WEATHER PRODUCTS

Part Two: Hurricanes and Equities – Cross Market Opportunities

Hedging Hurricane-Sensitive Stock Exposure with CME CHI Products

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Futures traders have traditionally taken their cues from events in the news. Markets in equities, commodities, and currencies stage their price moves in response to "what's happening" out there. It can be a riot, strike or explosion in a far away place; it can be a national election or a legislative vote.

The most obvious, but also the most mysterious, catalyst in the financial marketplace is the weather. Obvious, because we know that things that grow depend on it, and the demand for energy is closely tied to how hot or cold the weather is, or isn't. Mysterious, because weather everywhere may be familiar and repetitive, yet it can be so capricious, that forecasts are still only accurate for a week or so, despite the billions of research dollars that have been spent on developing dependable longer term predictions.

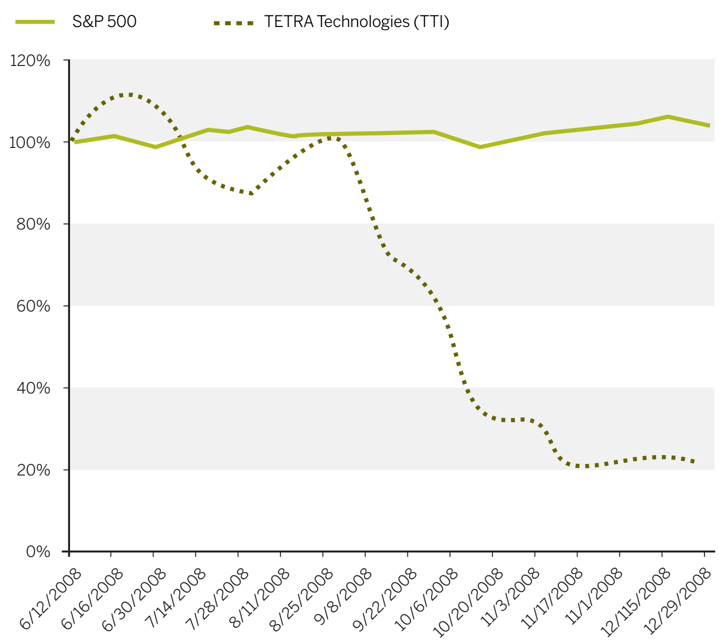
More mystery arises because weather's effects are not always obvious. For example, take the plunge in short term interest rates that baffled bond traders one afternoon in April 1982. This was during the Reagan administration when "supply side economics" was the buzz phrase *"du jour,"* and guessing the money supply number was one of Wall Street's favorite weekly games. The aggregate known as M1 measures all the cash in circulation, in checking accounts and demand deposit accounts. For a while, the money supply was considered to be the pulse of the economy. The expansion and contraction of M1 told traders how the Fed would, or might, react in response to short term credit needs. That puzzling M1 deficiency which spooked the bond traders that afternoon wasn't explained until the following day. It seems that a rare spring snowstorm was the culprit. The Associated Press reported that the April blizzard "swept from Ohio through New England, and brought travel to a virtual standstill in cities such as Boston and New York." A snowstorm of such ferocity was unprecedented at that time of year.

Money supply figures were, and still are, released every Thursday afternoon for the calculations based on the previous week. The 4/6/82 storm had been so unexpectedly severe in the Northeast, that the U.S. Postal Service experienced massive delays in mail delivery, and transportation disruptions impacted commerce. So, how did this affect interest rates? Billions of dollars in Social Security checks didn't move through the postal system as normally anticipated. Millions of recipients got their checks late, and many weren't able to get to the bank. However, this may seem odd today because direct deposit and electronic banking now insulate the movement of money from the elements. When that M1 number was released it was several billion dollars short of expectations, signaling an immense lack of available cash; this in turn, implied the Fed would have to add reserves, and ease credit. The following week, of course, after all those checks had been received and deposited, then the numbers were back in line with predictions again. Economic analysts must have been aware of the blizzard as the star news story the previous week, but none of them had "connected the dots" when making their M1 predictions. The moral of this tale is that weather not only impacts the economy, but it can be "last week's weather" that takes investors and traders by surprise.

