Electricity Trading: An Opportunity For Hedge Funds To Offer True Alpha

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In this week's piece, I'd like to follow up on my active management investment philosophy and hedge fund investment philosophy by providing an example of a market that I believe is a great fit and a natural alpha driver. This market is the wholesale electricity market. I will focus this piece on the US power markets specifically, because I actively traded this market myself from 2014 to 2018. There is, however, also active trading in the European power markets.

Market Basics

Firstly, a few market basics, acronyms and definitions:

Independent Operations Systems (ISOs)

These are non-profit organizations that oversee the running of the electricity grid. There are about 7 ISOs including PJM [Chicago to New Jersey and down to North Carolina], MISO [Midwest], CAISO [California], NYISO [New York], NEPOOL [New England], ERCOT [Texas] and AEISO [Alberta].

Day Ahead (DA) market & Real Time (RT) market

The RT market is the real-time prices that are occurring within the grid now/today.

The DA market looks at the next day's variables and submits a price they want to lock in for the next day. This bid/commitment gets locked in today for tomorrow's RT market prices.

Local Marginal Price (LMP)

The price of electricity is made up of 3 components: Grid-wide energy price, individual congestion component and cost of marginal losses. The latter is quite a small component and so I will focus on the first two components. The energy price affects the whole grid and is tied to the general health of the grid at that point in time. The congestion component has a different effect on each node/pricing point depending on what part of the grid is currently congesting.

Why is the Electricity Market Inefficient?

There are a number of reasons the US power markets are inefficient. Some include:

1. Largest Market Participant

The largest market participant(s) are the Utility companies. Utility companies engage within the market in order to hedge their retail customer contracts. They make their money on the spread between the wholesale market and the retail market. They do not speculate within the wholesale markets which leads to pricing inefficiencies for financial speculators.

2. Old & Costly Infrastructure

Building and retiring electricity infrastructure is costly and time consuming. There are numerous old, inefficient generation plants which should retire but new construction of more efficient plants takes considerable time and money. There is a similar relationship with the transmission system that carries the electricity from the generation plants to the demand areas.

3. Unique Commodity Characteristic

Electricity has a unique characteristic relative to other commodities which is the inability to be stored. Within the grid, there is a constant sensitive demand and supply equilibrium required where any shocks or sudden changes to either side cause a sharp short-term price correction.

Demand Side

4. Unpredictable Weather Patterns

Demand is primarily driven by air conditioning units and heaters; these are highly sensitive to weather components like temperature, dew point, snow/rain and cloud

cover.

Almost everyone, knows we cannot trust what the weather forecast says. There are often large discrepancies between what the weather models are forecasting, even in the short-term, and what is realized; this means that the biggest driver on the demand side of the equation is unpredictable and due to the point above, this can have significant price effects on short-term prices.

Supply Side

5. Unpredictable Weather Patterns

There are a number of different types of fuels for the generation plants around the grid. Each of these fuel types have pros and cons. Fuel types include nuclear, coal, natural gas, solar, hydro and wind.

Although the move for increased renewable-fueled electricity is positive for the environment, it does lead to inefficiencies within the grid which can cause sharp price movements. The demand curve is relatively consistent; however, supply coming from renewable sources is volatile (due to weather uncertainty) and cannot be just turned on when needed (it cannot be stored). In terms of an example, let's say we are mid-summer and the temperature is high, so demand is increasing as our AC units need to work hard to keep the room/building cool. During this demand increase, wind strength may naturally be lowering. This is causing a negative effect as not only is demand increasing, but supply is decreasing which means we now need a more expensive supply to turn on to make up the shortfall from the natural wind level dropping. This is a similar argument to solar power; whether there is cloud cover or not is naturally down to the weather, and a sunny day turning cloudy as demand is increasing does happen (and vice versa). The downside of hydro is a little different. The largest hydro unit (Bath County) is both a producer of electricity but also a user of electricity as they need to pump the water back up to the dam after its been dropped in order to produce electricity. Due to the size of the generation plant, when it is using electricity, it is adding a significant demand level on top of the natural grid demand level at that time.

