

Natural Gas Spread Trading

IT IS STATISTICAL ARBITRAGE IN NATURE, BY CALCULATING AND IDENTIFYING STATISTICAL MISPRICING IN THE FORWARD CURVE.

I follow a disciplined research process which relies on the application of advanced quantitative methods. While research process frequently yields promising investment ideas, only a small number of these are based on viable premises. If new ideas fail to withstand a scientific evaluation of their merits, they will be rejected.

Strategy profile

Date created: 2017

Frequency	Long-Term (Avg trade duration 45 days)
Key Idea	Trading signals are primarily a function of supply and demand dislocations driven by seasonality and weather conditions, implied storage costs, idiosyncratic events (e.g., price shocks), and increasing/realizing convenience yields.
Capacity	20.0m USD
Execution Latency	Positions are opened/closed in the middle of session with limit orders.
Monthly trades quantity	3 rounds a month on average

My competitive advantage

- **Key differentiators:** Strategy rejects the Efficient Market Hypothesis. I do not believe that returns follow strict random walks and that assets are perfectly priced at all times. Model's approach to investing begins with a thorough examination of a variety of factors (Fundamental and Statistical price data) that may cause markets to move, followed by an investigation of all detected anomalies and unusual market patterns.

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- The factors added to model are quantified and preprocessed data from this resources:
 - **CFTC**
 - Actual: https://www.cftc.gov/dea/options/nat_gas_lof.htm
 - Historical data: <https://data.nasdaq.com/>
 - **Weather conditions**
 - Actual: <https://earth.nullschool.net/>
 - Actual: <https://www.cpc.ncep.noaa.gov/products/predictions/814day/>
 - Historical data: colleague shared with me datasets for backtesting privately
 - **Implied storage costs**
 - Actual: <https://ir.eia.gov/ngs/ngs.html>
 - Historical data: <https://ir.eia.gov/ngs/cvhistory.xls>
 - **Supply and demand dislocations**
 - Actual prices :<https://www.eia.gov/todayinenergy/prices.php>
 - Actual Export data: https://www.eia.gov/dnav/ng/ng_move_expc_s1_m.htm
 - Actual Import data: https://www.eia.gov/dnav/ng/ng_move_imp_c_s1_m.htm
 - Historical data: <https://www.eia.gov/dnav/ng/hist/rngwhhdM.htm>
 - **Idiosyncratic events (e.g., price shocks)**
 - Actual pipeline map: <https://www.eia.gov/state/maps.php?v=Natural%20Gas>
 - RT News feed: https://twitter.com/NRG_Trng
 - **Price data**
 - Historical data: I have > 20 TB own of historical market data collected. (Stocks, Futures, Options, FX, Crypto, Spreads) for 15+ years depth. En testing.
 - Actual data: <https://www.bloomberg.com/account/signin>
 - Actual data: <https://iqfeed.net/>

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Strategie Statistics

	Value	Notes and Links
Suggested Minimum Cap	250 000 USD	
What it trades	Spreads	
Avg trade duration	45 days	
Max peak-to-valley drawdown	20%	
Drawdown period	4.0 month	
Annual Return (Compounded)	27%	
Avg win	NaN USD	per 1 spread*
Avg loss	NaN USD	per 1 spread
Piramiding	Yes	
Sharpe Ratio	1.51	
Win / Loss ratio	73.7%	

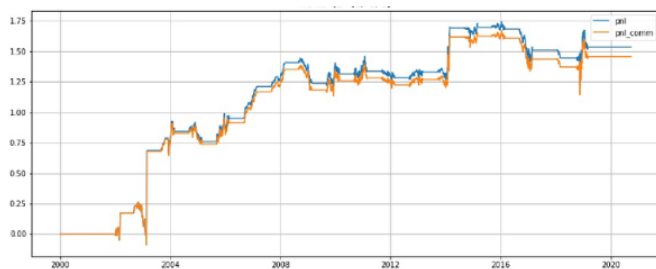
- **While the Strategy may combine multiple spread positions per market, each individual trade is implemented as an intra-market calendar spread. However, additional spreads may be used to hedge existing positions or reduce the exposure to adverse changes in the forward curve.*

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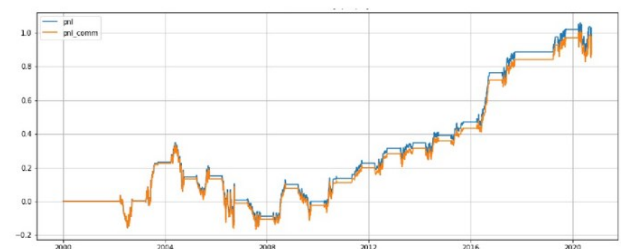
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Statistical data diagrams for some spreads

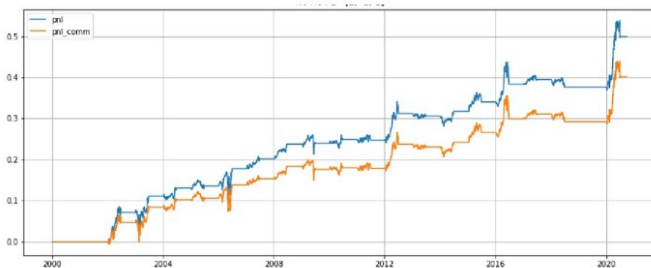
Equity Curve: 2000 to 2020



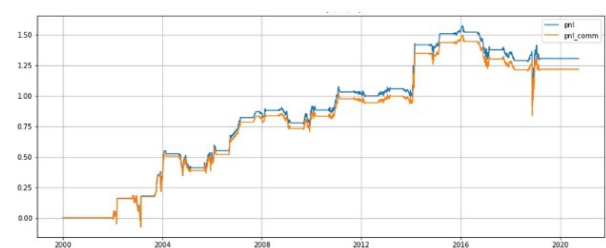
Equity Curve: 2000 to 2020



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Equity Curve: 2000 to 2020



This is historical **backtests** Up to from 2000 to 2020 trade to trade basis. Based on EOD modelling on Settle prices. No intraday data used.

Spread can consist from simple calendar 2 legs spread up to 6 legs and will be executed through merging synchronically 2 different combinations of legs in one risk profile. Here are some spreads backtests samples below.

Each of them has its own seasonality and price ranges to enter and exit. + radically different risk profiles because in some cases selling the nearest expiration leg can be too risky.

Calculation based on CONTRACT UNIT 1.0 to 10 000 U.S. dollars and cents per MMBtu.