Weather Risk Management: A Step in the Right Direction

by:
Valerie Cooper

As Mark Twain observed, "Everybody talks about the weather, but nobody does anything about it."

This saying may have been true in 1897, when the *Hartford Courant* quoted Twain in an editorial, but more than a century later, the Weather Risk Management Association is not only talking about the weather, but it also has managed to do something about it. In the United States alone, the Bureau of Economic Analysis has stated that approximately $2.2 trillion of the U.S. Gross Domestic Product displays sensitivity to the weather.[1] As a result, an entire industry has been created to stave off the financial effects of unfavorable weather conditions, which hinder fiscal productivity. Beginning in 1997, weather risk management created an avenue for industries to manage their risks associated with weather. Through the use of financial risk management tools, businesses in a variety of industries could stabilize annual revenues that otherwise would be affected by changes in weather such as temperature, wind speed, snowfall, rainfall and storm activity.

For years, companies have used financial risk management tools to hedge against price, interest rates or currency, but simply absorbed the financial burden that resulted from irregular weather patterns. Weather

Valerie Cooper is executive director of the Weather Risk Management Association, located at 1156 15th St. N.W., Suite 900, Washington, DC 20005.

[1] *The Atlanta Journal Constitution.* "Weather, business a stormy mixture." September 1, 2002: p. c6.

risk management tools were designed to help businesses hedge against the impact of unexpected weather on earnings.

Unlike conventional financial risk management tools, which are based on share prices, bonds, exchange rates or currencies, weather risk financial products are based on weather data, which has an influence on the trading volume of some goods.[2] Using these tools as part of a risk management portfolio secures accuracy of budget forecasting; helps to control pricing and volume risk; and reduces income uncertainty by providing financial compensation when unsuitable weather conditions prevent earning revenue. Thus, weather becomes an asset rather than a liability.

Although energy companies, whose profits are intimately tied to the weather, initially used these financial tools to prevent profit loss as a result of warm winters and cool summers, a variety of industries, agricultural in particular, have found the use of weather risk products beneficial to their bottom line.

Among the largest uncertainties in agriculture is the weather, resulting in unique risks, principally in production and yield risk. The 1997 *World Crop Areas and Climate Profiles* report indicated: "Climate and weather are significant factors affecting agriculture production around the world. Both seasonal and regional variability in weather directly influence crop yield potential."

This risk arises because inclement weather patterns such as excessive or inadequate precipitation and extreme temperatures can affect quality and quantity of crop yield. As a result, the connection between crop production volumes and the weather is inevitable.

For example, a barley grower who depends on a mild climate for adequate production will be concerned if, nearing crop harvest, excessive rain and humidity cause damage to the color and test weight.[3] To counteract the financial

[2] Denney, Valerie. "Weather Derivatives: A Catalyst." *Global Reinsurance*. February 2002: pp. 7-8.

loss due to the climate conditions, the grower can hedge the risk by purchasing a weather risk product. The following is an extraction from a Cargill press release dated Aug. 23, 2001, demonstrating how a weather derivative contract can be structured: "The barley hedge is tied to the occurrence of rain events, defined as three consecutive days with total precipitation equal to or greater than .35 inches. Under the terms of this year's hedge agreement, nine events during the period will trigger a $.65 per bushel payment to producers (growers) using the hedge. Minimum hedging volume is typically 5,000 bushels, and the hedge can be purchased for $.12 a bushel, yielding a net $.53 per bushel gain in payout situations."

Depending on the crop, producers may need a variety of protection. Weather contracts can be structured to financially protect heat-loving crops such as cotton, which cannot survive frosts, prolonged cloudiness or excessive moisture in the early stages of development; or water-dependent crops such as spring wheat and corn, which require a sufficient amount of rain for reliable yields. Excessive precipitation or drought can affect the development of crops and consequently the profits resulting from the crop after the harvest. Weather risk management products used to cover weather exposure can significantly reduce yield-related financial instability; earnings are stabilized and minimum levels of income are guaranteed.

[3] Skees, Jerry. "The Potential Role of Weather Markets for U.S. Agriculture." Climate Risk Solutions Inc. *The Climate Report,* Volume 2, No. 4, Fall 2001: p. 2.

