INVESTMENT OPPORTUNITIES

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INVESTMENT OPPORTUNITIES

A. Investment Vehicles

B. Commodity Indices

C. Active Commodity Futures Programmes

Icon above is based on the statue in the Chicago Board of Trade plaza.

Investment Opportunities

This section is drawn from:

- **Akey, R., 2007, "Alpha, Beta, and Commodities: Can a Commodities Investment be Both a High Risk-Adjusted Return Source and a Portfolio Hedge?", in H. Till and J. Eagleeye (ed) *Intelligent Commodity Investing* (London: Risk Books); and …**

Investment Opportunities

This article was also published in:

- ***The Journal of Wealth Management*, Fall 2006, pp. 63-82.**

- **Rian Akey's firm is Cole Partners, http://www.colepartners.com.**

Investment Opportunities

This section is also drawn from:

- **Akey, R., 2005, "Commodities: A Case for Active Management", *Journal of Alternative Investments*, Fall, Vol. 8, No. 2 pp. 8-29;**

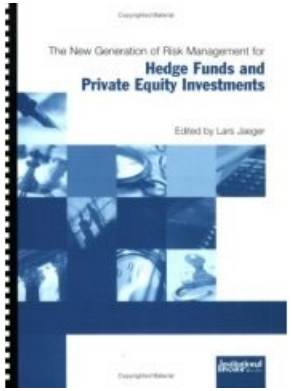
- **Till, H., 2006, "Structural Sources of Return & Risk in Commodity Futures Investments," *Commodities Now*, June, pp. 57-65; …**

COMMODITIES NOW

Investment Opportunities

In addition, this section is drawn from:

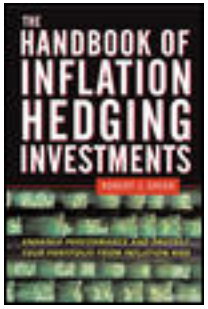
- **Till, H. and J. Eagleeye, 2003, "The Risks of Commodity Investing", in L. Jaeger (ed) *The New Generation of Risk Management for Hedge Funds and Private Equity Investment* (London: Euromoney Books), pp. 179-198; and …**



Investment Opportunities

This section is also drawn from:

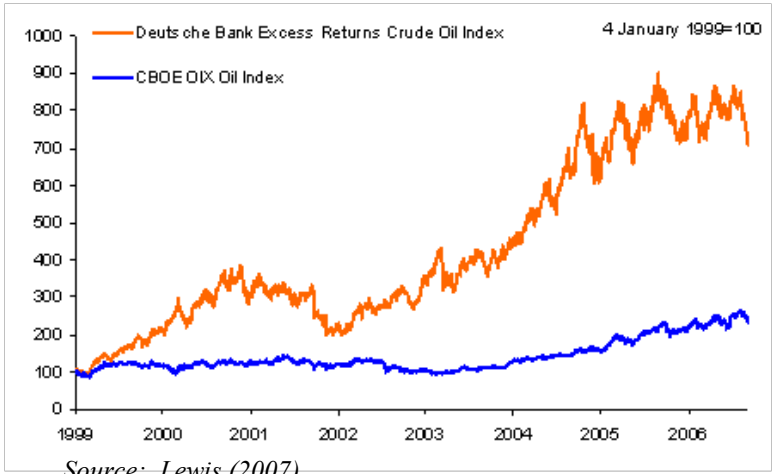
- **Till, H. and J. Eagleeye, 2006, "Commodities – Active Strategies for Enhanced Return," a chapter in *The Handbook of Inflation Hedging Investments* (Edited by Robert Greer), McGraw Hill: New York, pp. 127-157;**



- **… which was also published in *Journal of Wealth Management*, Fall 2005, pp. 42-61.**

A. Investment Vehicles

- **Many investment vehicles exist:**
  - **Direct cash investment**
  - **Commodity-based equities**
  - **Mutual Funds**



Source: Lewis (2007).

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Source: Beenen (2005).

