

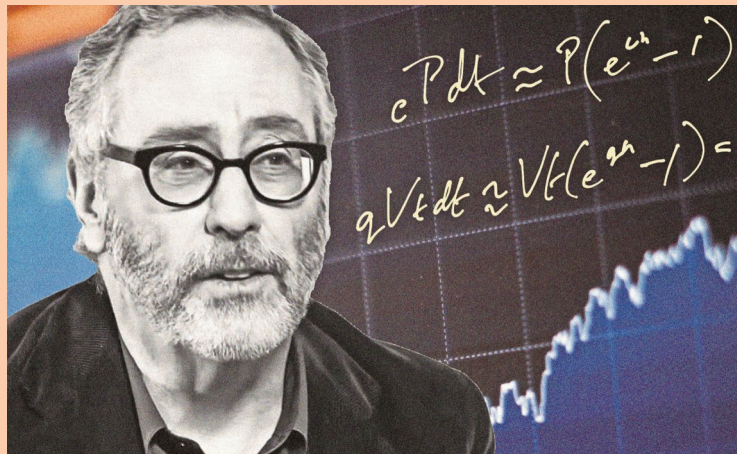
## THE BIG READ

**D. E. Shaw and Company**

# DE Shaw: inside Manhattan's 'Silicon Valley' hedge fund

Secretive group mixes quant investing with common sense, but is fighting to keep its \$50bn edge

ROBIN WIGGLESWORTH – NEW YORK



Breaking the code: David Shaw, the hedge fund's founder, has passed day-to-day control of the company to an executive committee FT montage/Getty Images

In 1988, Revolution Books, a tatty Communist bookstore near New York's Union Square, got some strange new upstairs neighbours: a bunch of geeky programmers trying to crack the code to financial markets.

In the early days, the embryonic hedge fund founded by David Shaw, a former computer science professor at Columbia University, was a ramshackle start-up. Exposed pipes and extension cords meant that tripping on a cable could take out its entire trading system. Yet today DE Shaw is one of the hedge fund industry's biggest players, managing over \$50bn of assets.

It has enjoyed some mainstream fame as the place where a young Jeff Bezos first worked on what would ultimately become Amazon. But most importantly for a wider investment industry desperately trying to reinvent itself for the 21st century, DE Shaw has evolved dramatically from the algorithmic,

computer-driven "quantitative" trading it helped pioneer in the 1980s.

It is now a leader in combining quantitative investing with traditional "fundamental" strategies driven by humans, such as stockpicking. This symbiosis has been dubbed "quantamental" by asset managers now attempting to do the same. Many in the industry believe this is the future, and are rushing to hire computer scientists to help realise the benefits of big data and artificial intelligence in their strategies.

Eric Schmidt, the former Google chairman who owns a 20 per cent stake in DE Shaw, predicts that this approach will profoundly reshape the investment management industry. "People have gone insane about this, but in a good way," Mr Schmidt says. "We are at the beginning of a new era in artificial intelligence. These technologies should benefit investing as well."

There are plenty of pitfalls though, with experts warning that poor implementation can lead to disastrous results. Wall Street has seen several cycles of quant hype before, and many remain sceptical that traditional firms can retool their culture sufficiently to unlock the potential advantages of a more hybrid approach.

The combination of DE Shaw's performance and the secrecy around exactly what it does both vexes and fascinates rivals and counterparties. "They're like a calibrated machine that can respond to nearly every market," says the head of an investment bank's hedge fund trading desk. In a series of interviews with senior DE Shaw executives, the Financial Times has had a rare glimpse of how the "machine" operates.

### Little known outside

investing's arcane corners, DE Shaw is the fourth-highest grossing hedge fund group of all time, having made over \$29bn

for its investors since those early days near Union Square, according to LCH Investments.