In addition to crop yield risk, livestock risk is unique to agriculture as well. According to a 1997 Agricultural Resource Management Study , commodities produced under production contracts in the livestock category were valued at $16,588 million.[4] These contracts guarantee timeliness and quality of delivery. A producer is expected to manage yield risk and is paid according to a formula established in the contract, typically tied to the performance of the animals.[5] Despite weather events such as drought, snowfall, excessive or low temperatures, or immense precipitation that may unexpectedly obstruct the production process and compromise the quantity, quality and timeliness of delivery, the producer is obligated to comply with the stipulations of the contract, thereby reducing revenue received while costs of production remain. The following is an excerpt taken from "Hedging Precipitation Risk," a chapter of *Risk Books,* authored by Entergy Koch Trading weather trading analysts. "Cattle ranchers can also be affected by extreme precipitation events. Droughts can leave pastures barren of grass,

[4] Harwood, Joy; Heifner, Richard; Coble, Keith; Perry, Janet; Somwaru, Agapi. "Managing Risk in Farming: Concepts, Research, and Analysis." Market and Trade Economics Division and Resource Economics Division, Economic Research Service, U.S. Department of Agriculture. *Agriculture Economic Report.* No. 774. March 1999: p. 21.

[5] Kunkel, Phillip L., Attorney; Larison, Scott T., Attorney, Hall & Byers, P.A. "Agricultural Production Contracts." University of Minnesota, Extension Service, 1998.

Purchasing risk management tools that offer weather protection and reduce the financial effects of adverse climate conditions is an important safeguard.

resulting in increased animal feeding costs. Winter rain or snowfall, which create muddy feedlots that reduce animal mobility, can increase animal discomfort. An uncomfortable cow does not eat and, therefore, does not gain weight. Because cattle are sold by the pound, the lower the weight, the lower the rancher's revenue." Uncertainty of income, coupled with rising production costs, leave agricultural producers with fewer margins for error. Consequently, purchasing risk management tools that offer weather protection and reduce the financial effects of adverse climate conditions is an important safeguard.

Although the weather risk management industry is still in its early stages, its value has received significant recognition from treasurers, CFOs, analysts and shareholders. A January 2002 report from Salomon Smith Barney on Atmos Energy Corp., a U.S.-based natural gas distributor, prominently cited the company's use of weather risk management tools as an important factor in protecting its earnings and cash flow.[6]

Likewise, analysts at Goldman Sachs and CIBC World Markets have singled out a company's decision to hedge weather as a choice that not only will make it a more valuable investment, but also improve its credit rating. This precaution is of particular importance to agricultural lenders as well, limiting revenue risk associated with institutional loans. It was reported that 21 percent of all commercial and intermediate-sized farms were forecasted to have debt repayment problems in 2002, which was up from 18 percent in 2001.[7] Using weather risk management tools contributes to long-term economic stability by decreasing the producers' financial and cash flow risk, making the obligations of debt repayment easier.

The weather risk management industry has become increasingly popular in recent years as a result of companies realizing that their revenue and profits no longer are at the mercy of the weather. As they have hedged against interest rates and currency fluctuations, they

[6] Salomon Smith Barney Inc., 2002. "Warm Temperatures Impact Earnings, But Weather Insurance Should Help." January 14, 2002.

[7] Stam, Jerome; Milkove, Daniel; Koenig, Steven; Collender, Robert; Covey, Ted; Ryan, James; Barnard, Charles. "Agricultural Income and Finance Outlook." Economic Research Service, U.S. Department of Agriculture, AIS-78. February 26, 2002: p. 2.

are now able to protect themselves from the risks associated with the fluctuations in weather. We have gone from a little known industry to a global industry of brokers, traders, consultants, insurers and government agencies that have taken a keen interest in participating in the most innovative segment of risk management today.

The Weather Risk Management Association (WRMA), formed in 1999, is dedicated to serving and promoting this industry. Its internationally based membership, which covers Europe, North America and Asia-Pacific, continues to develop as the trade association educates consumers whose businesses are affected by the weather.

The principal goal is to demonstrate that financial weather products are marketable and economically productive assets that will enhance the financial portfolio of any business. WRMA is devoted to developing industry standards of methodology and contracts, addressing critical issues that affect the industry, and facilitating the growth of a strong and vibrant weather trading market.

For more information on the weather risk management industry, visit www.wrma.org or call 202-389-3800.