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## Daily News

### Edhec/Till—Risk: Lessons from Amaranth

By Martin de Sa'Pinto, Senior Financial Correspondent

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CHICAGO (HedgeWorld.com)—While investors are still trying to come to terms with the collapse of Amaranth, the fact that such huge losses in natural gas spread trades could have occurred in such a brief space of time continues to require a thorough explanation. But there can be little doubt that the debacle involves a massive failure in risk-management procedures. The fund's risk management team appears to have not recognized the dangers of highly concentrated, leveraged positions in a niche and illiquid market, and in particular the difficulty of unwinding these positions in a crisis situation.

In a paper released today and titled "Edhec Comments on the Amaranth Case: Early Lessons from the Debacle," Hilary Till, co-founder of Chicago-based Premia Capital Management, a proprietary trading firm that focuses on natural resources markets, and an associate with the Edhec Risk and Asset Management Research Centre in Nice, France, examines what might have gone wrong.

Using publicly reported information on the fund's natural gas positions and recent gains and losses to estimate allocations to the fund's energy strategies, the research puts Amaranth's daily volatility due to energy trading at around 2% at the end of August. The Edhec report also says that the extraordinary losses of the week starting Sept. 11, and particularly the losses of Sept. 15, which caused the fund to face a liquidity crunch, was likely due to a nine-standard deviation event, that is to say a seemingly very unlikely occurrence.

Probably one of the most important assertions is that risk metrics using recent historical data would have vastly underestimated the magnitude of moves during an extreme liquidation pressure event. According to published reports, investors had known since May that Amaranth's energy portfolios typically had up or down months of around 11%, which translates into a monthly volatility of about 12%. This could have been deduced from a monthly sector-level analysis of the fund's profits and losses. Ms. Till concludes that it would therefore have been unsurprising for energy trades to lose up to 24%—a two-standard deviation event, or about a one-in-twenty chance—in a single month.

"It is easy to say in hindsight that the magnitude of Amaranth's energy position-taking was inappropriate relative to its capital base," Ms. Till told HedgeWorld. Even so, she said, in a more liquid market the consequences of unwinding positions over such a short period would not have been so severe.

Given the volatility of the energy-trading portfolio, investors might have grasped the high level of risk involved in Amaranth's energy strategy. Even so, without position-level transparency, they may not have realized how large the fund's over-the-counter natural gas positions were with respect to the open interest in the exchange-traded futures market. This would have given them an idea of how illiquid the fund's positions truly were, and how difficult they might be to unwind in a crunch.

A strongly adverse market movement, which in turn may have been triggered by the fund's initial attempts to reduce its exposure to the natural gas market, appears to have forced Amaranth to liquidate yet more of its positions. And in the absence of natural financial counterparties to take the other side of Amaranth's massive positions, the value of these positions rapidly fell further, triggering even more liquidations.

Such scenarios have been documented (and formally modeled) in the past for highly-leveraged funds; once a fund crosses a threshold of losses, a "critical liquidation cycle" begins, which in turn has been modeled as being a short barrier option. This has been done specifically in the Fall 2004 *Journal of Portfolio Management* article, "Dynamic Leverage," by Clifford de Souza and Mikhail Smirnov; and also was described in the April 2003 *Risk Magazine* article "A Liquidity Haircut for Hedge Funds," by Hari Krishnan and Izzy Nelken.

"Multiple standard deviation movements tend to cause liquidation pressure" for highly-leveraged institutions observed Ms. Till. If positions are highly leveraged and the market is, or turns, illiquid, the combination is a recipe for disaster.

But what was the fund's relationship to the real-world natural gas market, the one that underlay Amaranth's derivatives positions? "Amaranth was indeed likely to have been providing an economic service for physical natural gas participants," says the Edhec research paper authored by Ms. Till. "(T)his hedge fund [likely] provided liquidity for physical-market participants who could then lock in the value of forward production or the future value of storage [of natural gas]."

According to published reports, Amaranth may have been buying the March-April natural gas spread and shorting the Summer-Winter Natural Gas Spread throughout the natural gas curve, including the 2007, 2008, 2009, and 2010 deliveries. Each spread is during one of the inflection points in the seasonal use of natural gas and relies on the winter sector of the natural gas curve continually outperforming the other seasonal sectors of the curve.

The use of such a strategy by financial players such as hedge funds is risky if these participants cannot resolve or hedge their positions in the physical natural gas markets.

It appears that Amaranth's strategy relied on winter natural gas prices trading at a continual premium to the prices of other delivery-months on the natural gas curve. If this premium (or spread to other months) collapsed, then such a strategy would obviously perform very poorly. With positions on the scale of Amaranth's, the fund would have needed eventually to lay off the risk through physical market counterparties, if this unwinding were to have occurred in an orderly fashion. An evaluation of historical gas spread relationships would have revealed that such a collapse was not unprecedented. "Past scenario analyses would have shown that a collapse in the spreads is not unusual—although for such a collapse to occur in such a short time period in the deferred part of the natural gas curve is unusual," observed Ms. Till.

Ms. Till concluded that it is essential for commodity traders to understand how their positions fit into the wider scheme of behaviors in the physical commodity markets: Before initiating any large-scale trades in the commodity markets, a trader (or investor) needs to understand what catalyst will allow the trader out of the position.

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