A. Investment Vehicles

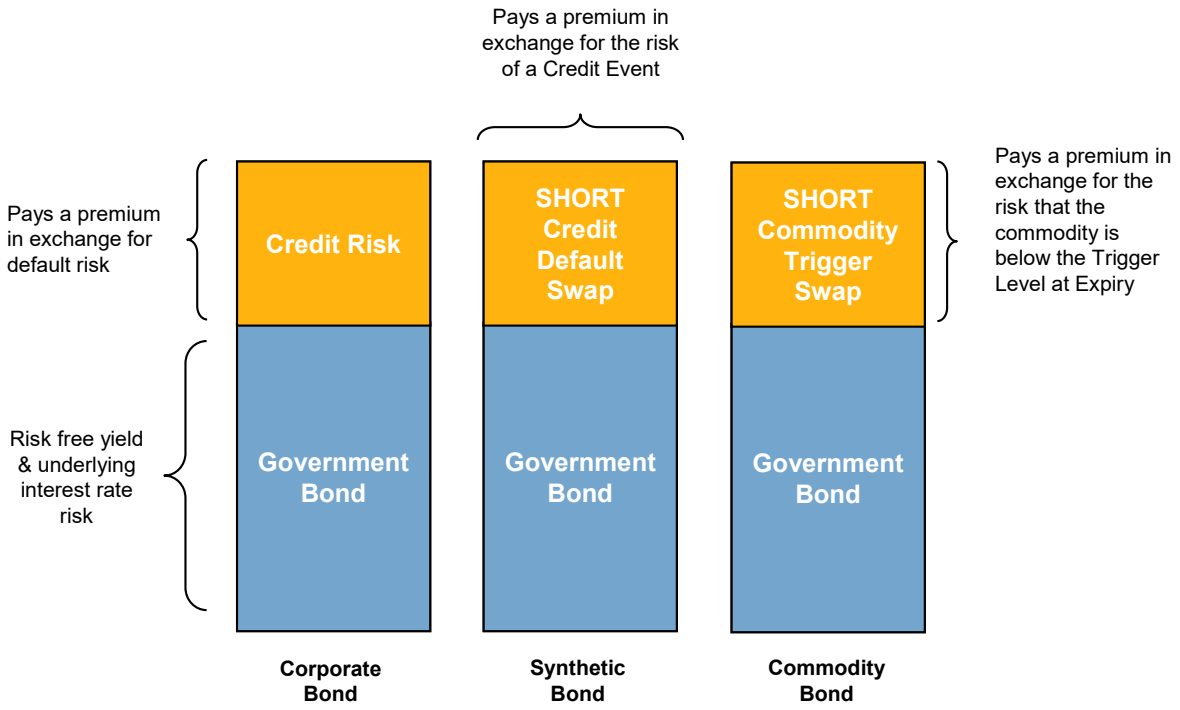
- **Investments in commodity indices through futures, swaps, exchange-traded funds, mutual funds and structured notes**
- **Managed Futures**
- **Natural Resources hedge funds and fund-of-funds**

Source: Beenen (2005).

A. Investment Vehicles

- **There has been significant innovation in structured products as well.**

Collateralised Commodity Obligations



Source: Schwab (2007).

B. Commodity Indices

- **A comparative review of key commodity indices**
- **Performance attribution**
- **Economic sources of return**
- **Limitations**

B. Commodity Indices

Commodity Indices

- **The objective:**
  - **to construct a basket of commodity futures that measure broad commodity price changes.**

- **The construction and calculation methodology varies widely from one to another.**

Source: Akey (2007).

B. Commodity Indices

Comparative Matrix of Key Commodity Indexes

	Reuters - CRB	DBLCI	Goldman Sachs	Dow Jones - AIG	Rogers' Raw Materials	Standard & Poors
Inception of Backfilled Data	Jan-82	Dec-88	Jan-69	Jan-91	Jan-84	Jan-70
Inception of Investable Component	1986 (Month not noted)	Feb-03	Jul-92	Jul-98	Aug-98	Aug-01
Number of Underlying Markets	17	6	24	19	35	17
How Underlying Markets are Selected	Attempts to create broad measure of overall commodity price trends	Selects the most liquid markets from each respective sector	Based on world production. Must meet liquidity requirements	Relies primarily on liquidity data, along with dollar-adjusted production data	Attempts to create a true "worldwide commodity index"	Only "consumed" commodities so excludes gold
How Underlying Markets are Weighted	Evenly Weighted	Attempts to be broadly consistent with global production, usage, and stocks	World-production weighted; determined by average quantity of production in last five years	Primarily based on liquidity over most recently available five years ... considers U.S.dollar-weighted production data and other factors	Based generally on world consumption patterns for raw materials	Based on commercial open interest; adjusts for double counting upstream/downstream commodities (Eg, Corn - Cattle)
Domestic / International Commodities	International	International	International	International	International	Domestic Only
Diversification Constraints	None	None	None	33% sector max; 2% market minimum	None	None
Most Recent Change in Markets / Weightings	1995	2004	2005	2005	2004	2005
Futures Price Considered for Index Calculation	Arithmetic average of contract months expiring w/in 6 months of current date; min. 2, max. 5 contracts	Nearest month for Metals and Ags; following December for Energy	Nearest month with adequate liquidity	Nearby futures contract	Nearby futures contract, not in delivery or notice period	Average of the 2 nearest active contract months that are not in delivery
How Index is Calculated	Geometric average of each market's average price	Arithmetic average of each market's price	Arithmetic average of each market's price	Arithmetic average of each market's price	Arithmetic average of each market's price	Geometric average of each market's price
Unique Elements	Equal Weighting; Considers 'farthest out' futures; Geometric Averaging	Energy rolled monthly; metals and ags rolled annually each November; only 6 markets	Production based average brings energy bias; can be 75% or more of portfolio	Emphasis on liquidity for weighting; diversification rules	Most diversified; most subjective; most "exotics"; highest exposure to a single market (35% in crude oil)	Excludes Gold; adjustment for "double counting"

Source: Akey (2007).