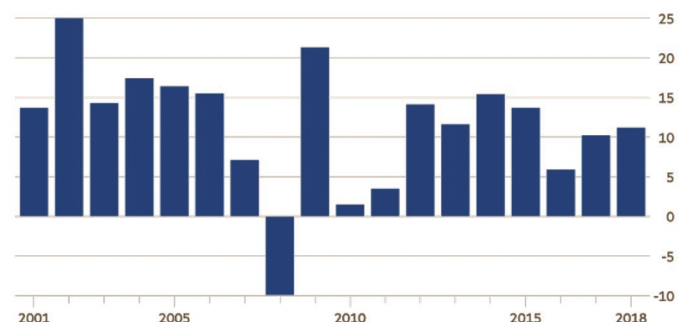
Last year its flagship \$14bn Composite Fund – which has been closed to new investors since 2013 – returned over 11 per cent to investors net of fees, despite the turmoil in financial markets. That was its seventh double-digit gain of the past decade, over which period it has not suffered a losing year. Its \$7.6bn "macro" fund, Oculus, returned 5.9 per cent in 2018, and the \$7bn stocks-focused Valence made 8 per cent.

Even among peers on Wall Street, DE Shaw is still a largely unknown quantity. "They're really smart, but I've never quite understood them," says one quant hedge fund manager. "They are one of those places where you just don't know exactly what [it is] they do, except that it is some mix of quantitative and discretionary investing."

This hybrid approach is not new. DE Shaw ventured out of its quantitative roots

### DE Shaw Composite Fund recovers after turbulent crisis performance

Annual return (%)



\* Partial-year return; not annualised  
Source: Investor documents  
© FT

soon after its founding. But it now manages a wide array of strategies, ranging from completely machine-driven and dizzyingly complex, to human and artisanal, such as “distressed debt” investing and activism.

Roughly half of the \$50bn it manages are in quant strategies, and the rest in discretionary or more hybrid funds.

“The world tends to view quantitative and fully discretionary investing as distinct and separate, but the opportunity set [to make money] is not as cleanly divided,” says Max Stone, one of the five members of DE Shaw’s executive committee, along with Eddie Fishman, Eric Wepsic, Julius Gaudio and Anne Denning.

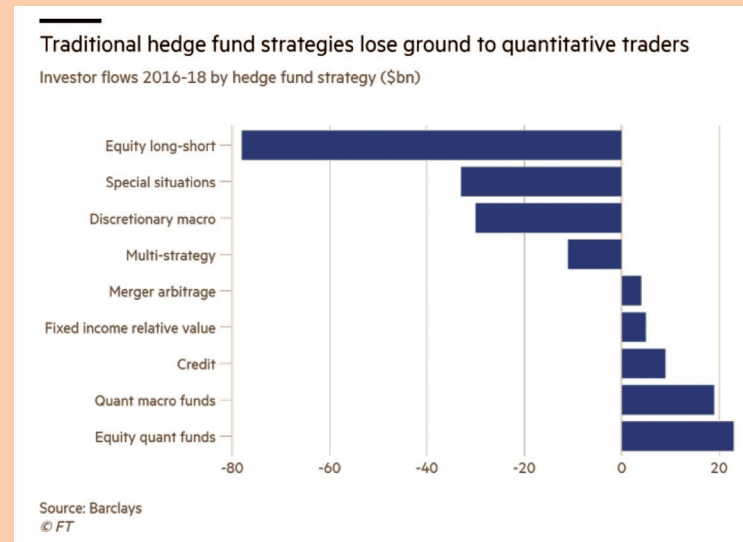
Some rivals question whether it has departed too far from its roots. For instance, Two Sigma — a major quant hedge fund started by former senior DE Shaw executives — has eschewed their former colleagues’ hybrid methods.



**Former Google executive Eric Schmidt has a 20 per cent stake in DE Shaw** © Bloomberg

DE Shaw executives stress that their one constant is to have a data-driven “qu岸ty” approach across the board, whether it is in high-speed arbitrage or investing in renewable energy. “Our core strength is thinking scientifically about things, so it doesn’t feel like we are wandering away from our roots,” says Alexis Halaby, head of investor relations at the company.

It currently employs about 1,300 people, which includes over 80 PhDs and 25 International Math Olympiad medal holders. All interviewees at DE Shaw face a series



of analytical questions to demonstrate their suitability to work there — something even former US Treasury secretary Larry Summers had to go through ahead of a stint at the fund in 2006.