Storms come in all shapes and sizes. Weather products listed on the CME are structured to offer hedges against many of the obvious and mysterious events of Mother Nature. The most powerful of these, both literally and financially, are hurricanes. The financial waves caused by "named storms" run throughout commodity supply chains, flow along the yield curves and splash across the pages of corporate earnings reports. A storm's aftermath that made or broke a previous quarter's results is a lesson on how to prepare for it "next time."

Hurricane Ida, the November 2009 flash in the hurricane pan, raised some interest among analysts who follow the oil and gas services sector. Tropical storm Ida's hurricane potential was reminiscent of 2008's most damaging invader from the sky, Ike. Tetra Technologies (NYSE: TTI) operates an oil services and production business. In addition to selling drilling fluids, Woodlands (TX) based Tetra provides "abandonment services" for major oil companies shutting down operations at "played-out" wells. The damage caused by Hurricane Ike in September impacted TTI's fourth quarter earnings that year, and the stock under performed the S&P 500 (See Graph 1) as a result. It wasn't until the second quarter of 2009, that the company began seeing earnings from repair services related to Ike. (See Map 1)

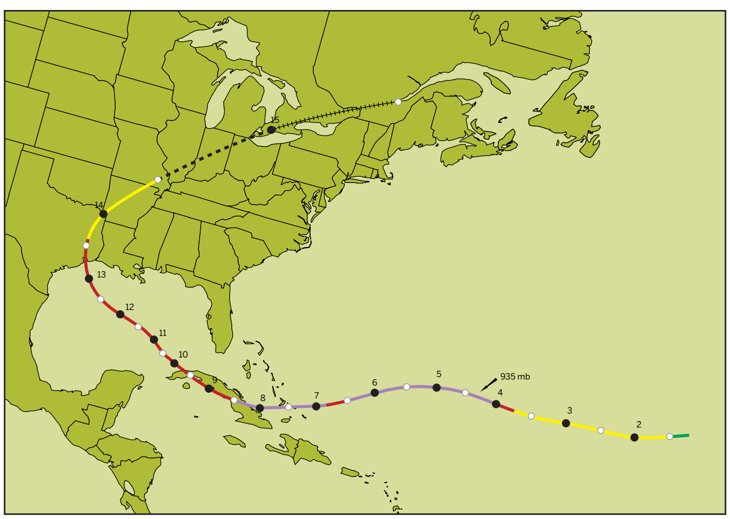
Graph 1:
Share Price Change (Percentage) from Start of Hurricane Season through End of 4th Quarter 2008



The action depicted on the satellite images, radar and weather maps gave rise to discussions of how Ida could be a replay of Ike. A November 9th story about TTI by Reuters reporter Antonita Madonna Devotta quoted analyst Thaddeus Vayda of Stifel Nicolaus & Co who said that it was not clear if the company will profit from Hurricane Ida, and that he didn't expect the company to gain from the hurricane and instead expects to see near-term headwinds because the level of activity will go down as the storm approaches. "If the hurricane doesn't do any damage, I do not think it has much of an impact at all... it could benefit them at the margins (in the longer-term) but I do not think I will factor in the influence of one weak storm," he said. When it became clear that Ida was not a major threat to Tetra, the stock price rallied. Ida reverted to a tropical storm and made landfall on the morning of November 10th, dumping heavy rains driven by gusty winds on the Alabama coast.

