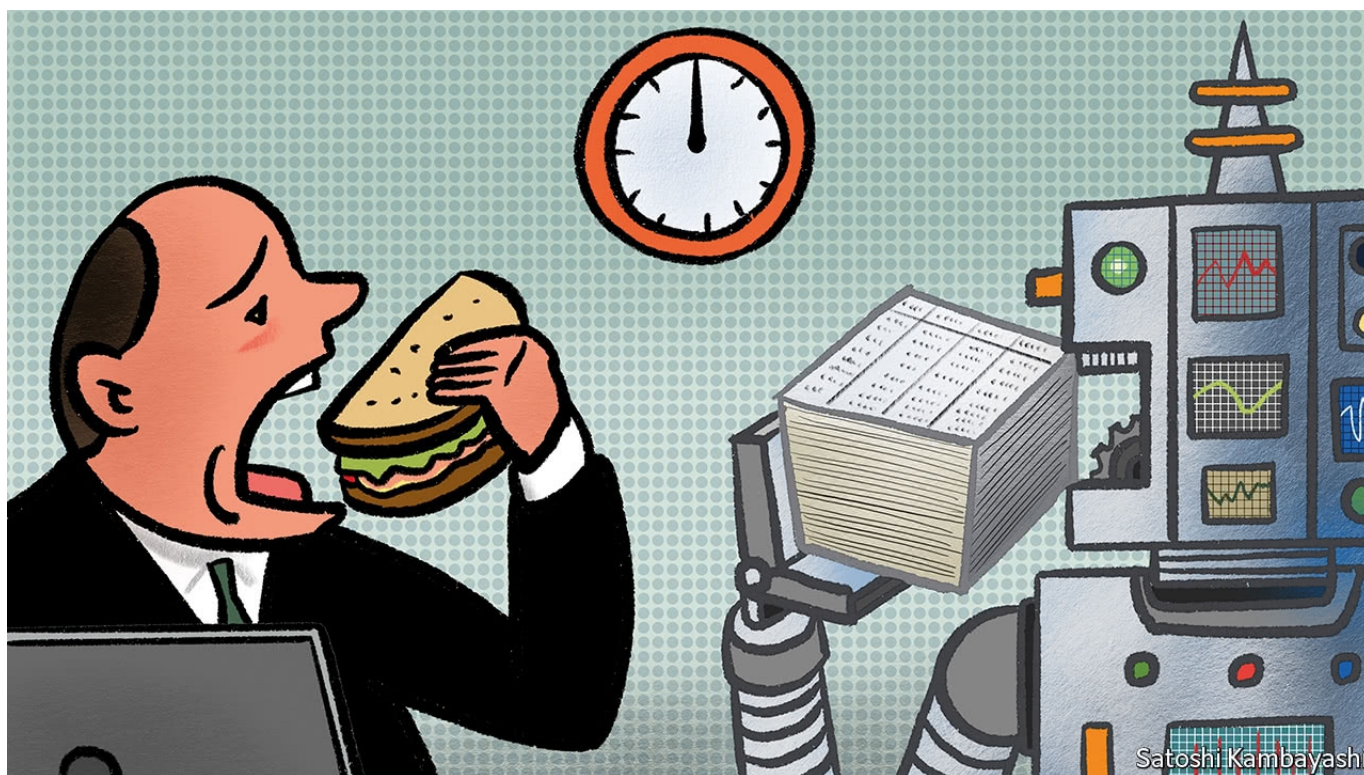


Unshackled algorithms

Machine-learning promises to shake up large swathes of finance

In fields from trading to credit assessment to fraud prevention, machine-learning is advancing



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Print edition | Finance and economics

May 25th 2017

MACHINE-LEARNING is beginning to shake up finance. A subset of artificial intelligence (AI) that excels at finding patterns and making predictions, it used to

be the preserve of technology firms. The financial industry has jumped on the bandwagon. To cite just a few examples, “heads of machine-learning” can be found at PwC, a consultancy and auditing firm, at JP Morgan Chase, a large bank, and at Man GLG, a hedge-fund manager. From 2019, anyone seeking to become a “chartered financial analyst”, a sought-after distinction in the industry, will need AI expertise to pass his exams.

