

Managing weather risk to reduce earnings volatility

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Wall Street generally views weather risk as unavoidable as many analysts and investors are unaware of how to eliminate this uncontrollable variable.

Corporations are expected to provide earnings guidance based on 'normalised' weather. Such guidance rightfully assumes there are limits to predictability, so the Street estimates quarterly targets based on normal weather.

However, airlines, for example, would be heavily penalized for producing guidance based on 'normalised' fuel prices. All other commodity-based price fluctuations must be worked into corporate guidance by way of a systematic corporate risk management program. Yet diversified power and gas companies currently do not feel the need to hedge their weather risk as they do for other commodities. Nor do retail companies feel the need to hedge their weather risk even considering the known impact weather has on same-store sales volume. Investors and analysts in non-energy industries, in particular, are unaware of financial weather futures and, as a result, do not penalise companies for risk they wrongly believe to be out of management's control.

But avoidable financial upsets due to weather-related risks might put pressure on management to employ weather risk management strategies. If Wall Street continues to put emphasis on 'meeting the numbers', any missed targets due to deviations from normalised-weather guidance could change investors' perception of weather risk.

Fund managers and investors must outperform 'normal'. To increase portfolio performance, they must take the initiative in incorporating weather risk management strategies using new instruments such as the Chicago Mercantile Exchange (CME) weather futures and options.

As for most other commodities that impact the value-chain of corporations across many sectors, investors and analysts will learn that the CME has commoditised weather risk and it can now be systematically hedged. This presents a unique opportunity to 'outperform' other investors and funds given the lack of Wall Street's mandate to move beyond 'normalised weather' guidance as with other commodity prices. Taking a cue from zero-coupon bonds, we

have the opportunity to financially engineer zero-weather stocks. That would help decrease earnings volatility and could lead to increased profitability if employed correctly.

Creating the zero-weather stock portfolio

CME contracts are temperature-based and rely on the notion of Degree Days. A Degree Day is the measure of how much a day's average temperature deviates from 65° Fahrenheit (US) or 18° Celsius (Europe/Japan). The average daily tempera-

ture is the average of the day's maximum and minimum temperature on a midnight-to-midnight basis. The utility industry uses 65°F as a baseline because years ago that was the temperature at which furnaces would be switched on. Now it is used as a benchmark on the assumption that, for each degree below 65°, consumers will use more energy to heat their homes and for each degree above 65°, people will consume more energy to run their air conditioners. CME futures thus provide volumetric hedges for energy commodities whose volumes fluctuate because of the temperature-based demand for space heating and space cooling.

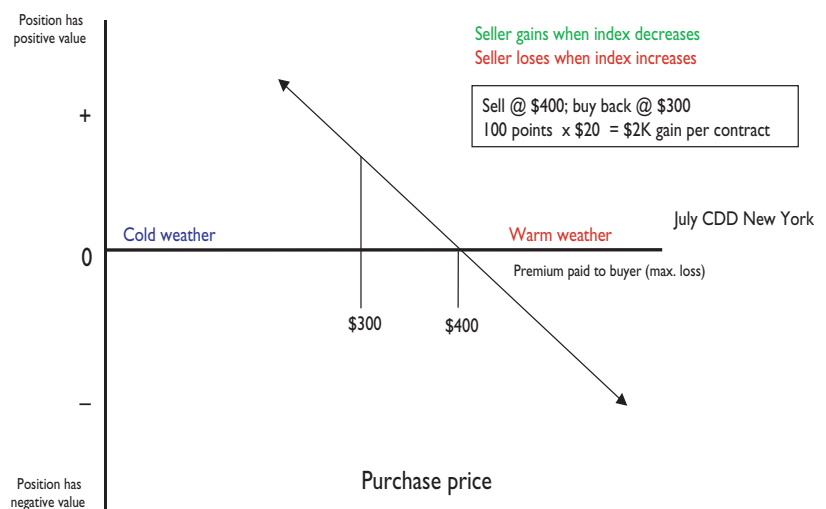
These futures contracts can also act as price hedges for other industry sectors whose earnings fluctuate due to weather, such as same-store retail sales, leisure park attendance, or where weather is a primary driver of an input commodity price impacting corporations on the expense side.

