

# SWISSQUOTE

M A G A Z I N E

FINANCE AND TECHNOLOGY UNPACKED

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**HEALTHCARE**  
Interview with  
the CEO of Alcon

**ENVIRONMENT**  
**PFAS,**  
the forever  
pollutants

**SPECULATION**  
The overwhelming  
power of short sellers

**D O S S I E R**

## Market mood dissected by AI

How machines scan  
business news and  
social media

ISSN 2296-3278



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# THERE IS ETERNITY IN EVERY BLANCPAIN

The spirit to preserve.

70<sup>th</sup>  
*Fifty Fathoms*  
70<sup>th</sup> anniversary



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Co-Axial Master Chronometer

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Ω  
OMEGA



# AI, the thermometer of market sentiment

**T**he financial industry is in the throes of a silent revolution. Gone seem to be the days when investor decisions were based almost exclusively on traditional economic indicators. These days, artificial intelligence has the ability to process colossal flows of data in real time, opening up opportunities that we have never seen before. For one, AI brings unprecedented precision to market sentiment analysis. Machines can now use natural language processing to decode emotions, narratives and emerging trends from millions of news sources, from the business press to social media and expert blogs.

Institutions as serious as the US central banking system (Fed) recognise the value of these tools. As a consequence, we now have indicators such as the Twitter Financial Sentiment Index, which aims to predict shocks caused by monetary policy tightening, such as rate hikes (tweets tend to become more bitter just before these movements). Plenty of examples attest to this, and there is no doubt that AI can bring

about more informed investment decisions.

These advances aside, one question comes to mind: are we at risk of relying too heavily on these technologies? One of the potential dangers of the rapid democratisation of AI involves the levelling out of investment decisions. If the majority of individuals resort to similar AI tools to guide their choices, strategies would end up standardising. This would eventually amplify price movements and potentially create financial bubbles.

It is therefore important for these new technologies to be combined with personal analysis. AI does not replace human judgement, intuition and experience – at least not for a while longer. After all, if history has taught us anything, it is that markets are unpredictable and that no tool, no matter how sophisticated, can guarantee success.

We hope you enjoy this issue!



BY MARC BÜRKI,  
CEO OF SWISSQUOTE



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Epitomising the pure and sophisticated aesthetics of the Alpine Eagle collection, this 44 mm-diameter model is crafted from Chopard's exclusive, high-quality Lucent Steel™. The innovative features of its chronometer-certified Chopard 03.05-C chronograph movement, equipped with a flyback function, are protected by three patents. Proudly developed and handcrafted by our Artisans, this exceptional timepiece showcases the finest expertise and innovation cultivated within our Manufacture.

*Chopard*

THE ARTISAN OF EMOTIONS – SINCE 1860



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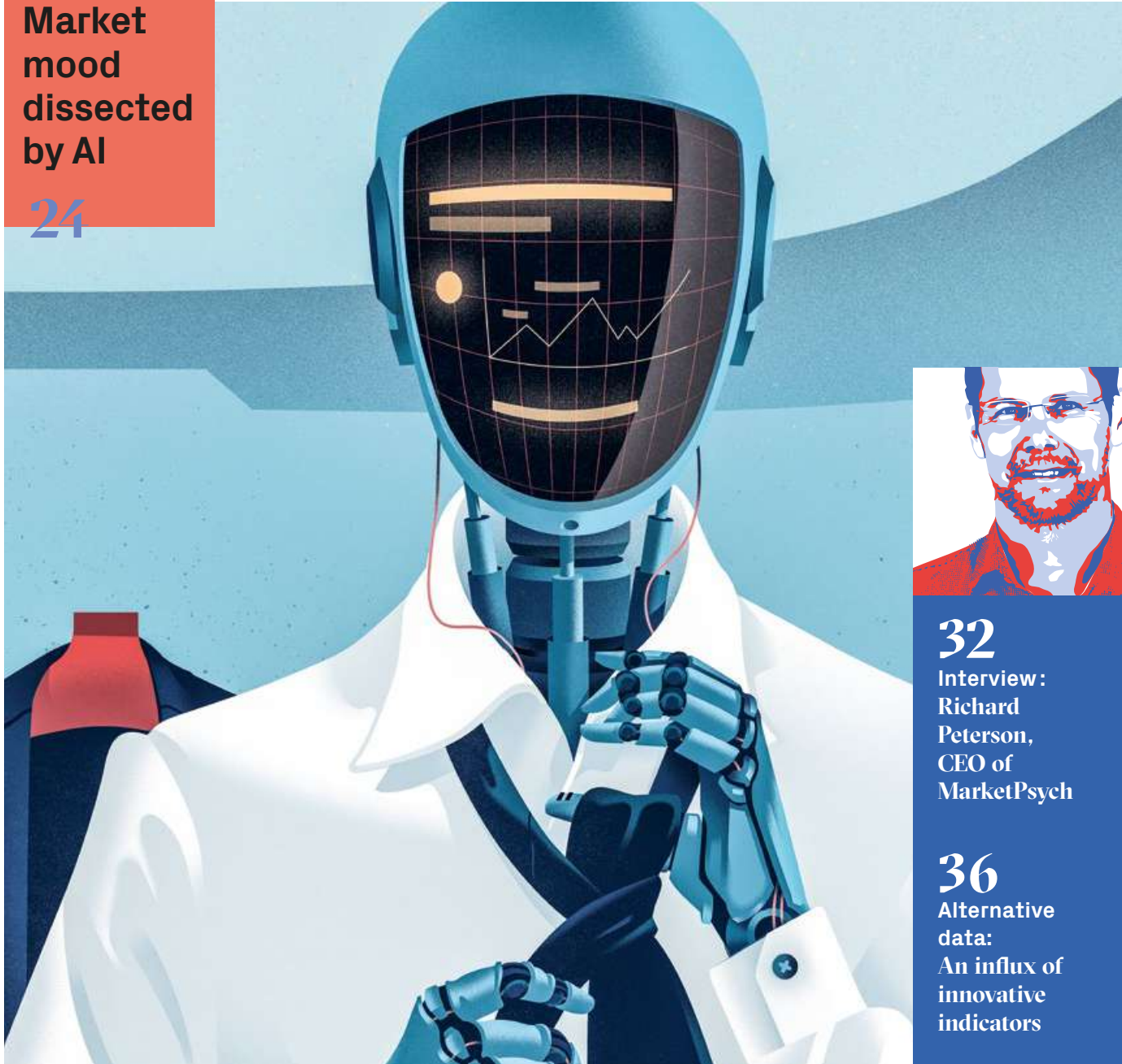
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TRAFFIC

## Robotaxis aren't making any friends

Robotaxis from Waymo and Cruise have started offering expanded routes for paying customers, after receiving approval to operate 24 hours a day in certain neighbourhoods of San Francisco. The two platforms, which were already present on some roads in Arizona, now operate nearly 500 vehicles in the California city. But not everyone is on board. A citizens' collective named Safe Street Rebel has started putting traffic cones on the bonnets of robotaxis, effectively shutting down their sensors. The group believes that self-driving cars make roads more dangerous and negatively affect the jobs of taxi drivers. Meanwhile, refuse collectors and fire-fighters say that they cannot pass on a street if a robotaxi breaks down.



