Computer hedge funds hit the big time in 2008, but returns are shrinking. The hunt is on for better data

The algorithmic arms race

BY TOMMY WILKES AND LAURENCE FLETCHER
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It’s the day after Cambridge physicist Stephen Hawking’s 70th birthday party and David Harding, the head of one of the most successful hedge funds in the world, is bubbling with talk of black holes.

Given the financial crisis of the last few years, some might see that as an unwise topic of conversation for a hedge fund manager. But for Harding, a physicist, the geekier the better.

The 50-year-old runs Winton Capital, one of a secretive but influential band of computer-driven hedge
funds that bet tens of billions of dollars on the world's financial markets using algorithms - mathematical instructions to computers - which consume everything from bond price moves to rainfall statistics.

For Harding, whose business attracts mainstream pension investors from the world over, all of human knowledge is relevant. Rivals are circling, and data is becoming an increasingly strategic weapon.

Winton's collection of funds is now worth more than $29 billion. It has returned 14.8 percent a year in its main fund over the past decade - one of the best records over that period in the UK - and Harding is now likely to be Britain's highest-paid person, according to this year's Sunday Times Rich List. It says his wealth almost doubled last year to 800 million pounds ($1.27 billion).

Funds like his are known in the industry as trend-followers, managed futures funds or Commodity Trading Advisors (CTAs). Now run almost entirely by scientists, their 'black box' trading has entered popular culture: Robert Harris's latest thriller, "The Fear Index", features a fictional physics expert like Harding and rogue computer code.

But as algorithmic hedge funds have become better known and sucked in investors' money, returns have started to falter. Managed futures funds on average have lost money in two of the past three years, gaining just 4 percent in aggregate while the S&P 500 rose 49 percent. An investment in Winton's main fund would be down 0.75 percent in the first four months of this year.

The funds are struggling to cope with skittish markets. But they're also being squeezed by a more mundane fact: their basic techniques aren't so hard to copy, and can be worked out with a few internet searches. That's started a fight for market share between big names such as Winton, Geneva-based BlueTrend and AHL, a giant fund co-founded by Harding before he set up on his own. To win, a fund needs two things: better data and smarter ways to use it.

"It's a bit like a war ... you have to keep how to value secret sauce IDEA HUNTER: A trader at AHL. The fund says it has learned to watch its rivals. REUTERS/Olivia Harris
on upgrading your armaments,” said Philip Treleaven, a professor at University College London and head of its Financial Computing Centre, which works with some of the leading banks and fund managers. “You’re looking for ever-newer algorithms and so you’re using broader sets of data and non-traditional data.”

**TURTLE RETURNS**

To see how trend-followers aren’t all about rocket science, take one of the forefathers of today’s fund managers: Chicago-based trader Richard Dennis. In the 1980s, he made a bet with a rival that successful traders could be taught, that it wasn’t an innate talent.

As part of the contest, Dennis taught a breed of traders he called ‘Turtles’ because he trained them to lock into specific market trends and ride them, just as turtles ride sea currents. What was important was to decide on a system and stick with it.

The approach lends itself to computerised dealing, because in it, trades are often triggered by the dynamics of the market itself. A classic example is the moving average. Track the five-day moving average of a stock and, some traders believe, you should buy where it crosses above the 30-day average or sell when it falls below.

Such ideas can be converted into an algorithm that tells a computer when and how to trade.

The turtles’ edge, like trend-followers today, was in exploiting the reality that mainstream economic theory doesn’t allow for: financial markets don’t behave efficiently, but follow vogues and panics.

“The overwhelming fact is that this thing that shouldn’t have worked has worked for 30 years,” said Harding over lunch at his local West London Italian restaurant. Computers don’t need to be persuaded to hold firm when the market turns against them.

Trend-followers differ from other computer-driven trading systems such as high-frequency traders (HFTs) in the algorithms they feed their computers. HFTs work at lightning speed to profit from thousands of market inefficiencies, tiny gaps between asset prices that can be closed in milliseconds. Funds like Winton Capital bet on the bigger picture, of prices rising or falling over longer periods of time, often weeks, months, or even years.

Old-fashioned City traders once mocked the geeks.

“In the City the culture has always been to spit in their drinks and throw sand in their face,” Harding said.

A series of good years changed that. In 2008, when many markets cratered after the collapse of Lehman Brothers, CTA funds around the globe returned 18 percent. The sector has since attracted tens of billions in new investment, almost doubling in size between 2008 and the end of 2011 to $188 billion, according to data group Hedge Fund Research.

Winton, now the biggest player in the industry, sucked in a large chunk of that - $1 in every $8 poured into hedge funds globally last year – overtaking its chief rival AHL for the first time. Some of the keenest investors have been pension funds, seeking diversification and assets that move in different ways from stocks and bonds.

Investment consultants say pension funds that invest in hedge funds may typically place up to 4 percent of their assets in trend-followers.

**Losing their edge**

Trend-follower hedge funds are finding it harder to make returns. Here three of the largest are compared with the sector average.
**BLOW-UP**

But growth has brought new challenges. Today there are more than 500 rival CTAs, often using the same methods to play the same markets. Even high-frequency traders are trading where trend-followers previously made profits, and moving much faster.