B. Commodity Indices

Comparative Matrix of 2006 Commodity Index Market Base Weightings

		CRB	DBLCI	DJ-AIG	GSCI	RRM	S&P
Metals	Aluminum		12.50%	7.06%	3.31%	4.00%	
	Copper	5.88%		5.89%	2.42%	4.00%	3.50%
	Gold	5.88%	10.00%	5.98%	2.12%	3.00%	
	Lead				0.31%	2.00%	
	Nickel			2.61%	0.93%	1.00%	
	Palladium					0.30%	
	Platinum	5.88%				1.80%	
	Silver	5.88%		2.00%	0.23%	2.00%	3.78%
	Tin					1.00%	
	Zinc			2.69%	0.57%	2.00%	
Sector Total		**23.52%**	**22.50%**	**26.23%**	**9.89%**	**21.10%**	**7.28%**
Energy	Brent Crude Oil				11.75%		
	Crude Oil	5.88%	35.00%	12.81%	25.79%	35.00%	9.74%
	GasOil				3.83%		
	Heating Oil	5.88%	20.00%	3.85%	7.14%	3.00%	11.49%
	Natural Gas	5.88%		12.28%	10.29%	3.00%	17.65%
	Unleaded Gas			4.05%	7.90%	3.00%	10.32%
Sector Total		**17.64%**	**55.00%**	**32.99%**	**66.70%**	**44.00%**	**49.20%**
Ags	Azuki					1.00%	
	Barley					0.77%	
	Canola					0.67%	
	Corn	5.88%	11.25%	5.94%	4.11%	4.00%	4.96%
	Feeder Cattle				0.90%		
	Lean Hogs	5.88%		4.39%	2.39%	1.00%	1.78%
	Live Cattle	5.88%		6.15%	3.74%	2.00%	5.03%
	Oats					0.50%	
	Rice					2.00%	
	Soybean Meal					0.15%	3.81%
	Soybean Oil			2.67%		2.00%	3.90%
	Soybeans	5.88%		7.60%	3.01%	3.00%	4.79%
	Wheat	5.88%	11.25%	4.87%	5.28%	7.00%	5.05%
Sector Total		**29.40%**	**22.50%**	**31.62%**	**19.43%**	**24.09%**	**29.32%**
Softs	Orange Juic	5.88%				0.66%	
	Cocoa	5.88%			0.30%	1.00%	3.27%
	Coffee	5.88%		3.02%	0.68%	2.00%	3.36%
	Cotton	5.88%		3.23%	1.74%	3.00%	4.18%
	Sugar	5.88%		2.93%	1.26%	1.00%	3.39%
Sector Total		**29.40%**	**0.00%**	**9.18%**	**3.98%**	**7.66%**	**14.20%**
Exotics	Lumber					1.00%	
	Rubber					1.00%	
	Silk					0.15%	
	Wool					1.00%	
Sector Total		**0.00%**	**0.00%**	**0.00%**	**0.00%**	**3.15%**	**0.00%**
TOTALS		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: Akey (2007).

B. Commodity Indices

Commodity Indices

- **The differences can have a substantial impact on how each index performs.**
- **This demonstrates that an investor's experience with an indexed commodities investment may vary significantly based upon how the exposure is configured.**

	2005	2002-2005	1991-2005
DeutscheBank Liquid Commodity Index (DBLCI)	17.54%	25.70%	10.57%
Dow Jones - AIG Total Return Index (DJ-AIG)	21.36%	19.90%	7.78%
GSCI Total Return Index (GSCI)	25.55%	23.78%	6.88%
Reuters Jefferies CRB Index (RJCRB)	18.86%	15.21%	4.27%
Rogers International Commodity Index (RICI)	19.55%	26.45%	10.70%
S&P Commodity Index (SPCI)	30.79%	24.84%	10.22%
S&P 500 Total Return Index	4.91%	3.92%	11.53%
Lehman Brothers Long Term Treasury Index	6.71%	8.35%	9.09%
HFR Fund of Funds Index	7.51%	6.76%	10.48%
Barclay CTA Index	1.66%	6.42%	5.67%

Source: Akey (2007).

B. Commodity Indices

Commodity Indices

- **A comparative review of key commodity indices**

Annualised volatility of commodity indexes

	2005	2002-2005	1991-2005
DeutscheBank Liquid Commodity Index (DBLCI)	17.17%	18.25%	18.41%
Dow Jones - AIG Total Return Index (DJ-AIG)	14.64%	13.43%	12.06%
GSCI Total Return Index (GSCI)	24.31%	22.27%	18.59%
Reuters Jefferies CRB Index (RJCRB)	12.12%	9.78%	8.71%
Rogers International Commodity Index (RICI)	13.82%	13.90%	14.04%
S&P Commodity Index (SPCI)	20.00%	17.83%	15.46%

Source: Akey (2007).

