Crude Oil Poor Financial Market Lubricant

Fashion and style are two different things. It has been said you can look at a centuries-old portrait and have no idea whether the subject's clothes were in fashion, but you most certainly will know whether the person had style.

Markets run in fashions, too. Let's take a two-decade old example, the chain of causation for the 1987 market crash as described by John Murphy in his 1991 book *Intermarket Technical Analysis*. Murphy described how dollar weakness led to higher commodity prices, which signaled higher inflation, which in turn led to higher short- and long-term interest rates and eventually to the stock market crash.

At the time the book was published, no one raised an eyebrow at this sound description. However, if you used it as a trading guide between 2005 and 2008, you would have lost a lot of money as bond yields fell even as the dollar weakened and commodity prices hit a series of new highs. Did those lower bond yields support equities? Hardly; 2008 ended with four-week Treasury bills being auctioned for 0.0000% while stocks had their worst year since the Great Depression. Murphy's original analysis demonstrated he had style, but the market dictated his original conclusions were out-of-fashion.

Out Of Fashion, Out Of Style
Occasionally there is an idea so simple, so clean, so intuitively appealing that is just has to be wrong. Take the idea crude oil and U.S. equity prices are correlated negatively, please. It is easy to see how this idea came into being. Both of the oil shocks of the 1970s led to recessions and downturns in the stock market, as did the first Persian Gulf War. But for a relationship to be valid and causal, it must apply in all market conditions or, at the very minimum, be operative but overwhelmed by other primal market factors in times where the relationship is not particularly apparent.

Those who belief crude oil and U.S. equities are negatively correlated have to ignore periods such as 1989, when the two rose in lockstep over the first half of the year, or 2005 through October 2007, when both markets were rising simultaneously. Both markets declined together brutally during the second half of 2008. If we look at the two markets on a total return basis, using the Dow Jones-AIG total return index for continuously rolled crude oil futures and the S&P 500 total return index, we see a near-constant history of positive correlation. The only period of pronounced divergence, October 2007 – July 2008, marked with a green rectangle, coincided with an unusual set of circumstances. Stocks were pushed lower during this period while commodity prices in general surged for a variety of reasons (see "Deconstructing The Commodity Surge," November 2008). The green rectangle encompasses a mere 44 weeks out of 1,376 weeks in the sample.