**“The war in Ukraine is also an opportunity for French industries. Sorry to be blunt, but we have to accept it”**

**Sébastien Lecornu**, French Minister of the Armed Forces during an interview on France Info in late September.

## RANKING

**Top five most popular social media platforms**  
(by number of active users)

1. FACEBOOK  
**2.74 billion**
2. YOUTUBE  
**2.23 billion**
3. WHATSAPP  
**2 billion**
4. INSTAGRAM  
**1.22 billion**
5. WECHAT  
**1.21 billion**

Source: Statista

**Top five oil-producing countries**  
(in barrels extracted per day in 2022)

1. UNITED STATES  
**20,213,000**
2. SAUDI ARABIA  
**12,144,000**
3. RUSSIA  
**10,938,000**
4. CANADA  
**5,694,000**
5. CHINA  
**5,119,000**

Source: Energy Information Administration

**300 M**

**The number of copies sold of Microsoft-owned Minecraft, making it the best-selling video game of all time, far ahead of Grand Theft Auto V (185 million units).**

© JOSH EDELSON, AFP / XINHUA / IMA FASSBENDER, AFP



PAYMENTS

## WeChat adopts palm technology

The Chinese social network WeChat, a subsidiary of Tencent, already uses a QR-code payment system, but has recently launched a new solution where users can make purchases with just the palm of their hand. Users first link their handprint and unique vein structure to their WeChat account, and can then make contactless payments by placing their palm above

a surface equipped with high-definition cameras and infrared sensors that authenticate the user and automatically withdraw the funds from their account. The system is seen as less intrusive than facial recognition and more hygienic than fingerprints. It has already been launched in train stations, 7-Eleven convenience stores, restaurants and fitness gyms. → 0700



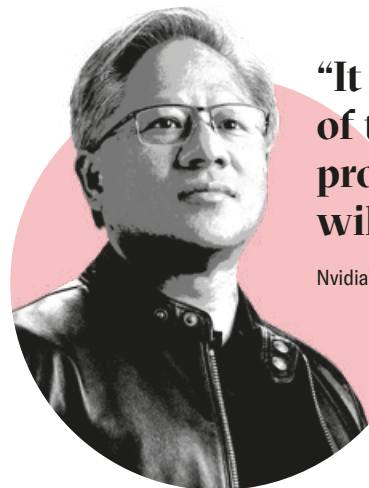
## THE IMAGE

The energy crisis experienced by Germany since the start of the war in Ukraine is having some surprising repercussions. In August, Germany's second largest electricity producer RWE dismantled seven wind turbines to expand Garzweiler open-pit coal mine in North Rhine-Westphalia. Environmentalists have criticised the "absurdity" of the decision.

**\$ 326 M**

**Uber's operating profit in Q2 2023. This is the first time the on-demand taxi and meal delivery service has been in the black. It has reported a \$31.5 billion loss since it started publishing its numbers in 2014.**





**“It is likely that one of the largest export products from India will be AI”**

Nvidia's CEO, **Jen-Hsun Huang**

#### WATCHMAKING

### Swatch hoping for repeat success

If it ain't broke, don't fix it. After the success of the MoonSwatch, a collaboration with Omega that brought in record profits last year, Swatch hopes to find the same level of success with its new offering. The Biel-based group has just launched a new collection with fashion house Blancpain. The five models, each named after an ocean, are inspired by

Fifty Fathoms, the famous diving watch created by Blancpain in 1953. The timepiece is made of bioceramic, a hybrid composition of ceramic and a mystery bio-material sourced from castor oil. It is waterproof up to 91 metres and is equipped with a SISTEM51 mechanical movement. Made of just 51 parts, its production is automated. → UHR



The full range of Fifty Fathoms watches, pictured here at the Swatch factory in Grenchen, last September.

**+10%**

The average increase in payments that artists signed with Universal will now receive via the streaming platform Deezer, following an agreement with the music label.

#### LEGAL WOES

### Google's monopoly under review

Google is in a showdown with the US Department of Justice (DOJ). The DOJ is investigating anti-competitive practices due to Google's monopoly of online searches. The California company is accused of paying more than \$10 billion per year to smartphone manufacturers to ensure that the Google search engine is installed on their devices as the default application. The stakes are high: in the first half of 2023, online searches brought in \$83 billion to parent company Alphabet, accounting for 57% of its profits.

→ GOOGLE

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Foundation stone laying ceremony for the SAIC Motor-CP factory, in Chon Buri, Thailand, on 30 April, 2023.

#### OFFSHORING

### Electric cars made in Thailand

Chinese electric vehicle manufacturers are investing heavily in Thailand. BYD, Great Wall Motor and SAIC are all expanding their production capacities, while several Chinese companies are also producing batteries in the country. These companies have committed to a combined investment of \$1.44 billion in Thailand. Burned by the sluggish Chinese economy

and a market approaching saturation, they hope to set up shop in new countries in Southeast Asia – where new vehicle sales increased 23% last year to reach 3.4 million units – as well as in the West. Thailand, which became a hub for automobile manufacturing in the 1970s when Japanese manufacturers arrived, is a neutral base for their EV ambitions.

#### ENERGY

### Implenia expands to floating turbines

Beyond depths of 50 to 70 metres, it's very difficult to moor a wind turbine on the ocean floor. To solve this problem and expand the areas where turbines can be installed, several manufacturers have begun developing floating versions (see the September 2023 issue of *Swissquote Magazine*). Zurich-based construction group Implenia is one of them. It recently partnered with Norwegian group NorSea to develop a hub off the western coast of Norway by 2032, where large steel and concrete structures will be built and assembled to be used as parts for the floating turbines. The facility will produce 70 floating turbines per year.

→ IMPN



Aerial view of an offshore wind farm in Finland.

#### THE QUESTION

**Taylor Swift's Eras tour boosted the American economy, bringing in \$1 billion. Have concerts become the cash cow of the music industry?**

Around 15 years ago, live music began to outpace recorded music as a key source of revenue in the music industry, particularly for mega-stars such as Drake, Harry Styles and Beyoncé. This movement led to a consolidation of the industry with a handful of major companies emerging, such as Live Nation Entertainment, AEG and Ultra Music Festival in the United States and Superstruct Entertainment and Festival Republic in the United Kingdom, all with strong vertical and horizontal integration. Most of these groups own concert halls, festivals and ticketing and merchandising companies. But live music remains a risky industry, with low margins of around 5%, depending on the audience and the weather. Given increased infrastructure costs (renting a venue or stadium, security, etc.), the event needs to be sold out to generate a profit. And even if a show is sold out, artists generally receive 85% of the takings, leaving only 15% to the promoter.