B. Commodity Indices

Commodity Indices

- **A comparative review of key commodity indices**

Worst drawdowns of commodity indexes

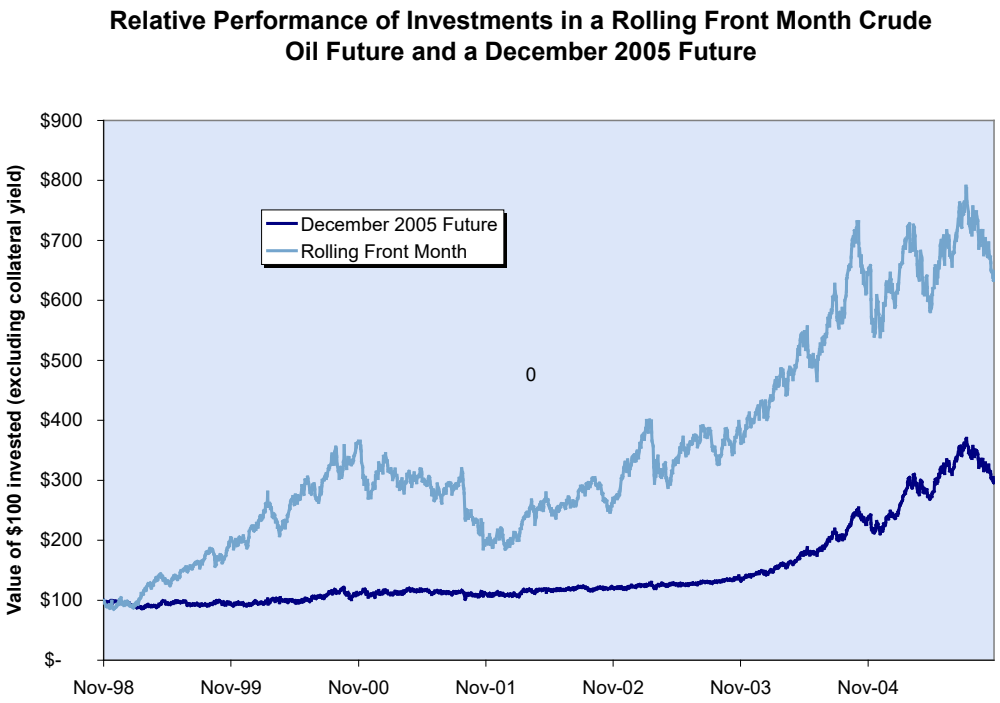
	2005	2002-2005	1991-2005
DeutscheBank Liquid Commodity Index (DBLCI)	-10.53%	-16.78%	-46.11%
Dow Jones - AIG Total Return Index (DJ-AIG)	-6.57%	-8.12%	-36.20%
GSCI Total Return Index (GSCI)	-13.78%	-19.66%	-48.25%
Reuters Jefferies CRB Index (RJCRB)	-5.01%	-5.93%	-28.37%
Rogers International Commodity Index (RICI)	-6.48%	-10.63%	-36.94%
S&P Commodity Index (SPCI)	-10.98%	-12.21%	-37.57%

Source: Akey (2007).

B. Commodity Indices

Performance attribution

- **Spot return**
- **Roll yield**
- **Interest on collateral**



Source: Schwab (2007).

B. Commodity Indices

Economic Sources of Return

- **Term structure**
- **Rebalancing**
- **Rare trend shifts in spot prices**

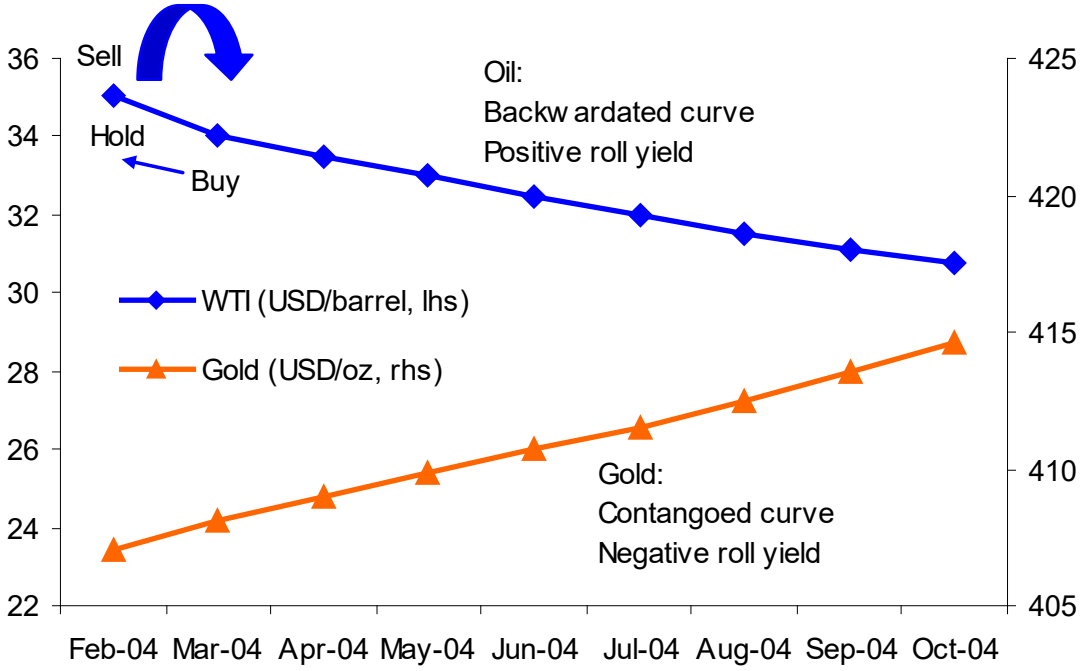
Source: Till (2006).