That approach seeps through into the culture, say observers. Mahmood Noorani, a former hedge fund manager who now leads Quant Insight, an analytics company, describes the people at DE Shaw as “less alpha male and more gentle scientists”.

This has helped the company survive the type of leadership transition that has felled some rivals.

Most hedge funds see their fortunes fade once their founder steps down, but DE Shaw has thrived since Mr Shaw, 67, semi-retired in the early 2000s to pursue research into “computational biochemistry”.

Fittingly for a company started above a bookstore selling Marxist treatises, the day-to-day running of the hedge fund is now handled by the central committee of five, rather than a single, imperial impresario typical of the industry. “You’d be hard-pressed to find a management textbook that says a committee is a good way of running a company,” says Mr Stone. “But it works for us.”

This was among the factors that attracted Mr Schmidt when he scooped up the 20 per cent stake in DE Shaw held by the bankrupt estate of Lehman Brothers in 2015. “It feels like Silicon Valley in Manhattan,” he says. “People get consumed

by hierarchy, but the evidence shows that flat structures and diverse teams operating collectively have better outcomes.”

Sometimes things go awry, however. In an unusually public spat for a company that shuns publicity, DE Shaw last year fired Daniel Michalow, a senior fund manager, after an internal review found “gross violations of our standards and values”.

In an open letter Mr Michalow conceded that he might have deserved his dismissal for being “an abrasive boss” but insisted that his departure was not related to any sexual misconduct. He did, however, paint a very different picture of DE Shaw criticising the hedge fund for “lavish, alcohol-filled parties” and said visits to strip clubs and senior employee relationships with their juniors were common. DE Shaw declined to comment on the accusations, citing ongoing legal proceedings.

Mr Michalow is suing DE Shaw for defamation and other claims relating to



**DE Shaw founder David Shaw remains chairman of the hedge fund** © Bloomberg

the announcement of his termination.

The hedge fund’s executives are happier to discuss how it manages money, even if the details can be opaque. DE Shaw runs some quant strategies so complex or quick that they are in practice almost beyond human understanding — something that many quantitative analysts are reluctant to concede.

The goal is to find patterns on the fuzzy edge of observability in financial markets, so faint that they haven’t already been exploited by other quants. They then hoard as many of these signals as possible and systematically mine them until they run dry — and repeat the process. These can range from tiny, fleeting arbitrage opportunities between closely-linked stocks that only machines can detect, to using new alternative data sets such as satellite imagery and mobile phone data to get a better understanding of a company’s results.

**Yet, the hedge fund’s** executives say they also frequently use common sense to overrule their algorithms, another anathema in an industry where human tinkering can be considered a foible.

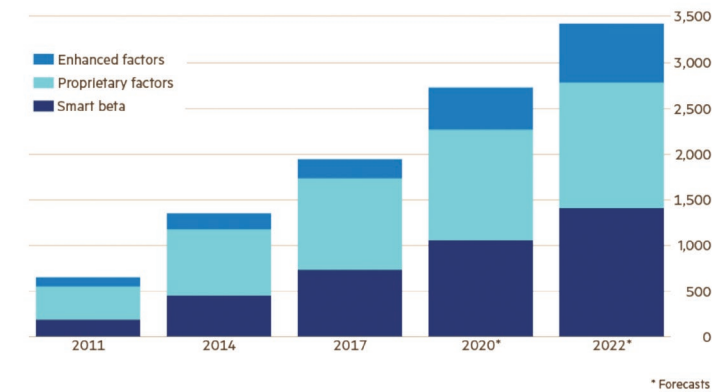
Some of these manual interventions are obvious. For example, when Russia annexed the Crimean part of Ukraine in 2014 and started fomenting unrest in its eastern province, DE Shaw quickly dialled back its exposure to the Moscow stock market. And when the Volkswagen emission cheating scandal erupted a year later — another of the unexpected shocks that machines are ill-equipped to deal with — it pared back bets on the carmaker.