**Chris Anderton**, associate professor in cultural economy, specialising in the music industry at Solent University in Southampton, UK.





## “America is the piggy-bank of the pharma world”

**David Mitchell**, of Patients for Affordable Drugs, a group that represents American consumers.

# 10%

The percentage of grocery products sold online in the United States, compared to 7% in Europe.



### THE IPO

## Instacart goes public on the Nasdaq

The home delivery service Instacart went public on the Nasdaq in mid-September, reaching a valuation of \$10 billion. The company, founded in 2012 in San Francisco, saw its revenue soar during the pandemic, momentarily reaching a valuation of \$39 billion. It provides delivery services for supermarket chains Kroger, Costco and Wegmans, as well as pharmacy

CVS and cosmetics giant Sephora. Unlike its competitors Uber Eats, Lyft and DoorDash, which all remain in the red, Instacart has focused on profitability rather than growth. The company has turned a profit since Q2 of 2022, generating \$428 million in profits that year. In the first half of 2023, its profits reached \$242 million.

→ CART



### HEALTH

## Dr Amazon

After several months of testing, this summer the e-commerce giant launched Amazon Clinic – its telemedicine service – nationwide in the United States. That means that US customers can now get medical advice 24 hours a day, 7 days a week via the Amazon website or the dedicated mobile app. If a prescription is needed, patients are referred to the company's pharmacy service, Amazon Pharmacy, launched in November 2020 in the midst of the COVID pandemic. With this new foray into healthcare, Amazon is adding to its already vast offering via the One Medical service, the firm finally acquired in 2023 that also provides in-person primary care. → AMZN

In September 2022, Switzerland signed a contract to purchase 36 F-35As for 6 billion Swiss francs. They are scheduled for delivery between 2027 and 2030.



### DEFENSE

## The F-35, a fixer-upper

The programme has been an undeniable commercial success. Since its maiden flight in 2006, the US F-35 Lightning II fighter, manufactured by Lockheed Martin, has been snatched up fast across Europe and Asia. In the most recent sale, in late-September, the Czech Republic announced its official plan to buy 24 of the advanced fighter jets. In doing so, Prague joins countries such as Switzerland, Finland and Japan, which have all chosen the US Army's showpiece to defend their skies. However, the F-35 is experi-

encing some technical problems. A report from the US Government Accountability Office published last September stated that the F-35 – billed to the Pentagon \$160 million apiece – has a “fleet mission capable rate” of only 55%. The rest of the time, the aircraft is grounded for maintenance. This performance falls far short of the Department of Defense's original goals of 85% to 90% readiness. Since 2006, Lockheed Martin has manufactured nearly 1,000 F-35s (all versions), half of which serve the US military. → LMT

### SEMICONDUCTORS

## The chip war continues

In early August, China introduced restrictions on exports of gallium and germanium, two rare metals that are used to make semi-conductors, photovoltaic cells and certain military equipment (including night vision goggles, radar systems and sensors used in aviation). This caused an immediate shortage of these minerals, as China controls 80% of the global production of gallium and 60% of germanium. China's restrictions come against the backdrop of the recent US ban on exporting sophisticated chips to China as part of the trade war between the two countries.

© RICHARD B. LEVINE, ALAMY / NURPHOTO, AFP / JOHN MASHAK

# \$ 16 BN

The amount that Argentina must pay in damages after losing a lawsuit in the United States regarding the 2012 re-nationalisation of YPF, the country's largest oil company, which was detrimental to shareholders.



## “Consumers will vote with their wallets”

Apple has pledged to make all its products carbon-neutral by 2030. But Apple CEO **Tim Cook** believes that these products must not be more expensive, or customers won't follow suit.

A gallium oxide wafer pictured at Zhejiang University in Hangzhou, China, 30 May, 2022.



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The VF8 electric vehicle is a letdown

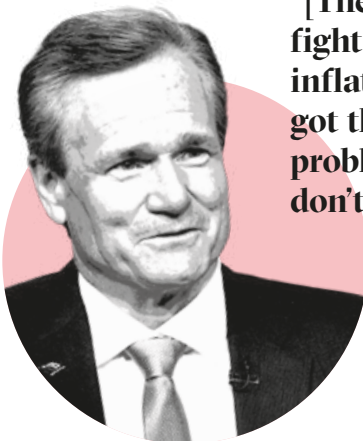
In mid-August, the Vietnamese electric vehicle manufacturer VinFast had a remarkable IPO on the Nasdaq, reaching a valuation of \$85 billion – nearly as much as Ford and General Motors combined. But the VF8, its first model released for the American market in early 2023, did not receive the same level of enthusiasm. The reviewers who test-drove it described the VF8 as having an inconsistent driving assistance system, with nausea-inducing suspension and poor interior quality. Some journalists received cars where the ventilation didn’t work at all. Between January and May, just 128 VF8s were sold, compared to the 50,000 that VinFast expected this year. → VFS



PAYMENTS

The United States discovers instant payments

Americans are living in the Stone Age when it comes to electronic payments: transactions are completed in batches after several days’ delay, via a system put in place 50 years ago. Peer-to-peer networks such as Venmo and Cash App offer instant transactions but they still rely on this ancient infrastructure on the back end. In an effort to modernise, the Federal Reserve introduced a new system for instant payments this summer called FedNow. Around 35 banks are already using FedNow, including JPMorgan Chase and Wells Fargo, but some banking giants such as Bank of America and Citigroup are yet to join.



“[The Fed is] winning the fight right now [against inflation]. But now they’ve got the equal, opposite problem to be careful they don’t go too far”

Brian Moynihan, CEO of Bank of America, in comments reported by Reuters on 27 September.

£600M

The amount BMW will invest in the United Kingdom to renovate its Oxford facility and maintain the production of the electric Mini at the site.

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Upgrade to Audi’s business class

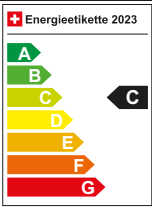
As an SME, you can benefit from special conditions on a range of models.

Audi Q8 e-tron from CHF 529.– / month

including 15% SME discount

Audi Q8 50 e-tron advanced quattro

Gross price	86 600.–
4.2% compensation	– 3630.–
11% EnterprisePlus (after compensation)*	– 9120.–
Your special price	73 850.–
Your discount	12 750.–
Annual interest for leasing	2,49%
Leasing rate per month	529.–



Audi Q8 50 e-tron advanced quattro, 340 hp, 21.6 kWh/100 km, 0 g CO<sub>2</sub>/km, category B. Leasing offer: special payment CHF 18 830.–, 48 months, 10 000 km per year. Price calculations according to table above. Displayed model: Audi Q8 50 e-tron Black Edition quattro, 340 hp, 23.2 kWh/100 km, 0 g CO<sub>2</sub>/km, category C. Chronos Grey Metallic, Audi Sport wheels, 5-spoke structure design, titanium grey, high-gloss turned finish, 9.5 J x 22, tyres 265/40 R 22, second charging socket, black roof rails, regular price CHF 100 260.–, compensation CHF 4210.–, EnterprisePlus discount CHF 10 560.–, cash purchase price CHF 85 490.–, down payment CHF 21 370.–. Leasing-rate: CHF 569.–/month, 48 months, 10 000 km per year. All offers exclusive of compulsory comprehensive insurance. The granting of credit is prohibited if it leads to over-indebtedness on the part of the consumer. Financing provided by AMAG Leasing Ltd. Offer valid for contracts concluded by 31 october 2023 or until further notice. Subject to change. Applies to all vehicles imported by AMAG Import Ltd. Suggested list price of importer AMAG Import Ltd. \* EnterprisePlus: commercial offer, only available for vehicles registered to companies with an entry in the commercial register.