B. Commodity Indices

Economic Sources of Return (Continued)

Term Structure of Commodities Futures Contracts

Crude Oil and Gold Example



Source: Lewis (2007).

B. Commodity Indices

Economic Sources of Return (Continued)

Rebalancing

- **Erb and Harvey (2006) examine the returns of sixteen commodity futures contracts over the period, 1982 to 2004.**

- **The average correlation of individual commodities with one another was quite low: only about 9%.**

B. Commodity Indices

Economic Sources of Return (Continued)

Rebalancing

- **The average standard deviation of the commodities that they studied was 25%. It turns out that combining lowly correlated, highly volatile instruments can result in additional index-level returns.**

B. Commodity Indices

Economic Sources of Return (Continued)

Rebalancing

- **Erb and Harvey show mathematically that "when asset variances are high and correlations are low," the diversification return from rebalancing can be high.**

B. Commodity Indices

Economic Sources of Return (Continued)

Rebalancing

- **For example, "for an equally weighted portfolio of 30 securities with average *individual* security standard deviations of 30 percent a year and average security correlations ranging from 0.0 to 0.3, the diversification return [alone] ranges from 3.05 percent to 4.35 percent."**

- **This return is separate from any returns due to each individual commodity within the index.**

B. Commodity Indices

Economic Sources of Return (Continued)

Rebalancing

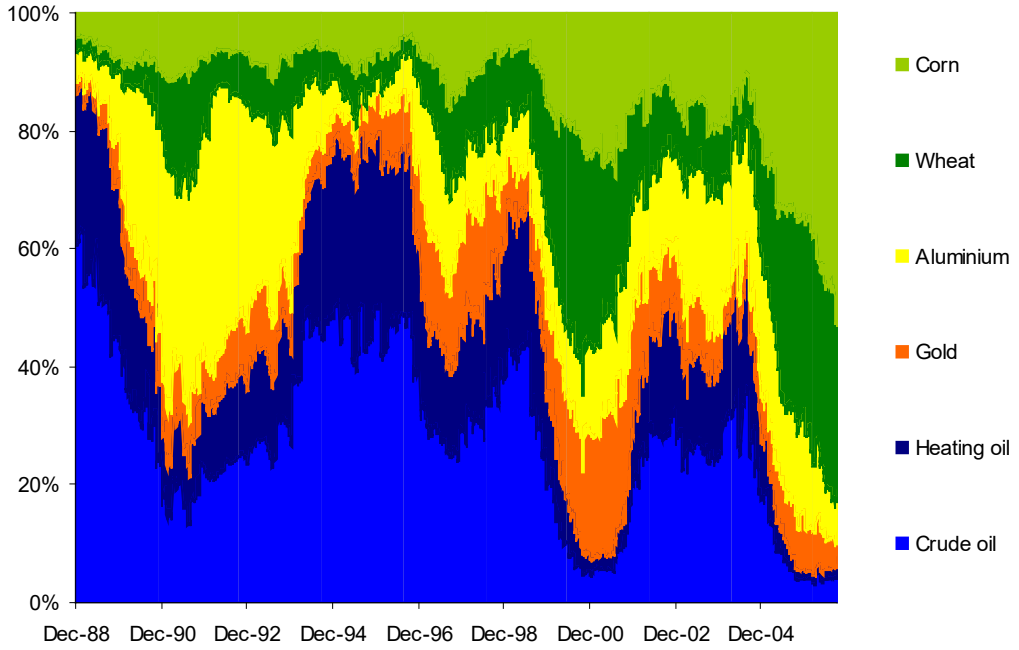
- **So even if the *individual* futures contracts in an equally-weighted index have returns that oscillate around zero, the rebalancing effect plus collateral returns can add up to meaningful numbers.**

B. Commodity Indices

Economic Sources of Return (Continued)

Rebalancing

Commodity Weights of the
Deutsche Bank Liquid Commodity Index – Mean Reversion



Source: Lewis (2007).