The CME index is an accumulation of Degree Days in a calendar month, or season, with \$20/£20/¥250,000 attached to each Degree Day for final cash settlement. For the US, CME contracts are available for the cooling months of April–October and for the heating months of October–April. Seasonal strips are also available which measure the accumulated Degree Days for an entire season.

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I. How CME CDD contracts can help a utility hedge against a cooler than expected summer and lower air conditioning demand



European and Asian contracts are also traded on the CME using Cumulative Average Temperature (CAT) and Average Temperature (AT). In Asia Pacific contracts, AT is the average of the daily averages while CAT is the cumulative daily averages for a period.

To create a zero-weather stock one must first understand the impact of weather on corporate earnings and its relationship to CME contract price movements. The minimal price movement is one 'tick' or \$20/£20/¥250,000. The contracts settle to cash values of the index at the end of the contract period. The CME currently trades monthly and seasonal contracts for 15 US cities, six European cities, and two Asian cities.

To illustrate how these contracts can be used by investors, consider the case of a power company investor who is concerned about a cooler summer causing low demand for air conditioning and resulting in weaker than expected earnings and a lower stock price. CME contracts could be used to hedge this risk as follows. The investor would sell CME Cooling Degree-Day (CDD) futures or buy CME CDD put options. These CDD puts would gain in value in the event that a cool summer actually occurred. In this case, the power company would see earnings come in lower than normalised guidance, its stock price would trade lower in response, but the CDD puts would pay out to offset the difference.

The result of not employing these strategies has been reported in many corporate earnings reports. For example, CNBC stated that "the weather impact alone decreased Atmos' earnings by \$0.20 per share" while Sears Canada said "cooler weather this summer hit its bottom line in the second quarter" resulting in a \$0.06/share loss.

By basing its earnings guidance on normal weather, Atmos missed its targets when cooler weather led to lower than expected air conditioning demand. The largest institutional holder of this stock has about 2.2 million shares so, for them, the weather impact equates to a \$440,000 loss. In fact the stock declined by almost \$0.50 per share in the trading session immediately following the earnings announcement and can largely be attributed to this unexpected weather related loss.

2. Portfolio with weather futures hedge versus without weather futures hedge

	Unhedged annual returns (%)	Hedged annual returns (%)
2003	13.89	14.58
2002	-20.32	-16.66
2001	-4.63	-4.58
2000	10.00	11.00
1999	12.01	12.61
1998	9.37	9.83
1997	19.75	20.73
1996	17.45	18.32
Total	69.00	78.00

Figure 1 is a schematic representation of how an equity investor could offset this risk using CME weather futures. It demonstrates that unexpected earnings losses due to weather can, in fact, be hedged.

Equity fund managers can utilise weather futures to hedge portfolios heavily weighted in utilities and natural gas. Figure 2 illustrates this, by comparing hedged and unhedged performance. In this case, we utilised simulated trade data with a selection of 50% utilities and 50% natur-

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al gas related equities. The portfolio includes companies such as Cinergy, Atmos, PG&E and Peoples Gas, among others.

The hedged portfolio assumes CDD and HDD put options are triggered when historical weather deviations impact earnings per share (EPS) by more than 5 cents. Historical Degree-Day trade information is based solely on observed historical weather averages, as the CME weather contracts are new financial instruments. The initial

portfolio was \$500,000 with reinvested profits. It is important to note that real market situations could yield very different results, but this simulated example does demonstrate the potential of weather hedging given the right underlying portfolio and risk management strategy.

In this example, utilising CME weather futures allows for reduced losses due to unfavourable weather. Periods of negative annual returns are less dramatic when a weather risk management strategy is employed. This leads to reduced portfolio volatility and steadier performance.

CME weather futures thus provide an opportunity for fund managers, traders, and investors to step ahead of Wall Street in creating a portfolio that properly factors in weather risk, as is commonly done for other commodities. The current gap left by Wall Street's reliance on earnings guidance using 'normalized' weather provides an opportunity for investors to use CME weather futures as their financial 'stealth weapon' to ultimately out-perform.

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