Further attractive offers for SMEs





### Bitcoin on the school curriculum in El Salvador

Two years ago, El Salvador became the first country in the world to adopt BTC as legal tender. In early September, the Central American nation launched an initiative to incorporate Bitcoin education into all the country's schools. Some 150 educators will be trained so that they can teach students the basics of the cryptocurrency. Starting with 50 teachers from 25 schools, the pilot programme will be expanded nationwide by 2024.

### Deutsche Bank goes crypto

Germany's largest bank, Deutsche Bank, will be offering its institutional clients custodial services for digital assets. The finance giant (€1.3 trillion in assets under management) has partnered with the Swiss firm Taurus, which provides digital asset infrastructure. This is the first time Deutsche Bank will hold cryptocurrencies for its clients, as well as tokenised versions of traditional

### cryptos express

financial assets. Despite having no immediate plans to get into cryptocurrency trading, the bank expressed its intention to eventually offer crypto trading in a World Economic Forum paper back in 2020.

### Honda embraces crypto payments

The move represents another step towards widespread adoption of cryptocurrency payments. Since the beginning of October, Japanese automaker Honda has made it possible to use a range of cryptos to buy its cars, motorbikes and other equipment. The list includes around 46 tokens, such as Bitcoin (BTC), Ethereum (ETH), Ripple (XRP), Dogecoin (DOGE), Binance Coin (BNB) and Shiba Inu (SHIB). As part of this strategy, Honda is working with the Canadian firm FCF Pay, a blockchain-based cryptocurrency payment gateway. The Japanese automotive giant stated that it has not set any payment limits for its products and that cryptocurrencies can be used for financing and

payment in instalments, also via FCF Pay.

### Ether futures available in the United States

The United States moved forward a notch in the institutional adoption of cryptocurrencies with the launch in early October of the first exchange-traded funds (ETFs) based on futures on the Ethereum blockchain, called Ether futures. Investors can use these ETFs to speculate on future values of Ethereum without owning it directly. Within a few hours of its debut, about 2 millions in trades were processed. This is considered a lukewarm initial reaction compared to the \$200 million volume in the first 15 minutes of trading for the first Bitcoin futures ETFs (BITO) in October 2021 (albeit in a different economic climate). Several companies, including VanEck, ProShares and Bitwise, offer ether futures. The SEC, the US financial market regulator, has approved these products to prevent any single fund from dominating the market.



# Sam Bankman-Fried stands before his judges











The biggest crypto trial of the 21<sup>st</sup> century opened on 4 October in New York, almost a year after the spectacular collapse of the FTX exchange. Its founder and CEO Sam Bankman-Fried denies all charges despite the weighty case against him, which involves multiple counts of fraud and conspiracy, as well as money laundering. His ex-girlfriend and former CEO of Alameda Research, Caroline Ellison, a key witness in the trial, has accused her former boss of ordering her to commit these crimes. She could serve up to 110 years in prison – not much less than the 115 years Sam Bankman-Fried faces. The trial is due to end in mid-November.

↑  
FTX founder Sam Bankman-Fried arrives at Manhattan federal court (11 August, 2023).

### CRYPTOGRAPHIC

### Top crypto projects

By developer activity in September

Token	Market capitalisation	Price change (30-day)	Developer activity* (30-day)
 Cardano (ADA)	\$9.42 BN	+4.87%	572
 Polkadot (DOT)	\$5.21 BN	+1.28%	501
 Chainlink (LINK)	\$4.39 BN	+33.3%	388
 Hedera (HBAR)	\$1.73 BN	+5.07%	358
 Cosmos (ATOM)	\$2.73 BN	+10.9%	338
 Aptos (APT)	\$1.33 BN	+1.42%	248
 Avalanche (AVAX)	\$3.42 BN	-1.46%	242
 IOTA (MIOTA)	\$432 M	-3.26%	219
 Radix (XRD)	\$595 M	+12.5%	167
 MultiversX (EGLD)	\$669 M	+3.60%	162

\*Measured by activity in public Github repositories.



**DAVID ENDICOTT**  
CEO of Alcon

**“BY 2050, HALF THE POPULATION WILL BE SHORT-SIGHTED”**

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© ALCON

Swiss group Alcon, which specialises in ophthalmology products, is thriving since its split from Novartis in 2019. CEO David Endicott explains the upsides of the company's independence. Find out more in this interview.

BY JULIE ZAUGG

**Besides 2020, the year in which the COVID crisis emerged, Alcon sales have increased year on year since it left Novartis in 2019. How do you explain that growth?**

Our sales, revenue and earnings have all increased. This is because when we were part of Novartis, subsidiaries such as Alcon were considered a source of profit rather than a source of growth. We didn't always have access to the investments we needed. Now, as an independent entity, we were able to take back control of our balance sheet, invest in

research & development, strengthen our infrastructure and make acquisitions that will allow us to grow in new markets. Our current growth figures show that the investments we've made since 2019 are paying off: we've developed several new contact

lenses and improved our manufacturing capacities, which have increased sales. Today, we have more than 100 products in the pipeline in the research & development phase.

**“Our current growth figures show that the investments we've made are paying off”**

**D**avid Endicott, CEO of Alcon, is full of optimism and confidence. His multinational, headquartered in Geneva, boasts a solid balance sheet in 2023. In the first six months of the year, revenue was up 8.2% compared to the same period last year, and operating margin improved by 1.2 points, reaching 11.4%. With that data in mind, the company revised its outlook for the year upwards in August. It now forecasts annual revenue of between \$9.3 billion and \$9.5 billion, up between 9% and 11% on 2022. Investors have responded accordingly: in the first nine months of the year, Alcon shares were up nearly 10%.

#### ALCON IN NUMBERS

**100+**

The number of products currently in the research & development phase at Alcon.

**45%**

The percentage of Alcon revenue generated by sales in the United States in 2022.

**7.8%**

The operational margin in 2022.

**Doesn't the current economic context, given inflation, impact your business?**

Yes, it does. Inflation has affected us considerably, in everything from salaries to the price of raw materials. We've also experienced disruptions in our supply chain. Much of our equipment works using the same semi-conductors used in the automobile industry, and we're seeing a global shortage of those. In the same vein, it's become difficult to obtain other raw materials (resins, aluminium, etc.) at a reasonable price, and even cardboard packaging, since the economy is still feeling the effects of the pandemic.