Despite the scepticism of many, including, surprisingly, some “quant” hedge funds that specialise in algorithm-based trading, machine-learning is poised to have a big impact. Innovative fintech firms and a few nimble incumbents have started applying the technique to everything from fraud protection to finding new trading strategies—promising to up-end not just the humdrum drudgery of the back-office, but the more glamorous stuff up-front.

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Machine-learning is already much used for tasks such as compliance, risk management and fraud prevention. Intelligent Voice, a British firm, sells its machine-learning-driven speech-transcription tool to large banks to monitor traders' phone calls for signs of wrongdoing, such as insider trading. Other specialists, like Xcelerit or Kinetica, offer banks and investment firms near-real-time tracking of their risk exposures, allowing

them to monitor their capital requirements at all times.

Machine-learning excels in spotting unusual patterns of transactions, which can indicate fraud. Firms ranging from startups such as Feedzai (for payments) or Shift Technology (for insurance) to behemoths such as IBM are offering such services. Some are developing the skills in-house. Monzo, a British banking startup, built a

model quick enough to stop would-be fraudsters from completing a transaction, bringing the fraud rate on its pre-paid cards down from 0.85% in June 2016 to less than 0.1% by January 2017.

Natural-language processing, where AI-based systems are unleashed on text, is starting to have a big impact in document-heavy parts of finance. In June 2016 JPMorgan Chase deployed software that can sift through 12,000 commercial-loan contracts in seconds, compared with the 360,000 hours it used to take lawyers and loan officers to review the contracts.

Machine-learning is also good at automating financial decisions, whether assessing creditworthiness or eligibility for an insurance policy. Zest Finance has been in the business of automated credit-scoring since its founding in 2009. Earlier this year it rolled out a machine-learning underwriting tool to help lenders make credit decisions, even for people with little conventional credit-scoring information. It sifts through vast amounts of data, such as people's payment history or how they interact with a lender's website. Lemonade, a tech-savvy insurance startup, is using machine-learning both to sell insurance policies and to manage claims.

Perhaps the newest frontier for machine-learning is in trading, where it is used both to crunch market data and to select and trade portfolios of securities. The quantitative-investment strategies division at Goldman Sachs uses language processing driven by machine-learning to go through thousands of analysts' reports on companies. It compiles an aggregate "sentiment score" based on the balance of positive to negative words. This score is then used to help pick stocks. Goldman has also invested in Kensho, a startup that uses machine-learning to predict how events like natural disasters will affect market prices, based on data on similar events.

Quantifiable progress

Quant hedge funds, both new and old, are piling in. Castle Ridge Asset Management, a Toronto-based upstart, has achieved annual average returns of 32% since its founding in 2013. It uses a sophisticated machine-learning system, like those used to model evolutionary biology, to make investment decisions. It is so sensitive, claims the firm's chief executive, Adrian de Valois-Franklin, that it picked up 24 acquisitions before they were even announced (because of telltale signals suggesting a small amount of insider trading). Man AHL, meanwhile, a well-established \$18.8bn quant fund provider, has been conducting research into machine-learning for trading purposes since 2009, and using it as one of the techniques to manage client money since 2014.

So it seems odd that some prominent quant funds are machine-learning sceptics. Martin Lueck of Aspect Capital finds the technique overrated, saying his firm has found only limited useful applications for it. David Siegel, co-founder of Two Sigma, a quant behemoth, and David Harding of Winton Capital, have also argued that the techniques are overhyped.

In other fields, however, machine-learning has game-changing potential. There is no reason to expect finance to be different. According to Jonathan Masci of Quantenstein, a machine-learning fund manager, years of work on rules-based approaches in computer vision—telling a computer how to recognise a nose, say—were swiftly eclipsed in 2012 by machine-learning processes that allowed computers to “learn” what a nose looked like from perusing millions of nasal pin-ups. Similarly, says Mr Masci, a machine-learning algorithm ought to beat conventional trading strategies based on rules set by humans.

The real vulnerability may in any case lie outside trading. Many quant funds depend on human researchers to sift through data and build algorithms. These posts could be replaced by better-performing machines. For all their professed scepticism, Two Sigma and its peers are busy recruiting machine-learning specialists.