Do These Look Negatively Correlated To You?
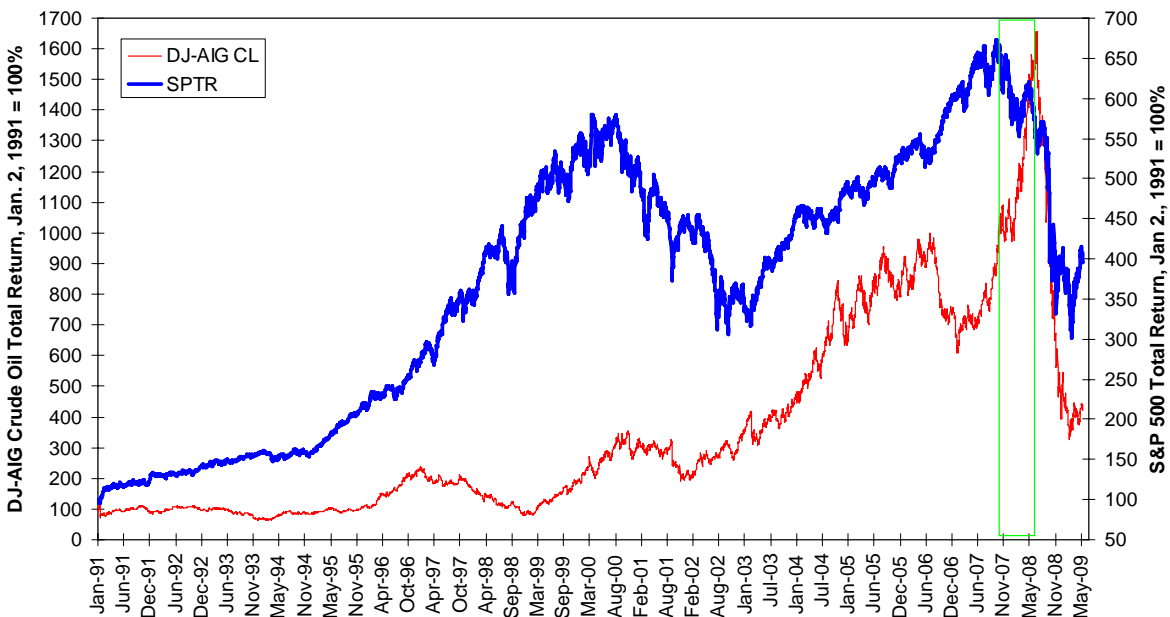
If we rearrange the data in the chart above into rolling 13-week correlations of return, we see just how often returns are correlated positively. The actual number is 697 positive correlations of return out of 1,376 thirteen-week segments, or 50.65%.
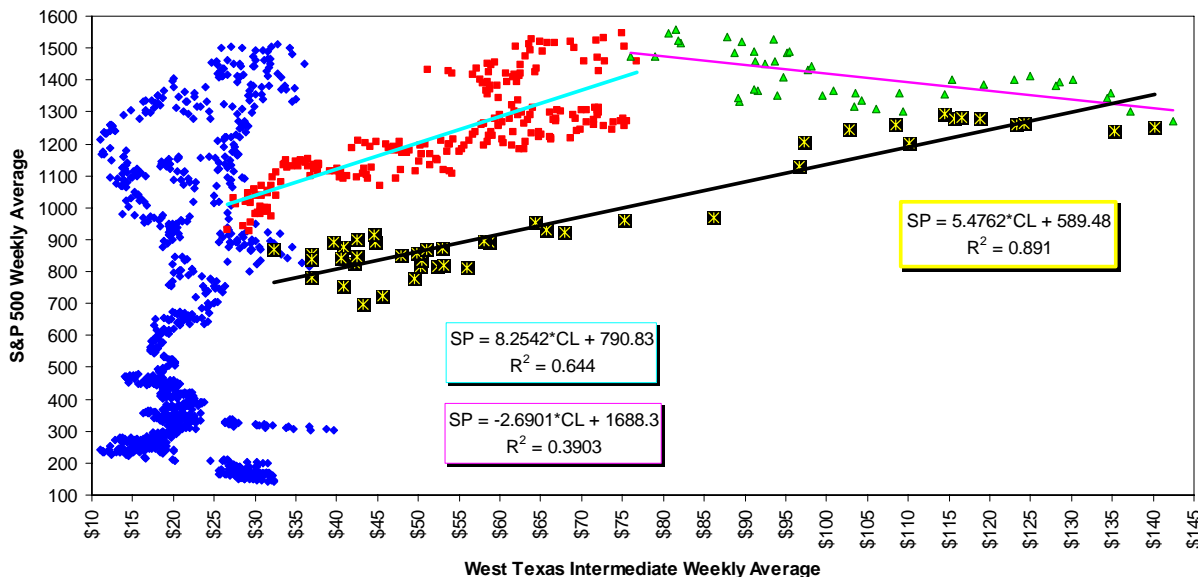
Rolling Thirteen-Week Correlation Of Weekly Returns
S&P 500 And Crude Oil Since January 1983
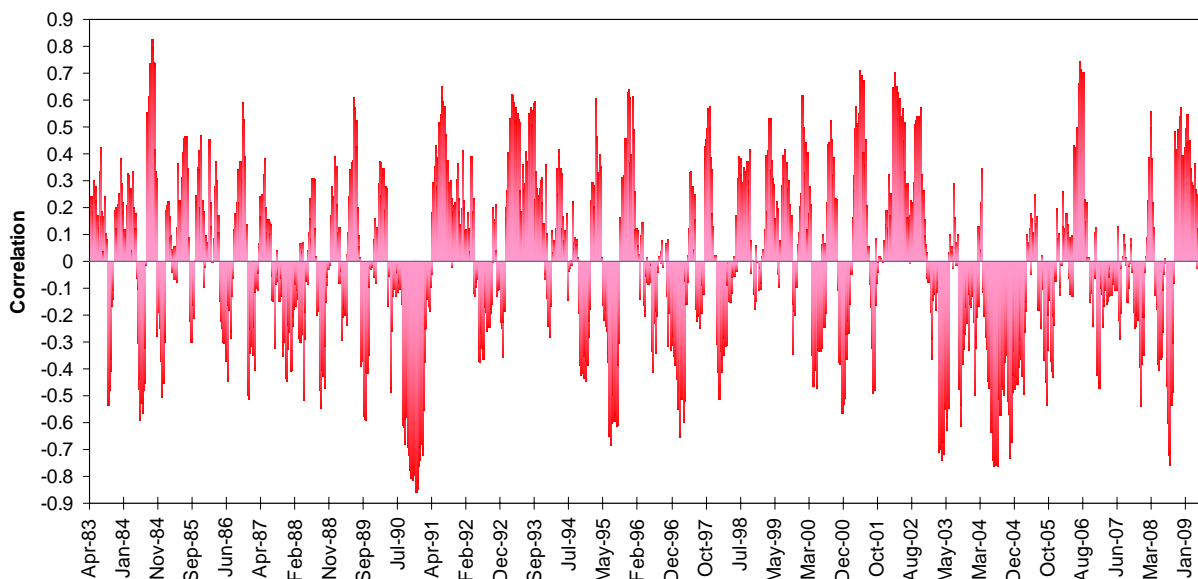
But even this does not tell the full story. If we take the history of weekly average S&P 500 cash prices and map them against the history of weekly average cash crude oil prices going back to the start of futures trading in 1983, we can see four distinct regimes.