Other strategies require a heavier human hand, such as taking advantage of periodically wide discrepancies between Tencent and Naspers, the South African holding company that owns nearly a third of the Chinese tech giant. Normally they trade in lockstep, but sometimes they diverge because of broader emerging market stress or South African politics — opening up a valuable



## A boom time for factor investing

Assets under management (\$bn) by industry factor



Source: BlackRock  
© FT

opportunity. The optimal time to pounce can be modelled, but is best paired with the discretion of a human fund manager.

Yet, DE Shaw still sees plenty of opportunities in the quantitative investing side, especially its “long-only”, non-hedge fund investing business, DE Shaw Investment Management. DESIM has quintupled in size since 2011 and now manages \$24bn. To grow this further, the company is expanding into something dubbed “risk premia”, systematically exploiting theoretically timeless drivers of returns, such as the tendency for smaller or cheaper stocks to outperform the overall market over time.

Historically these have been factors that hedge funds might explicitly or indirectly harness — and charge hefty fees for — but they have now been packaged up into simpler, cheaper vehicles by the likes of AQR and BlackRock.

DE Shaw is also ramping up its investment in the bleeding edge of computer science, setting up a machine learning research group led by Pedro Domingos, a professor of computer science and engineering and author of *The Master Algorithm*, and investing in a quantum computing start-up.

It is early days, but Cedo Crnkovic, a managing director at DE Shaw, says a fully-functioning quantum computer

could potentially prove revolutionary. “Computing power drives everything, and sets a limit to what we can do, so exponentially more computing power would be transformative,” he says.

**Nearly every traditional investment company** is scrambling to hire data scientists, programmers and technologists, and turn themselves into human-machine hybrids. DE Shaw’s apparent success in bridging those two worlds offers an alluring template for rivals.

However, many “pure” quants are sceptical that traditional asset managers have the cultural architecture needed to make a success, arguing that companies cannot just hire a bunch of computer scientists, tell them to work

with 50-year-old fund managers with MBAs and hope that magic will ensue. Others fret that by not fully grasping the limitations, they might even do damage to themselves, and or investors.

Mr Stone has a stuffed albino peacock sitting on a cabinet in his office, a reminder that sometimes markets — like nature — serve up the unexpected. He is wary of criticising the quantamental rush, but also cautions that it could end in tears.

“There are some good ideas at the intersection of systematic and discretionary investing,” he says.

Nonetheless, “if you don’t have experience of separating signal from noise,” he adds, “you can easily be led astray by extraneous data.”



DE Shaw analysts overruled the algorithms when it spotted the danger of exposure to Moscow stocks after Russia annexed Crimea © Reuters

## ‘Crowding’ fears Will quants be able to ride out the next crisis?

For many, the summer of 1998 was defined by the Monica Lewinsky scandal enveloping the White House, the Spice Girls losing a member and France’s stunning victory at the football World Cup. But for the finance industry, that summer will forever be remembered as the period when some of the finest minds on Wall Street came undone.

The collapse of Long-Term Capital Management, the hedge fund led by Salomon Brothers’ former star trader John Meriwether and advised by Nobel

laureates Myron Scholes and Robert Merton, hogged the headlines. But the market maelstrom also nearly killed DE Shaw, which had made many of the same trades as LTCM with similarly massive dollops of leverage. “The market environment was harrowing,” says Eddie Fishman, who now sits on the DE Shaw executive committee. “But the lessons served us well in subsequent crises.”

The 1998 crisis, and the “quant quake” in August 2007, are reminders that even the most sophisticated computer-powered strategies can implode. Given the popularity of quantitative investing and the competition to find and mine new trading signals, there are concerns that markets are primed for a rerun.

History indicates that the two main dangers are leverage and “crowding”. The toxicity of aggressive leverage — whether debt or through derivatives — is well-known, but too many investors crowding into the same security or trade can also cause severe damage, especially when trading conditions deteriorate quickly.

While most hedge funds use far less leverage than in 1998 or 2007, the sheer amount of money raised by quant funds since the crisis is leading to fears of crowding, lowering returns for everyone and ultimately raising the risk of an abrupt reversal, which would in turn lead to a crash as burnt investors dash for the exit.

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