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<http://seekingalpha.com/article/166656-correlations-between-oil-natural-gas-s-p500-and-alt-energy-stocks?source=yahoo>

Correlations Between Oil, Natural Gas, S&P500 and Alt Energy Stocks

Last week, I conducted an analysis showing the **lack of evidence supporting claims that oil and alt energy returns are strongly correlated** (claims that sometimes come from outfits as reputable as **Bank of America Merrill Lynch**). I don't want to belabor this topic but I thought I would post the results of another, similar analysis I conducted following comments I received on how to improve the first one. In a nutshell, the comments suggested I do the following:

- 1) Look at daily correlations or even smaller periods, as "common knowledge" market movements can often dominate over the real relationship in the short and very short run
- 2) Look at absolute (price) correlations as well as relative (return) correlations (my first analysis looked only relative)
- 3) Look at directionality (i.e. what % of the time do assets X and Y move in the same direction regardless of the size of the move)
- 4) Extend your analysis to five years or greater

New Analysis, Same Difference

The three sets of tables below show daily return correlation coefficients, daily price correlation coefficients and daily directionality statistics (% of days that the assets close Up, Down or No Movement together) for oil, nat gas, the S&P 500 and alt energy stocks.

The time periods have been extended from three to five years or since inception. The oldest alt energy ETF available is **PBW** that was listed on March 03, 2005 - not quite 5 years but a decent chunk of time nonetheless. The other 3 ETFs (sector specific) were all listed in the 2nd half of 2008.

		Correlation Coefficients (Daily Returns)					
		S&P 500	PTRP	TAN	FAN	PBW	Nat Gas
US Oil	5 yr	0.24	n/a	n/a	n/a	0.30	0.31
	3 Yr	0.30	n/a	n/a	n/a	0.33	0.29
	2 Yr	0.32	0.40	0.38	0.46	0.35	0.30
	LTM	0.43	0.38	0.41	0.47	0.42	0.25

		Correlation Coefficients (Daily Returns)					
		S&P 500	PTRP	TAN	FAN	PBW	US Oil
US Nat Gas	5 yr	0.08	n/a	n/a	n/a	0.12	0.31
	3 Yr	0.10	n/a	n/a	n/a	0.12	0.29
	2 Yr	0.12	0.20	0.22	0.24	0.15	0.30
	LTM	0.17	0.19	0.22	0.25	0.19	0.25

		Correlation Coefficients (Daily Returns)					
		Nat Gas	PTRP	TAN	FAN	PBW	US Oil
S&P 500	5 yr	0.08	n/a	n/a	n/a	0.81	0.24
	3 Yr	0.10	n/a	n/a	n/a	0.83	0.30
	2 Yr	0.12	0.45	0.76	0.84	0.84	0.32
	LTM	0.17	0.44	0.79	0.85	0.88	0.43

		Correlation Coefficients (Daily Prices)					
		S&P 500	PTRP	TAN	FAN	PBW	Nat Gas
US Oil	5 yr	0.40	n/a	n/a	n/a	0.57	0.45
	3 Yr	0.42	n/a	n/a	n/a	0.61	0.76
	2 Yr	0.81	0.71	0.96	0.96	0.81	0.87
	LTM	0.75	0.72	0.78	0.78	0.81	-0.12

		Correlation Coefficients (Daily Prices)					
		S&P 500	PTRP	TAN	FAN	PBW	US Oil
US Nat Gas	5 yr	0.44	n/a	n/a	n/a	0.48	0.45
	3 Yr	0.60	n/a	n/a	n/a	0.69	0.76
	2 Yr	0.73	-0.31	0.90	0.74	0.75	0.87
	LTM	-0.11	-0.44	0.18	-0.32	-0.13	-0.12

		Correlation Coefficients (Daily Prices)					
		Nat Gas	PTRP	TAN	FAN	PBW	US Oil
S&P 500	5 yr	0.44	n/a	n/a	n/a	0.92	0.40
	3 Yr	0.60	n/a	n/a	n/a	0.94	0.42
	2 Yr	0.73	0.87	0.97	0.96	0.98	0.81
	LTM	-0.11	0.90	0.79	0.91	0.92	0.75

		Directionality (% of Time Assets Move in Same Direction)					
		S&P 500	PBW	FAN	TAN	PTRP	Nat Gas
US Oil	5 yr	53%	55%	n/a	n/a	n/a	63%
	3 Yr	56%	57%	n/a	n/a	n/a	60%
	2 Yr	58%	60%	70%	64%	54%	64%
	LTM	67%	67%	73%	68%	54%	62%

		Directionality (% of Time Assets Move in Same Direction)					
		S&P 500	PBW	FAN	TAN	PTRP	US Oil
US Nat Gas	5 yr	50%	51%	n/a	n/a	n/a	63%
	3 Yr	50%	52%	n/a	n/a	n/a	60%
	2 Yr	50%	54%	56%	58%	46%	64%
	LTM	52%	58%	57%	60%	44%	62%

		Directionality (% of Time Assets Move in Same Direction)					
		Nat Gas	PBW	FAN	TAN	PTRP	US Oil
S&P 500	5 yr	50%	74%	n/a	n/a	n/a	53%
	3 Yr	50%	77%	n/a	n/a	n/a	56%
	2 Yr	50%	79%	81%	72%	57%	58%
	LTM	52%	83%	83%	76%	56%	67%

The first set of tables show that returns on oil are not particularly useful at explaining returns on alt energy stocks on a daily basis (let's say that we enter *useful* territory at 0.5 and above), although the results for **PBW** show the relationship strengthening somewhat in the last year (which has been anything but a normal year for the markets). These results are in line with those from my [previous analysis](#) which looked at weekly returns.

As far as absolute prices go (the second set of tables), correlation coefficients for oil and alt energy are high, but they are just as high if not higher for alt energy and the S&P 500. PBW shows the relationship strengthening over time, but it strengthened even more between oil and the S&P 500, something Tom opined [might be the case a few months ago](#).

I don't find absolute price correlations all that useful. In the medium and long terms, returns matter far more than absolute prices. If a \$1 movement in oil consistently results in a \$1 movement in an alt energy ETF over the long run, the high coefficient could obscure a divergence trend between the returns on both assets as their prices rise.

Finally, the directionality tables (note that assets appear in a different order) show a fair bit of co-directionality between oil and alt energy (with the exception of [PTRP](#) [alternative transportation], something [Tom and I discussed last week](#)). But here again, the S&P 500 emerges as the stronger predictor.

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