Tradable Products & Types of Financial Companies

There are a number of different tradable products within the US power markets. They range from very short-term to longer-term, have different capacity levels and

clearing houses. An interesting point about the electricity products is that only one of their products can be traded via the traditional exchanges. The futures product is traded on the ICE. All the other products are traded directly with each ISO where the ISO oversees the trade clearing and collateral requirements and calls. This means that investors that are only within Futures products are not involved in this market.

Short-Term Products

Up-To-Congestion (UTC) & Virtuals

These are products where we lock in a price in the DA market for the next day's RT market. We make or lose the spread between the locked-in DA price and the RT price. We multiply that by the volume we locked in from the DA market and that is our profit or loss. These are hourly contracts and cannot be traded out of. The difference between the products is that the UTCs are a spread trade where you are guaranteed both sides. What this does is cancel out of grid-wide energy component and isolate the congestion component. The Virtual product is where you buy or sell one node [pricing point] and you are open to both the energy component and the congestion component.

Futures

This is the one product that can be traded via a traditional route – through ICE. It trades like any other commodity futures contract. What we are doing with this product is trading the end-of-day RT market price of the largest hub. The 'on-peak' time goes from 7am to 11pm. Price levels come out every 5 minutes through the day so as the day goes on, we get a better sense of where the average price will fall. The minimum increment is 5c and a $1 movement on the screen for 1 contract is good for $800 profit or loss. Unlike UTCs or Virtuals [yet another advantage of the above products], this is a zero-sum game. You are able to get in and out of positions in real time just like any other liquid futures contract.

Physical Flowing

ISOs are able to send and receive electricity to and from each other. Each ISO has their own import and export price and money can be made by flowing from a cheaper price in, for example, PJM to the higher price in MISO. You make or lose the spread of the import and export price multiplied by the volume you flow across. It is important to note that this is not a risk-free arb as there is a time period from when

you order the flow to when its actually sent. Each ISO has a different time requirement. From memory, you have to wait at least 20 mins to flow from PJM to MISO and 75 minutes from PJM to NYISO. What you are essentially doing is making a macro price prediction for soon into the future saying ‘this ISO is going to be pricing significantly higher than another ISO’.

All of the above are extremely capital efficient and highly profitable in terms of risk-reward however they are also highly capacity constrained. Mainly private funds will focus on the above products and hedge funds will focus on the below, higher capacity, products. Private funds can set up showing $1 million in assets and using lower collateral levels. I brought in a seven-figure trading profit using only six-figure collateral.

Medium-Longer Term Products

All of the below behave similarly; they just have different time-horizons of expiration. These products generate money a little differently. The above products make or lose money on the spread between the DA and RT market or just the RT prices. The longer-term contracts make money off the locked-in average DA price for the month and executes against the observed DA prices as they come out each day during the month/quarter or year.

Monthlies - FTRs/CRRs; different names depending on which ISO you are trading within. Month-long contracts.

Quarterlies – expire at the end of the quarter.

Annuals – expire at the end of the year.

Generally, hedge funds trade these products close around the $100 million to $150 million AUM mark.

Why the strong fit to the Investment Philosophy?

Now that I’ve gone through the market basics, the market’s inefficient characteristics and the tradable products, I want to circle back to why this market fits within my investment philosophy. I look for markets and strategies that bring in returns that are market-neutral to the traditional asset classes and are market-neutral to well-known factors like value and size. Qualitatively, I look for inefficient markets that do not take on directional bets and are taking advantage of structural

inefficiencies. Given the above information, I believe this is a match.

In addition, to ensure diversification for investors, I also look for markets that do not have ETFs or Indices. The US power market is one of those markets because you can't access returns from this market via an ETF. This means that investors in cheaper investment vehicles do not have [passive] exposure to returns driven by this market's fundamental drivers and do not have returns driven by the inefficiencies within this market.

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