The first, extending from January 7, 1983 to May 2, 2003 and marked in blue, was an essentially random relationship. The second, extending from May 9, 2003 to August 31, 2007, and marked in red with a turquoise trendline, was a positive relationship. The third, extending from September 7, 2007 to July 4, 2008 and marked in green with a magenta trendline, was a negative relationship. Finally, the period from July 11, 2008 onwards marked in black with a black trendline, was another period of positive relationship.

S&P 500 And Crude Oil:
Four Regimes Since 1983

$SP = 5.4762 * CL + 589.48$
$R^2 = 0.891$

$SP = 8.2542 * CL + 790.83$
$R^2 = 0.644$

$SP = -2.6901 * CL + 1688.3$
$R^2 = 0.3903$

Industry Group Impact

This long-term positive correlation is supported by several factors, not the least of which is both markets can be described as geometric Brownian motion processes with positive drift terms. This is a very fancy way of saying the best predictor of tomorrow's price is today's price plus a small error term that is on average positive. This positive drift term exists in stocks by virtue of the economy's long-term growth and in crude oil by virtue of the destructive nature of crude oil consumption. Unlike other commodities where a new crop can be grown or where the material can be recycled, crude oil is extracted from the ground without replacement or recycling. This leads to diminishing returns on investment and a positive long-term trend in price.

A second reason is both markets prosper when the global economy is growing. As we saw during the 1997-1998 Asian/Russian/LTCM crises and again in 2008, the income elasticity of demand for crude oil is high. Strong growth pulls both markets higher, and vice-versa.

The third reason is a little more complex, but it is irrefutable quantitatively. If we construct relative performance indices of each one of the S&P 500's industry groups against the S&P 500 itself and regress these series' returns against the returns for crude oil, we can construct lists of industry groups whose relative performance is a statistically significant, here a 90% confidence level, function of crude oil prices. If we then weight those relative performance betas by each group's weight within the S&P 500, we can derive a net weighted impact.

The conclusion has been the same for years: While a very large number of industry groups, here 51 out of 134 accounting for 56.82% of the S&P 500's market capitalization, have a statistically significant negative relative performance beta against crude oil, the net weighted beta is only -3.26%. Contrast this to the positive side of the ledger; here 28 groups accounting for only 20.88% of the S&P 500's capitalization have a net weighted beta of 3.54%. The net impact is a positive 0.28%; each 1% change in the price of crude oil should have a positive partial contribution of 0.0028% to the S&P 500, all else held equal.

The logic is simple: The industry groups with a positive beta to crude oil have both high betas and large weights. For example, the integrated oil & gas group has a net weighted beta of 1.73%; the group with the largest negative weighted beta, pharmaceuticals, accounts for only -0.60%.