**In the longer term, will Alcon be able to sustain its growth?**

The population is ageing. Vision loss is one of the primary concerns for seniors. When someone loses their eyesight, they can no longer read, or they might fall. Governments are prepared to finance treatments for visual im- →



David Endicott at a presentation on the Alcon campus in Fort Worth, Texas (September 2023).

pairments because treatment allows people to stay at work longer and older people to maintain their independence, which is advantageous socially and economically. At the same time, we're experiencing a myopia epidemic. By 2050, half the population will be short-sighted. And a large number of these people – including in developing countries – are turning towards contact lenses. In rich countries, laser surgery, which permanently corrects myopia, is also becoming more popular. All of these changes benefit Alcon.

**In 2022, you acquired US companies Ivantis and Aerie Pharmaceuticals, two groups that specialise in glaucoma treatment. What will these acquisitions bring to Alcon?**

Glaucoma is one of the two or three biggest vision problems that affect humanity. It's a disease with no cure, but we can stop its progression by maintaining intraocular pressure at a sufficiently low level. Acquiring Ivantis gave us access to their Hydrus Microstent technology, which places a stent

© ALCON

to divert some of the liquid in the eye to the peripheral vascular system, thus lowering intraocular pressure. Data from a study conducted by Moorfields Eye Hospital, a private clinic in London, showed that two thirds of patients no longer needed eye drops to lower their eye pressure five years after the operation. The Aerie acquisition allowed us to obtain two new molecules that are sold in the form of drops. One of them, Rocklatan, reduces intraocular pressure when prostaglandin analogues, which are generally used as a first line of treatment, become less effective.

**Alcon is known for its contact lenses. What innovation can you bring to this decades-old market?**

Our Dailies Total 1 contact lens is equipped with unique technology that allows the synthetic material it is made from to retain a significant amount of water. This makes the lens more comfortable to wear. But it's a premium product. So there was space in the market for mid-range contact lenses, which we occupied with our Precision 1 range. To develop this product, we had to find a more cost-effective way to apply our technology to the lens. The result is a lens that is almost as effective as

the original but at a lower price point. We've also launched a reusable contact lens called Total 30, which remains comfortable to wear for an entire month.

**But the market for reusable contact lenses is shrinking. Why invest in this segment?**

Indeed, over the last 20 years, consumers have moved away from reusable lenses. They prefer disposable products that let more oxygen in and don't require daily cleaning with

## BIOGRAPHY

### PHARMA CAREER

When he became CEO of Alcon in 2018, American David Endicott already had significant experience in the pharmaceutical and eyecare industries. Before joining the Geneva-based group in 2016 as CEO and president in charge of commercial and innovation, he spent 2014 to 2016 as president of US company Hospira Infusion Systems, owned by Pfizer, where he was in charge of medical equipment. Before that, he spent 27 years at US pharmaceutical laboratory Allergan in several leadership roles across Europe, Asia, Latin America and the United States. At Allergan, he was responsible for growing new markets for ophthalmology, plastic surgery and aesthetic medicine. David Endicott, 58 years old, holds a Bachelor of Arts (BA) in chemistry from Whitman College (Washington state) and an MBA from the University of Southern California.

a solution. But a significant portion of the population can't afford disposable lenses. We were losing market share to our competitors because our reusable lenses were based on a technology that was more than 20 years old. The Total 30 line will allow us to regain that market share.

**Alcon also has its own brand of devices and implants to treat cataracts, retinal detachments and age-related macular degeneration. A fast-growing field...**

In the two years after the split with Novartis, the intraocular implant market brought us a first wave of growth, particularly as we launched the PanOptix trifocal lens designed for cataract patients. Since then, we've launched another intraocular implant called Vivify. It's non-diffractive, which means it minimises flashes and the halos that people with these implants sometimes see when they look at a light at night. Another innovation is cataract surgery. We've developed a system that digitises

the process. Surgeons have access to all of the patient's data in the operating room, which →

**“There was space in the market for mid-range contact lenses, which we have occupied”**



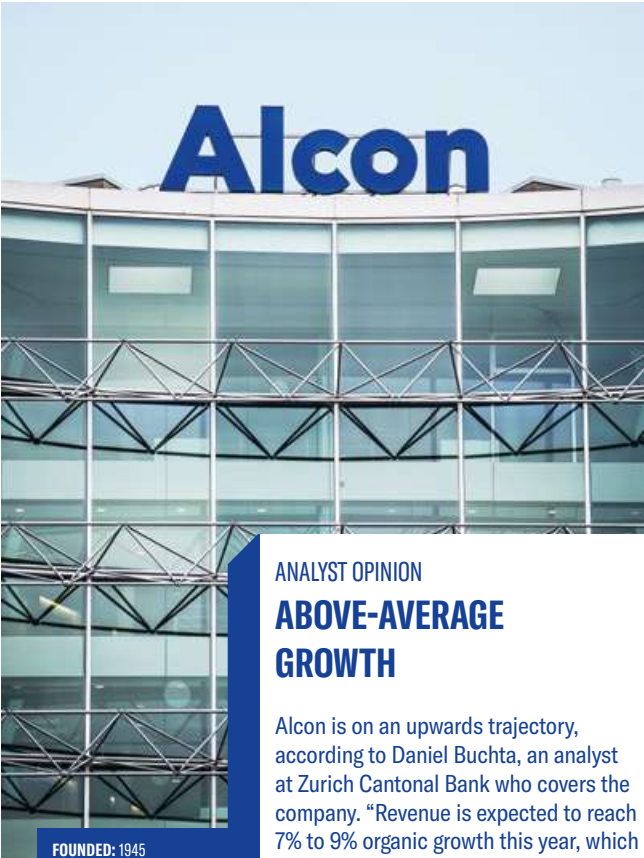
makes surgery more precise and can be used to automate certain calculations. The algorithm improves over time thanks to a machine learning process.

**You’ve also recently expanded your vision care line to include toric lenses (for astigmatism) and multifocal lenses (for long-sightedness). Was there something missing in these categories?**

When we launched the Dailies Total 1 line, we weren’t able to market a toric or multifocal lens because that required a significant investment in our means of production and we didn’t have the funds available. As an independent entity, we now have the funds available to do so and have launched toric and multifocal versions for our three lenses (Dailies Total 1, Precision 1 and Total 30). We see many opportunities in the multifocal market in particular. A significant number of contact lens wearers move away from lenses around the age of 40 because they need reading glasses anyway, and as a result stop wearing lenses daily. Multifocal lenses should keep consumers in the contact lens market for longer. That said, we have a lot to accomplish yet. Multifocal lenses still don’t work as well as they should. But we’re working on it. ▲

BETWEEN GENEVA AND TEXAS

Alcon’s headquarters, located in Geneva, Switzerland, are home to 650 employees, compared to 3,300 in Fort Worth, Texas, where the primary research laboratories are located. Founded in 1945 as a pharmacy specializing in sterile ophthalmology products, the company became a subsidiary of Nestlé in 1977, then Novartis in 2010. In 2019, it regained its independence as part of a spin-off transaction orchestrated by the Basel-based pharmaceutical group.