B. Commodity Indices

Economic Sources of Return (Continued)

Rare Trend Shifts in Spot Prices …

- **… can also be a meaningful source of return.**

- **We will cover this topic further during the Commodity Outlook session.**

B. Commodity Indices

Index Limitations

- **Index disparities**
- **Downside volatility**
- **Unexploited opportunities**

Source: Akey (2007).

B. Commodity Indices

Index Limitations (Continued)

Index disparities

- **The differences in market and sector weightings and roll methodologies can have a substantial impact on how each index performs, as shown previously.**

Source: Akey (2007).

B. Commodity Indices

Index Limitations (Continued)

Downside Volatility

- **Commodities markets can have immense volatility, which is a function of their response to short-term supply/demand imbalances more so than any longer term macroeconomic conditions.**

Source: Akey (2007).

B. Commodity Indices

Index Limitations (Continued)

Downside Volatility

- **Natural gas provides one recent real-time example of this phenomenon, trading above $15/MmBtu briefly in December 2005, but retracing to around $7/MmBtu in May 2006.**

Source: Akey (2007).

Source: www.futuresource.com.

B. Commodity Indices

Index Limitations (Continued)

Downside Volatility

- **Passive, long-only indexes have little protection from these downward spikes or trends.**

Source: Akey (2007).

B. Commodity Indices

Index Limitations (Continued)

Unexploited Opportunities

- **Opportunities related to cyclicality, seasonality, cross-correlation and weather premiums all present tactical trading scenarios that an index cannot exploit.**
  - **For example, agricultural commodities typically demonstrate active price volatility during only a few key months of the year, when the market is adapting to potential crop yields for that year.**

Source: Akey (2005).

B. Commodity Indices

Index Limitations (Continued)

Other Markets

- **Water**
- **Coal**
- **Forestry Products**
- **Electricity/Utilities**
- **Emissions**
- **Shipping/Transport**
- **Other Materials (e.g., Steel)**
- **Resource Infrastructure**

Source: Akey (2005).

C. Active Commodity Futures Programmes

Active commodity strategies …

- **… Can be used as a satellite to an investor's core exposure to commodities.**
  - **Core exposure obtained through commodity index investment.**
  - **With commodity indexes, an investor obtains consistent exposure to the inherent returns of the asset class.**

Source: Till and Eagleeye (2006).

C. Active Commodity Futures Programmes

- **No guarantee that a manager will remain consistently long of commodities.**
- **A core risk management principle for most hedge funds is that total risk should be managed by neutralizing systematic risk through hedging.**
- **This can mean that an active commodity manager may not be positioned for a commodity price spike, precisely when this would be most beneficial for an investor's overall portfolio.**

C. Active Commodity Futures Programmes

- **Benefits**
- **Limitations**
- **Structural Sources of Return**

C. Active Commodity Futures Programmes

Benefits

- **Investors may be able to source skilled commodity managers who can achieve superior returns with acceptable risk.**

Active Commodity Futures Traders Returns
(January 1991 through November 2004)

Compound Annual Return	Annualized Standard Deviation	Sharpe Ratio	Worst Draw-Down
20.99%	10.48%	1.63	-8.49%

Data Source: Excerpted from Akey (2005), Figure 19.

C. Active Commodity Futures Programmes

Benefits

- **Evidence that active manager returns were likely not related to commodity index exposure:**

Correlation of Monthly Returns
Active Commodity Futures Traders vs. Passive Indices
(January 1991 through November 2004)

	CRBR	DJAIG	Active Portfolio	GSCI	RICI	SPCI
CRBR	1.00					
DJAIG	0.82	1.00				
Active Portfolio	0.25	0.26	1.00			
GSCI	0.65	0.89	0.18	1.00		
RICI	0.72	0.90	0.25	0.92	1.00	
SPCI	0.81	0.91	0.22	0.87	0.82	1.00

Abbreviations:

CRBR: Commodities Research Bureau – Reuters Total Return Index;
DJAIG: Dow Jones – AIG Commodity Index;
GSCI Goldman Sachs Commodity Index;
RICI: Rogers International Commodity Index; and
SPCI: Standard and Poor's Commodity Index.

Data Source: Akey (2005), Figure 22.

C. Active Commodity Futures Programmes

Limitations

- **Scalability**
  1. **Capacity constraints**
     - **Can't all profit from exploiting inefficiencies**

  2. **Speculative position limits**
     - **Impose a cap on the size of the net position that speculators may hold overnight in a single contract month and in all contract months of a particular commodity.**

- **The use of over-the-counter transactions can increase the capacity of strategies.**

C. Active Commodity Futures Programmes

Structural Sources of Return

- **Hedge pressure**
- **Scarcity**
- **Weather-Fear Premia**

C. Active Commodity Futures Programmes

Structural Sources of Return (Continued)

Hedge pressure

- **There is a persistent return from taking a position on the other side of commercial hedge pressure.**