Crude Oil Beta-Weighted Impact On S&P 500

	SPX Weight	CL Beta	Weighted Beta		SPX Weight	CL Beta	Weighted Beta
Pharmaceuticals	7.51%	0.080	-0.60%	Integrated Oil & Gas	8.27%	0.210	1.73%
Hypercenters & Superstores	1.66%	0.134	-0.22%	Oil & Gas Equipment	1.62%	0.389	0.63%
Household Products	2.69%	0.081	-0.22%	Oil & Gas Exploration	2.16%	0.156	0.34%
Soft Drinks	2.34%	0.076	-0.18%	Diversified Metals & Mining	0.25%	0.406	0.10%
Healthcare Equipment	2.19%	0.076	-0.17%	Oil & Gas Drilling	0.21%	0.431	0.09%
Computer Hardware	4.60%	0.036	-0.16%	Investment Banking & Brokerage	1.49%	0.044	0.07%
Biotech	1.85%	0.080	-0.15%	Construction & Farm Machinery	0.73%	0.087	0.06%
Systems Software	3.29%	0.042	-0.14%	Oil & Gas Refining	0.22%	0.281	0.06%
Tobacco	1.77%	0.074	-0.13%	Steel	0.27%	0.211	0.06%
Packaged Foods	1.54%	0.072	-0.11%	Life & Health Insurers	0.97%	0.055	0.05%
Integrated Telecommunications	3.25%	0.031	-0.10%	Gold	0.27%	0.194	0.05%
Restaurants	1.14%	0.085	-0.10%	Fertilizers & Agricultural Chemicals	0.68%	0.069	0.05%
Aerospace & Defense	2.90%	0.029	-0.08%	Construction & Engineering	0.17%	0.230	0.04%
Air Freight & Logistics	1.08%	0.077	-0.08%	Specialized Finance	0.54%	0.054	0.03%
Drug Retailers	0.97%	0.071	-0.07%	Aluminum	0.11%	0.265	0.03%
Home Improvement Retailers	0.97%	0.072	-0.07%	Gas Utilities	0.16%	0.166	0.03%
Semiconductors	2.02%	0.031	-0.06%	Consumer Finance	0.60%	0.041	0.02%
Industrial Conglomerates	2.33%	0.020	-0.05%	Multiline Insurers	0.31%	0.071	0.02%
Electric Utilities	2.27%	0.019	-0.04%	Agricultural Products	0.21%	0.067	0.01%
Data Processing & Outsourcing	0.96%	0.046	-0.04%	Electrical Components & Equipment	0.46%	0.026	0.01%
Multiline Utilities	1.38%	0.031	-0.04%	Industrial Gases	0.45%	0.027	0.01%
Healthcare Services	0.73%	0.054	-0.04%	Wireless Services	0.34%	0.032	0.01%
Managed Health	1.08%	0.035	-0.04%	Broadcast & Cable TV	0.06%	0.112	0.01%
General Merchandise Retailers	0.48%	0.077	-0.04%	Paper Products	0.10%	0.061	0.01%
Food Retailers	0.37%	0.088	-0.03%	Casinos & Gaming	0.09%	0.063	0.01%
Healthcare Distributors	0.40%	0.078	-0.03%	Forest Products	0.09%	0.050	0.00%
Property & Casualty Insurers	0.89%	0.035	-0.03%	Tires & Rubber	0.04%	0.077	0.00%
Insurance Brokers	0.25%	0.095	-0.02%	Commercial Printers	0.03%	0.034	0.00%
Apparel Retailers	0.31%	0.070	-0.02%				
Thrifts & Mortgages	0.16%	0.119	-0.02%	Subtotal:	20.88%		3.54%
Department Stores	0.39%	0.042	-0.02%				
Environmental Services	0.32%	0.050	-0.02%				
Food Distributors	0.17%	0.079	-0.01%				
Computers & Electronics Retailers	0.24%	0.053	-0.01%				
Airlines	0.07%	0.184	-0.01%	Total:	77.70%		0.28%
Specialty Stores	0.23%	0.046	-0.01%				
Apparel & Accessories	0.19%	0.056	-0.01%				
Application Software	0.47%	0.022	-0.01%				
Specialty Chemicals	0.18%	0.056	-0.01%				
Footwear	0.26%	0.037	-0.01%				
Leisure Products	0.10%	0.080	-0.01%				
Metal & Glass Containers	0.14%	0.053	-0.01%				
Distributors	0.07%	0.099	-0.01%				
Trading Companies	0.12%	0.048	-0.01%				
Paper Packaging	0.07%	0.070	0.00%				
Brewers	0.08%	0.056	0.00%				
Distillers & Vintners	0.09%	0.047	0.00%				
Household Appliances	0.12%	0.032	0.00%				
Office Services & Supplies	0.10%	0.028	0.00%				
Home Furnishings	0.03%	0.045	0.00%				
Healthcare Facilities	0.01%	0.057	0.00%				
Subtotal:	56.82%		-3.26%				

There you have it: If you are long stocks, you should prefer higher, not lower, crude oil prices. This conclusion will never be in fashion; let's hope serious analysis never goes out of style.