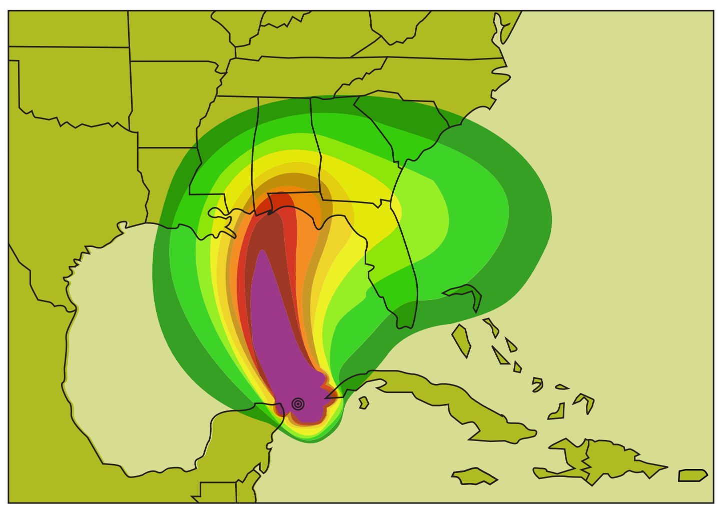
During the period when Ida was a tropical storm drenching Nicaragua as the forecasters said she could become a hurricane and head for the Gulf Coast, shares of TTI and similar companies fell in response. When Ida reached hurricane strength, the trajectory implied a path through the Gulf of Mexico and landfall near the Mississippi-Alabama state line. (See Map 2)

Map 1



Major Hurricane
Hurricane
Tropical Storm
Tropical Depression
Subtropical Storm
Subtropical Depression
Wave/Low
Extratropical
0000 UTC PosData
1200 UTC Position
935 mb Minimum Pressure

Map 2



Probability of tropical storm force surface winds (1-minute average >= 39 mph) from all tropical cyclones

◎ Indicates HURRICANE IDA center location at 12 PM CST Sun Nov 8 2009 (Forecast/Advisory #20)

5% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Before we examine how the hurricane market correlated to the TTI shares, here is an overview of the CME Hurricane Index:

THE CONTRACTS ARE DIVIDED INTO EIGHT REGIONS:

Gulf Coast – bounded by Brownsville, TX and the Alabama/Florida border

Florida – bounded by the Alabama/Florida border and Fernandina Beach, FL

Southern Atlantic Coast – bounded by Fernandina Beach, FL and the North Carolina/Virginia border

Northern Atlantic Coast – bounded by the North Carolina/Virginia border and Eastport, ME

Eastern U.S – including all of the regions listed above

CHI "Cat-In-A-Box,"– bounded by 95°30'0"W on the East, 27°30'0"N on the South, and the corresponding segment of the U.S. Coastline on the North

Gulf/Florida – including both the Gulf and Florida regions in one as described above

Newly Available Miami, FL Region – bounded by Card Sound Bridge, FL and Jupiter Inlet, FL

THE EXCHANGE LISTS SEVERAL DIFFERENT TYPES OF CONTRACTS:

- Standard Futures Contracts
- Named Storms
- Seasonal Accumulated Value
- Vanilla Options on Futures
- Seasonal Maximum Value
- Binary Options on Futures

The index itself is based on a formula that includes the wind speed (in miles per hour) and the radius of the storm (in miles). For our example using 2008's Hurricane Ike, we will use the Named Storm futures and the Binary option.

Table 1 shows how the CHI values compare with the more familiar Saphir Simpson category scale, including Ike's wind speed and size for reference.

One contract of the "Named Storm" Ike futures at CME Group was worth $530 on 9/2/08, and the stock price for TTI closed at $20.04 that day on the New York Stock Exchange. Ike made landfall on Saturday, 9/13/08. The Monday prices were $990 and $15.74, respectively. (See Graph 2) Theoretically, on a dollar neutral basis, a $250,000 investment in TTI on September 2nd, would have been for roughly 12,500 shares; and the comparable position in Ike futures would have been for about 500 contracts. This is hypothetical, and excluding the cost of brokerage commissions and the effect of the bid/ask spread. The 9/15/08 prices would have approximately yielded a $230,000 profit on the CHI position vs. a $53,750 loss on the drop in the equities portfolio. In this example the CHI position was more than needed to hedge, and the risk would have been the entire notional value of the futures, or $265,000 in losses had the storm dissipated, sending the index to zero.