FOUNDED: 1945  
HEADQUARTERS: GENEVA (CH)  
EMPLOYEES: 23,792  
2022 REVENUE: \$8.7 BILLION  
→ ALC

ANALYST OPINION  
ABOVE-AVERAGE  
GROWTH

Alcon is on an upwards trajectory, according to Daniel Buchta, an analyst at Zurich Cantonal Bank who covers the company. “Revenue is expected to reach 7% to 9% organic growth this year, which is above average for the industry,” he says. In the surgical sector, where Alcon is the undisputed global industry leader with a 45% market share, the gains are driven primarily by the launch of two new intraocular implants – PanOptix and Vivify – as well as a catch-up effect. “Most eye operations were delayed during the pandemic, and then hospitals found themselves short-staffed, particularly in the United States,” says the analyst.

In the contact lens sector, “Alcon has launched new products that filled certain gaps in its portfolio left over from underinvestment in research & development and production capacities in the Novartis era. This has allowed Alcon to gain market share from the global leader Johnson & Johnson.” But to maintain growth, the company cannot rest on its laurels. “It must constantly innovate to not lose ground to competitors,” says Daniel Buchta. In the surgical sector, Carl Zeiss is looking to regain market share. In the contact lens segment, CooperVision is the primary competition, alongside Johnson & Johnson. The analyst has issued an Outperform recommendation.

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BANGKOK **Pendulum** - DUBAI **Ahmed Seddiqi & Sons** - KUALA LUMPUR **SHH** - MONACO **Art in Time** - NEW YORK **Cellini Jewelers**  
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D O S S I E R

# Market mood dissected by AI

Advances in artificial intelligence provide ever more granular market sentiment analysis that can be used to predict price trends. Will this make traditional economic indicators a thing of the past? The experts weigh in.

BY LUDOVIC CHAPPEX

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CEO of  
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oring over business news, scouring trends on social media, sifting through corporate activity reports, etc. What if this ritual, so familiar to the most thorough investors, was relegated to the history books? Seemingly unstoppable, artificial intelligence (AI) shows us a bit more every day its

phenomenal ability to analyse and process a colossal flow of information, much faster and more efficiently than a human brain can. This miracle is made possible by Natural Language Processing (NLP), a branch of AI that uses machine learning to understand the structure and meaning of text.

Applied to the world of finance, this technology is used to analyse market sentiment, i.e., the general feeling of investors towards an asset or the market as a whole, virtually in real time. But can it predict changes in stock prices?

Results seem to suggest that it can. For example, the US Federal Reserve (Fed) – hardly known for its frivolity – has recently developed the Twitter Financial Sentiment Index (TFSI). In a research report entitled “More than Words: Twitter Chatter and Financial Market Sentiment”, posted on its website in May, the Fed writes: “We build a new measure of credit and finan-

cial market sentiment using Natural Language Processing on Twitter data... We document that overnight Twitter financial sentiment helps predict next day stock market returns. Most notably, we show that the index contains information that helps forecast changes in the US monetary policy stance: a deterioration in Twitter financial sentiment the day ahead of an FOMC (ed. note: Federal Open Market Committee) statement release predicts the size of restrictive monetary policy shocks. Finally, we document that sentiment worsens in response to an unexpected tightening of monetary policy.”

Other similar work positively evaluates market sentiment analysis based on press articles. Published in 2022 by two researchers from the Zurich University of Applied Sciences (ZHAW), the study “Using Financial News Sentiment for Stock Price Direction Prediction” tests natural language processing to extract market sentiment information from news articles and predict price direction of the

S&P 500 stock market index. The authors conclude that “the results show that sentiment scores based on news content are particularly useful for stock price direction prediction”.



Didier Sornette, professor emeritus at the Chair of Entrepreneurial Risks at ETH Zurich

**“Market sentiment is like a photograph, a very detailed photograph, which can then be added to the toolbox to help predict prices and future risks”**

Several tech companies have dived head first into the technology hype, offering turnkey AI-based market sentiment analysis tools to their clients (banks, hedge funds and pension funds). The California-based company MarketPsych (see CEO interview on p. 32) and the Spanish-American firm RavenPack are among the pioneers and leaders in this field. →

## ChatGPT-4, changing everything

### The famous language model shows real talent as an investor.

Are you looking for a solution that’s accessible to anyone, easy to use, and outshines solutions from other companies specialising in AI-based market sentiment analysis? Look no further than ChatGPT-4, the star of the day, to shake things up. A much talked about study from the University of Florida, published in April, claims that the omnipresent language model outperforms its more traditional rivals in predicting stock price movements based on news headlines. “We use ChatGPT to assess whether each headline is good, bad, or neutral for firms’ stock prices,” the study’s authors wrote. “We document a significantly positive correlation between ChatGPT scores and subsequent daily stock returns. We find that ChatGPT outperforms traditional sentiment analysis methods.”

The authors point out that long-short strategies, i.e., a mix of long and short positions in different stocks, based on ChatGPT-4 “deliver the highest Sharpe ratio” (a financial indicator used to measure the return of an investment compared to the risk taken).

Does this revolution mean the end of market sentiment analysis companies? The CEO of the California-based firm MarketPsych sees it more as an opportunity to enhance

their own tools, underscoring that ChatGPT-4’s ability to interact with humans is a major step forward (see his interview on p. 32). Norman Schürhoff, professor of finance at the University of Lausanne, shares this viewpoint. “Established players like MarketPsych or RavenPack primarily bring value through the data they provide and have stored, not via their machine learning technology,” he says. “They can and probably will adapt their processes over time to remain best-in-class. In other words, the methodology (ChatGPT-4) is a complement to, not a substitute for, the data.”

Moreover, it is worth noting that in the University of Florida study, ChatGPT was exclusively used for stock picking, i.e., it selected stocks one by one that it would offer to buy or sell. It did not measure the value of all stocks on the market. Now the question that comes to mind is: how will everyone be able to use this tool?

“ChatGPT-4 has not been specifically developed for stock market forecasting, and machine learning methods need to be adjusted to suit the purpose,” Norman Schürhoff says. “Finance is no exception. ChatGPT-4 will progressively be adapted to better handle financial data and questions.”



## The emotion-driven crypto market

“The younger an asset, the more sensitive it is to behavioural finance.” This remark made by Julien Leegenhoek, founder and CEO of financial data company Taranis, captures the observable correlation between cryptocurrency prices and market sentiment. No other asset is as influenced by emotional components. “Market sentiment analysis tools seem to me to be better suited to the cryptocurrency market than to stocks,” says Amit Goyal, professor of finance at the University of Lausanne. “Cryptos are a much smaller market (ed. note: currently around \$1 trillion compared with more than \$100 trillion for the equity markets), which is far less liquid, more subject to speculation and potential

manipulation, and with a proportionately higher number of retail investors. The market can be more easily influenced by the news and social media posts.”

