at www.spdji.com.

The S&P GSCI Enhanced was launched on March 31, 2007. 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 on the launch date. Complete index methodology details are available at www.spdji.com.

The S&P GSCI Forward 3-Month was launched on Jan. 3, 2008. 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 on the launch date. Complete index methodology details are available at www.spdji.com.

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 Web site or its datafeed to external parties. For Dow Jones-branded indices 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 (or 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.

Additionally, it is not possible to invest directly in an Index. The Index returns shown do not represent the results of actual trading of investable assets/securities. S&P Dow Jones Indices 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. For 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).

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