Table 1:
CME Hurricane Index for Ike (2008)

Date	Time	Status	Wind	Radius	CHI Value
1-Sep	4:00	TS	50	0	0
2-Sep	10:00	TS	60	0	0
3-Sep	16:00	Cat 1	80	35	2.3
4-Sep	16:00	Cat 4	135	45	9.8
5-Sep	16:00	Cat 3	115	45	6.6
6-Sep	13:00	Cat 3	115	45	6.5
7-Sep	13:00	Cat 4	135	60	11.1
8-Sep	13:00	Cat 2	100	60	5.2
9-Sep	13:00	Cat 1	75	35	1.9
10-Sep	16:00	Cat 2	100	90	6.6
11-Sep	16:00	Cat 2	100	115	7.7
12-Sep	18:00	Cat 2	110	120	9.9
13-Sep	2:00	Cat 2	110	120	9.9
13-Sep	4:00	Cat 2	110	125	10.2

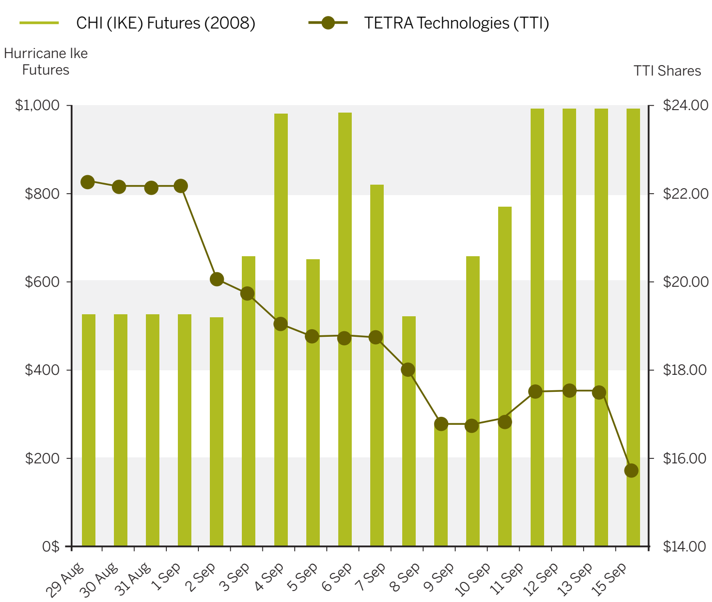
Source: Tradition Re

Regarding the binary options, the results would have been different, and the risk profile would, as well. According to CME Associate Director, Dave Bixby, binary options have a minimum tick increment of 0.01 point; each point represents $100. Binary option prices range from 0 to 100 points, indicating zero occurrence or definite occurrence, respectively. Maximum payout on a binary option is $10,000; note that this corresponds with the value of 100 points multiplied by $100. A price of 2345 for a binary option would mean the option costs $2,345 per contract; it could be inferred that the marketplace believes there is a 23.45 percent likelihood of occurrence.

Although no binary options traded for Ike at the time, the likely value was calculated by Willis Re's Dr. Smith. Having developed the CHI products, Smith has a broad perspective and significant insight on the value of these instruments. For a hypothetical case, we selected Ike binary calls with a strike of 5 CHI points, that might have been purchased on September 2, 2008, when Ike was still a tropical storm. Smith commented that "the 9/2/08 trade price would have been about 10 rate-on-line," reinsurance terminology for 10 percent of the maximum payout. This means that one contract of the Ike binary 5 call option could have traded for $1,000 on September 2nd, thus paying out $10,000 at settlement, for a $9,000 net return to the buyer.

In this case an investor looking to protect a 12,500 share TTI position from a $5 drop in the stock might have considered a binary costing $1,000 as a hurricane hedge. Such a move would lower the equity value by $62,500. Given the potential for netting $9,000 per option in the case of landfall, only seven binary contracts would be required to hedge 12,500 TTI shares. Again this is hypothetical and only used as an example, and not intended to be a recommendation. In the final installment of this three part look at hurricanes and equities, we will address the importance of hurricane forecasts in the media and the role that the insurance industry plays in the "hurricane business." Tying it all together, the use of CHI options can be a significant element.

Graph 2:
Share Price Change (Percentage) from Start of Hurricane Season through End of 4th Quarter 2008



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