C. Active Commodity Futures Programmes

Structural Sources of Return (Continued)

Hedge pressure

- **In some commodity futures markets, producers are in a more vulnerable position than consumers and so will be under more pressure to hedge than consumers.**

C. Active Commodity Futures Programmes

Structural Sources of Return (Continued)

Hedge pressure

- **Examples: Live Cattle and Gasoline**

- **There appears to be a systematic positive return due to a congenital weakness on the demand side for hedging.**

C. Active Commodity Futures Programmes

Structural Sources of Return (Continued)

Hedge pressure

- **Example: Grain Markets**
- **Historically, there have been seasonal times when commercial hedging tends to be long rather than short.**
- **Therefore, one might expect that in order to capture the gains from being on the other side of commercial hedge pressure, there are times when an investor's positioning needs to be from the short side rather than from the long side.**

C. Active Commodity Futures Programmes

Structural Sources of Return (Continued)

Hedge pressure

- **Bessembinder (1992) provided empirical evidence that this is the proper way to approach the grain markets.**

Mean returns (% per day * 250) in Selected Futures Markets

	Conditional on net hedging	
	Short	Long
Soybeans	4.35%	-1.21%
Wheat	5.71%	-10.53%
Corn	16.25%	-19.96%

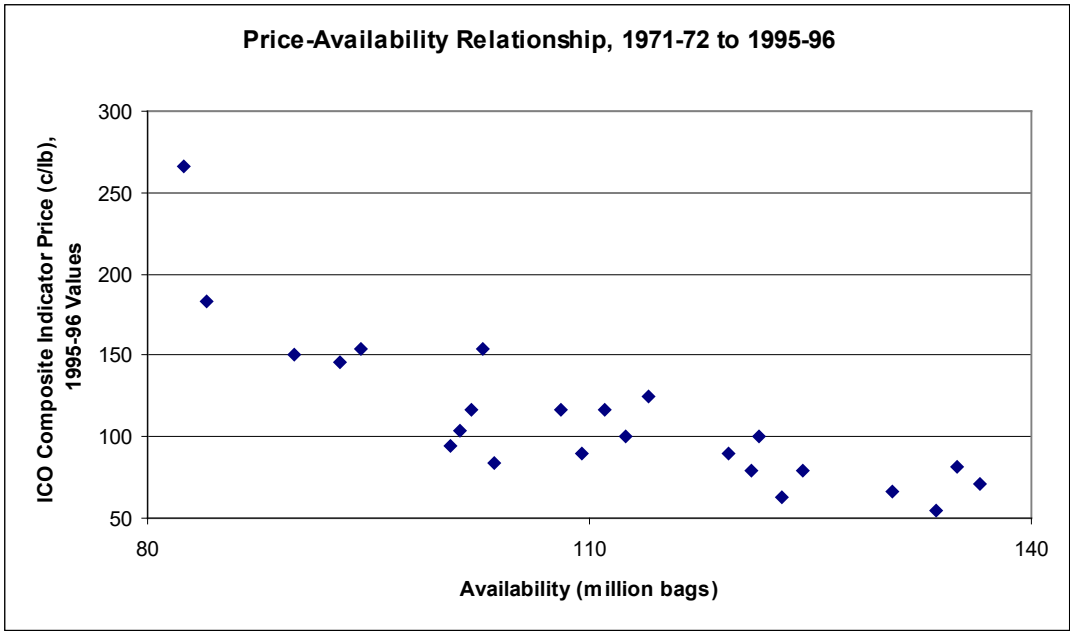
Source: Excerpted from Bessembinder (1992), Table 1.

C. Active Commodity Futures Programmes

Structural Sources of Return (Continued)

Scarcity

Coffee Supply/Usage Example



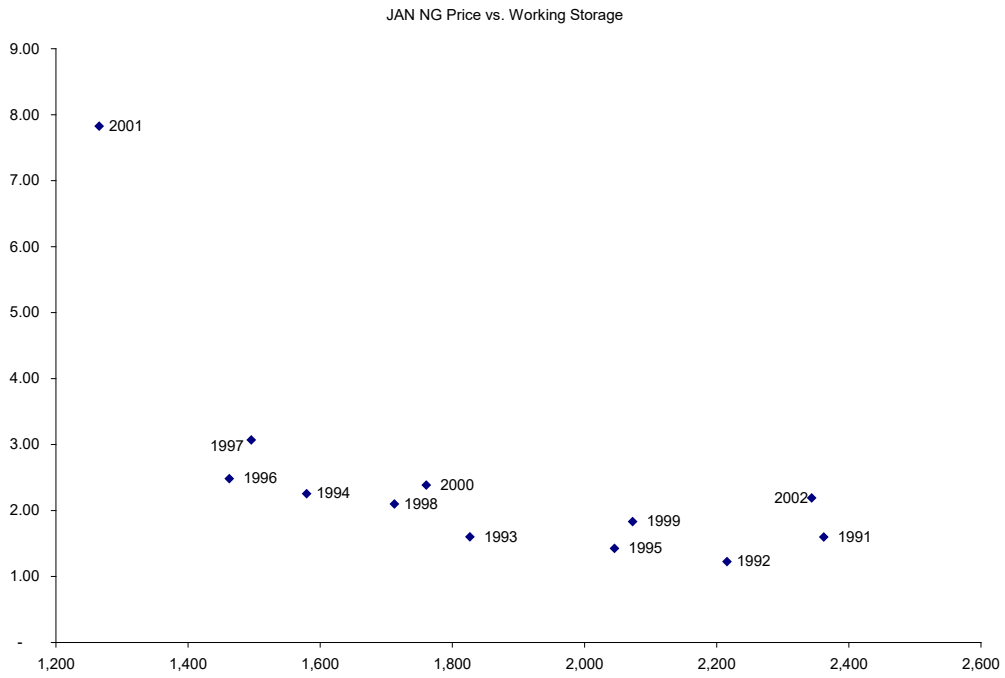
Source: Gilbert and Brunetti (1997), as cited in Till and Eagleeye (2003).