One problem is that most firms use similar data. Good, computer-ready historical price information only goes back to the 1970s or ‘80s and some CTAs focus on this because they believe the rise of computer trading makes price movements in older markets irrelevant today.

The risk is obvious. Funds might all follow the same trend, and “something happens which forces a reversal in that trend,” said Alex Allen, Senior Portfolio Manager at London-based Sciens Capital, which invests in hedge funds including CTAs.

“Think of it as a slow-motion flash crash. “It’s hugely risky,” says UCL’s Treleaven. Imagine, “everything is going fine and they are all trading fine and then you go through some particular event and all the funds lock onto it, and they all go down together.”

The CTAs themselves admit the possibility of something going wrong: Winton hopes to insulate itself by limiting the size of its bets. “We don’t use large amounts of leverage, in the expectation that if there is some mad rush for the exit doors then we won’t end up being impaled on the railings as we squeeze through,” said its chief investment officer Matthew Beddall.

The scientists at Winton say one thing that sets them apart is the sheer amount of data they base their algorithms on. More historical information, they say, helps put price trends into context.

The company’s London offices display charts tracking the prices of commodities going back hundreds of years, old maps and bank notes and even a dividend cheque from the 18th-century South Sea Company.

Winton sends researchers to libraries and archives across the world to find numbers held in books and on microfilms. It has found barley and sesame prices from ancient Babylon, and English wheat prices going back to 1209.

It now employs more than 90 researchers, including extragalactic astrophysicists, computer scientists and climatologists. The company hired a meteorologist who had researched the “El Nino” phenomenon. The physics graduate - Winton wants to keep his name secret for fear a rival might poach him - works in London correlating weather data to crops such as corn, wheat and soybeans. That data can be used to forecast how prices might fluctuate with the weather.

While traders in commodities have long looked at weather statistics and forecasts, the attempt to computerise the process creates the basis of an industry.

“It’s easy to make forecasts if you’re not going to do anything,” said the short-haired meteorologist, who is in his late 30s and wears jeans and T-shirt. When millions hinge on his forecasts, he said, the job is much more interesting.

**BIG TWITTER**

Other hedge funds are joining the hunt.

A computer system that can measure fear is at the centre of Harris’s thriller, and actually not far from reality. Derwent Capital Markets, a London-based hedge fund firm, uses a program that mines millions of comments made on Twitter to ascertain sentiment, examining the results to predict stock movements.

Correlating data from social media websites to markets is one of the hottest topics among this year’s quantitative finance stu-
dents, UCL’s Treleaven said. Several other hedge funds are also studying how they might incorporate such data.

The funds’ methods can be arcane. A large trend-follower reputedly hired a memory champion to look at, and memorise, the numbers displayed in old reference books that cannot be photocopied or removed from libraries, according to one CTA investor.

But the information is only as good as those who work it, which is where the scientific brains come in. Hedge funds compete with the likes of Google, Amazon, and the Large Hadron Collider in Geneva for the best talent.

“Sometimes I genuinely have pangs of guilt that we’ve created an alternate channel for these brilliant young physicists to come into when frankly they should be finding the Higgs-Boson,” says Martin Lueck, the ‘L’ in AHL, and founder of Aspect Capital, a $6.8 billion trend-follower based in London.

Winton spends 20-30 million pounds a year on research - not much compared with the billions spent by the world’s biggest pharma groups. AHL won’t give details but says it has over 90 researchers; its parent firm has put 13.75 million pounds into the Oxford-Man institute, a tie-up with Oxford University.

Winton and AHL, who together manage more than a quarter of the assets invested in the sector globally, are wary of talking about certain parts of their business. The $14 billion fund BlueTrend, launched in 2004 by a team led by Brazilian Leda Braga, and Transtrend, a Rotterdam-based firm managing $9.7 billion, declined to speak at all.

NEW ALGORITHMS

In the middle of a trading floor overlooking the Thames, a huge screen flashes with the deals – everything from interest rate futures to oil contracts – made by AHL’s black-box computer.

The firm has recently had a rough ride: its portfolio fell almost 17 percent in 2009 and lost 6.8 percent last year when the fund’s assets shrank 11 percent to $21 billion, dragging the share price of its parent, Man Group.

“We’ve learned our lessons,” says boss Tim Wong. The fund is now keenly aware of the need to pay attention to what its rivals may be doing, he says.

But AHL isn’t out to match Winton’s ancient data - its chief scientist Anthony Ledford argues that modern markets behave very differently than they did 50 or 100 years ago.

Instead, it is sharpening up its processes. AHL has cut back its short-term algorithms, and is developing codes to profit from different market patterns away from trend-following – for example, betting on the fact that markets tend to iron out short-term anomalies over time, or revert to the mean.

With volatility so high now, it is also developing new algorithms that try to predict, and trade on, the changing volatility of different assets.

Its approach gets support from some investors.

“The old CTAs are relying too much on the past,” said Monty Agarwal, an author and founding partner of Managed Futures Fund, which invests in both its own and external CTAs. “The new strategies that we see thriving are mean reversion, which is trend anticipation, and pattern recognition – artificial intelligence.”

The funds know they need something new to generate ‘alpha’, or outperform the market. AHL’s Ledford isn’t sure whether short-term codes will ever work again. “It’s either taken an extremely long time for the alpha to come back from those frequencies or it’s not coming back,” he said. “And I still don’t know the answer to that.”

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