This type of environment is where AI-based sentiment analysis tools shine, and tech firms in the sector are not hesitating to make good use of them. This observation amuses Didier Sornette, professor emeritus at the Chair of Entrepreneurial Risks at ETH Zurich: “Cryptos have no fundamental economic value! So it’s not surprising that they are mainly sensitive to market sentiment. It’s a tautology. The market is shaped by beliefs that are grounded in hope, hype and greed.

Put simply, these companies harness the millions of bits of news from the financial press, blogs and social media, and transform this data flow into actionable indices for investors. To achieve that, the first challenge is to build up a good database of sources with a reputation for being reliable. The next step is to define one or more themes using keywords, such as inflation, unemployment, COVID, recession, etc.

These various themes are automatically detected by the NLP tools, which then generate statistics or a summary. The idea is to produce an assessment of the crowd’s feelings (positive, neutral or negative) towards a given theme or company. RavenPack boasts that it can deliver a snapshot of the market practically in real time. “The machine can collect data, analyse it and provide the client

with an analysis in less than half a second,” says company CEO Armando Gonzalez.

But how useful is market sentiment analysis? Can it replace traditional economic indicators? And more relevantly, what is its real predictive power? “These methods are reliable,” says Norman Schürhoff, professor of finance at the University of Lausanne and the Swiss Finance Institute. “Ample evidence now confirms that news and social media provide valuable information. But market sentiment analysis should not be viewed as a substitute for traditional fundamental economic indicators. Rather, it complements and refines the predictive power of economic indicators.”

This opinion echoes that of other academic experts that we contacted, such as Didier Sornette, professor emeritus at the Chair of Entrepreneurial Risks at ETH Zurich. “Market sentiment is like a photograph, a very detailed photograph, which can then be added to the toolbox to help predict prices and future risks.”

### Data sets the tone

While experts agree on the value of market sentiment analysis, they all highlight the crucial importance of the quality of the data processed by AI. RavenPack CEO Armando Gonzalez wholly agrees, “Storage capacity and computer speed have taken a giant leap forward, but the challenge remains isolating



Norman Schürhoff,  
professor of finance  
at the University of  
Lausanne and the  
Swiss Finance Institute

**“The quality of the source is key, if you agglomerate information indiscriminately from the average of all influencers, you’ll lose money”**

the right data. Good data is the basis for all models.”

In other words, simply taking in everything that is said on social media is an accident

waiting to happen. Norman Schürhoff led a study published by the Swiss Finance Institute on 25 April, entitled “Finfluencers” (ed. note: portmanteau of financial influencers), which explains the phenomenon. This research estimates that 56% of influencers have “negative skill” or “antiskill” at predicting prices, generating -2.3% monthly abnormal returns, and only 28% are skilled, generating 2.6% monthly abnormal returns. “The advice by antiskilled finfluencers creates overly optimistic beliefs most times and persistent swings in followers’ beliefs,” the authors write. “Consequently, finfluencers cause excessive trading and inefficient prices.”

“The quality of the source is key,” Norman Schürhoff says. “If you agglomerate information indiscriminately from the average of all influencers, you’ll

lose money. But if you choose the best influencers as sources and filter this information using NLPs, the result is useful.” He adds, “Taken as a whole, the predictive power of social media is more random than that of financial press articles, but our study shows that with the right methodology, you can obtain valuable information.”

In addition to the careful data selection, the sheer quantity of data combined with maximum exploitation of NLP tools ultimately delivers the best performance. “Our research shows that the more data you aggregate, provided you choose the right data, and the more you use different NLPs, the higher the chance for outperformance,” says Matthias Uhl, head of Analytics & Quant Modelling at UBS, who is also a lecturer at the University of Zurich and the Swiss Finance Institute. →

### Oil prices: sentiment as a barometer

**Sentiment vs Crude oil price**

This index, developed by RavenPack, shows that the actual supply of crude oil is correlated with sentiment towards crude oil supply. According to RavenPack, an increase in the sentiment index suggests a reduction in production, leading to a rise in crude oil prices – and vice versa.



SOURCE: RAVENPACK



Could fortune be at the end of the AI rainbow, provided you feed the machine good data? Amit Goyal, professor of finance at the University of Lausanne, doubts it. “With or without these technologies, a fundamental question remains: is it actually possible to predict prices? Several Nobel Prize winners in economics have argued that it’s simply not possible to predict changes in market prices. It’s a subject of ongoing debate among economists.”

“There is no consensus on anything in economics,” Didier Sornette says with a smile. “We’re divided into schools!” Relatively cautious about these new tools, the ETH Zurich professor continues, “AI and machine learning have become much more powerful, but the resulting improvement is more quantitative than qualitative.

AI can provide ever more in-depth analyses, but it’s actually just deciphering the crowd’s stupidity (or intelligence).”

The challenge is not exactly the same between predicting prices in the short term and in the long term. “In the short term, behaviour is everything! The nearer in the future, the less sensitive price variation is to fundamentals,” says Julien Leegenhoek, founder and CEO of Taranis, a Geneva-based company that uses AI to analyse alternative data (including market sentiment).

As for Matthias Uhl of UBS, he emphasises the importance of economic fundamentals when taking a long-term investment perspective. “Asset managers need indicators that are reliable over one, or even two, economic cycles, and I have not seen



Armando Gonzalez,  
CEO of the company,  
RavenPack

“Market sentiment analysis will also cover video streams”

social media sentiment indicators work reliably over such a long period. That’s why it’s important for investors not to limit themselves to one speciality.” On this note, Matthias Uhl adds the following anecdote, “I teach students who are sometimes experts in AI; some have

mastered machine learning applications in finance, but these same students sometimes have no knowledge of how the economy works, which is equally important if you want to beat markets.”

Paradoxically, the other problem with these technologies relates to their democratisation. A key notion in investing is having information that others don’t have, or don’t have yet. Even so, more and more companies are bringing their solutions to market, not to mention AI tools that anyone and everyone has access to, such as ChatGPT. The latest version of the ubiquitous conversational agent offers astounding results in stock-picking based on market sentiment (see p. 27). But its services are aimed at billions of potential investors, making it harder to stay a step ahead.

Matthias Uhl from UBS draws an interesting parallel: “Look at the P/E ratio (Price-Earnings Ratio), which most investors still look at today. The usefulness of this indicator has gradually gone down over the last decades, whereas in the 1970s and 1980s it proved to be a valuable indicator.”