C. Active Commodity Futures Programmes

Structural Sources of Return (Continued)

Scarcity

Natural Gas Supply/Usage Example



Source: Huggins (2002), as cited in Till and Eagleeye (2003).

C. Active Commodity Futures Programmes

Structural Sources of Return (Continued)

Weather-Fear Premia

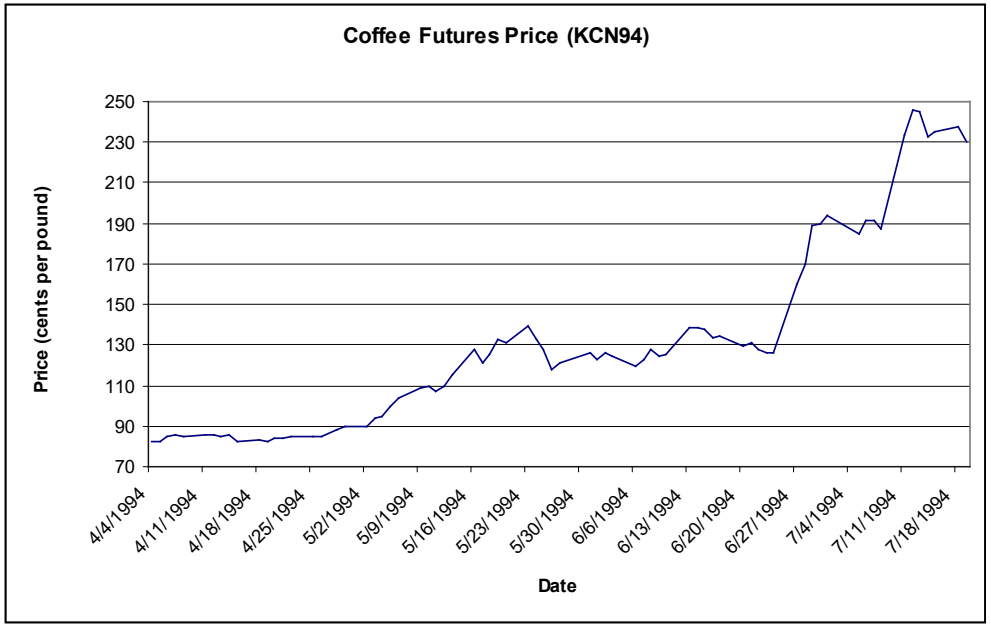
- **A futures price will sometimes embed a fear premium due to upcoming, meaningful weather events that can dramatically impact the supply or demand of a commodity.**

C. Active Commodity Futures Programmes

Structural Sources of Return (Continued)

Weather-Fear Premia

- **Example: Coffee**
- **This illustrates the risk of a short position in coffee if such a position is held during the Southern Hemisphere winter.**



Source: Till and Eagleeye (2006).

C. Active Commodity Futures Programmes

Structural Sources of Return (Continued)

Caveat: Past Performance is No Guarantee of Future Success

- **As strategies become well-known, their future returns may be dampened or even eliminated.**
- **Example: The Equity Book/Market Premium.**
- **However, other well-published market inefficiencies continue to exist.**
- **Example: The Fixed-Income Liquidity Premium.**

C. Active Commodity Futures Programmes

Structural Sources of Return (Continued)

Caveat: Past Performance is No Guarantee of Future Success

- **The weather-fear premia could diminish …**

- **… if improvements in forecasting reduced weather uncertainty.**

C. Active Commodity Futures Programmes

Structural Sources of Return (Continued)

Caveat: Past Performance is No Guarantee of Future Success

- **Also, if there are changes in where a crop is predominately produced, this can change the timing of when the weather-related premia will be most pronounced.**

- **Examples:**
  - **Soybean production (Latin America / US); and**
  - **Coffee production (Vietnam / Brazil).**

References

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