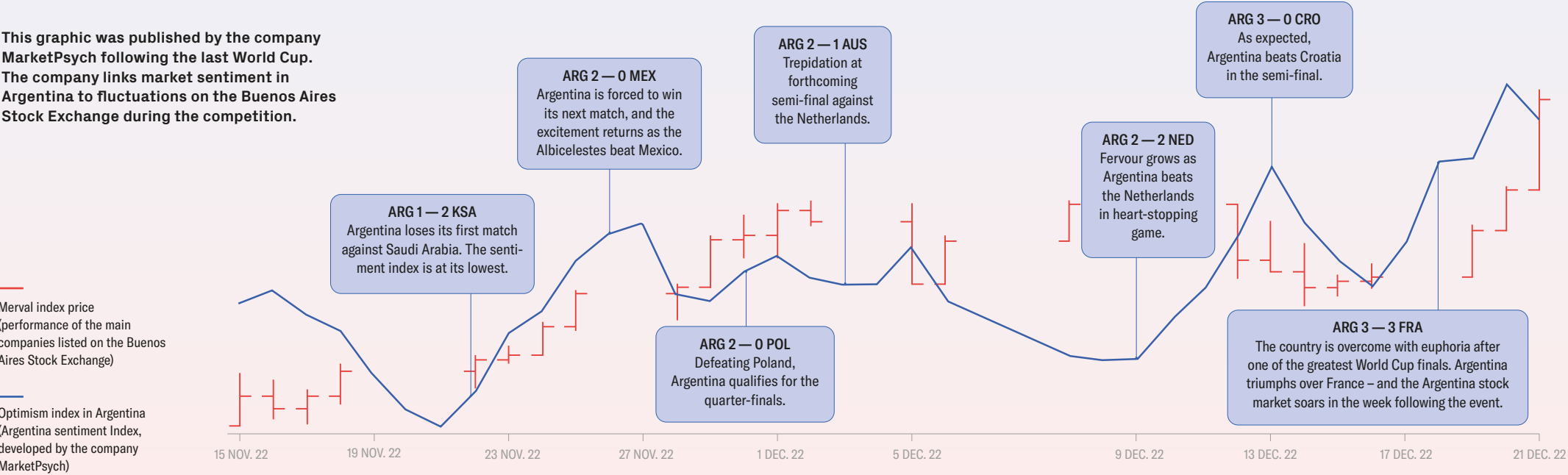
What’s in store for the future? “Market sentiment analysis will also cover video streams,” says Armando Gonzalez, CEO of RavenPack. The idea is to identify specific behaviours. “The next step will be voice and video analysis of behavioural signals from CEOs and central bankers,” agrees Norman Schürhoff of the University of Lausanne. “Machine learning methods will be developed to understand and explore individuals’ motivations. This type of research could help to make long-term forecasts.”

Fear & Greed, the old-school approach

The Fear and Greed index, launched in 2012 by CNN Money, is frequently used as a measure of investor sentiment (on a scale of 0 to 100). But unlike market sentiment analysis based on machine learning and text mining (the subject of this report), the Fear and Greed index is calculated using traditional financial indicators, such as share price movements, safe haven demand, and put and call options. The index therefore presents a glimpse of investor sentiment based exclusively on historical data and market movements that have already occurred. Sentiment analysis derived through machine learning reflects more the literal sense of the term. It captures the mood expressed in real time in the press and social media. This approach therefore provides a more immediate and sometimes forward-looking view of the mood on the market.

When optimism boosts stock prices

This graphic was published by the company MarketPsych following the last World Cup. The company links market sentiment in Argentina to fluctuations on the Buenos Aires Stock Exchange during the competition.



SOURCE: MARKETPSYCH



# “You can watch the activity minute by minute”

The American behavioural economist and psychiatrist Richard L. Peterson is the founder and CEO of MarketPsych, a company at the forefront of AI-powered analysis of market sentiment. We spoke to him to find out more... BY LUDOVIC CHAPPEX

Imagine a company that collates information from press articles and social media messages to capture market sentiment in real time. Welcome to MarketPsych. The US company achieves this feat by using machine learning, the branch of artificial intelligence that enables machines to detect patterns and make decisions on their own.

MarketPsych's natural language processing (NLP) tools extract and analyse immense quantities of data

in real time. With around 15 employees, most of whom are AI experts, the company claims to cover news on more than 30,000 companies, 300 cryptocurrencies, 44 currencies and 53 commodities, all in 12 different languages based on more than 4,000 sources (financial press, blogs, social media). This data is used by banks, hedge funds, financial analysts and pension funds.

The company's founder and CEO, Richard L. Peterson, spoke with us in an interview via Zoom from his Californian office.

**Can investors really use market sentiment, rather than financial data, to decide which stocks to buy or sell?**

Yes, definitely. If people are angry with a company, for example, you can expect its share price to fall in the short term but then rise later on. That's often what happens when the company's management has done something morally wrong. Shareholders tend to overreact based on their emotions and sell their shares at a price that is not economically rational. So crisis periods often represent an opportunity. A few years ago, we set up a strategy that consisted in buying shares in the 10% of companies that caused the most anger on social media. These companies tended to

outperform the market the following year. It was a sort of anti-ESG strategy... We bought shares in companies that everyone hated. But the fact is that these companies often improve after that and sometimes even become leaders in sustainable development and governance.

**“Social media acts as an accelerator”**

In terms of ESG, we will soon come out with a predictive index based exclusively on these criteria. Take a look at Apple

stock (ed. note: he's sharing his screen). You can see how many people are talking about Apple on social media in relation to ESG topics. You can watch the activity minute by minute. This activity and the crowd's opinions can guide future share prices.

**You believe that the sentiment expressed in the news and on social media influences share prices. But isn't it actually the other way round?**

It works both ways. If a share price suddenly falls by 10%, the media will produce a narrative to explain why. If enough people believe it and negative sentiment emerges, this will end up generating a future decrease in the price. It's a self-perpetuating scenario. →

## Richard L. Peterson: Psychology and finance all in one

The founder and CEO of MarketPsych is perfect for the job. This American psychiatrist is an expert in neuroeconomics and behavioural finance and has written a number of books and academic articles on these subjects. His 2007 book, *Inside the Investor's Brain*, popularises the concepts of behavioural finance. In 2016, he published *Trading on Sentiment*, in which he shows that there is a pattern

between investor sentiment, as reflected in the news and social media, and price fluctuations on the markets.

Richard Peterson is a medical doctor and did postdoctoral research in neuroeconomics at Stanford University. In the field of education, he has developed financial personality tests. He lives in California with his family.



But sometimes the sentiment expressed precedes the market movement. Investors are always telling themselves a story. For instance, they tell themselves that if interest rates rise, share prices will fall. This pessimistic scenario is picked up in the news and on social media, and it winds up influencing prices.

Social media, in particular, acts as an accelerator. There have been some salient examples of this recently. We recall when the share price of video game retailer GameStop surged following all the buzz on social media.

**The cryptocurrency market is notoriously volatile. Is it more sensitive to market sentiment than equities?**

Yes, that's what we've seen. In the crypto sector you can very frequently see sentiment emerge before a price movement occurs. For example, before the LUNA token fell last autumn, we could clearly see sentiment moving in a negative direction, even before the last spike upwards. For each crypto, we track a huge number of parameters based on keywords, such as adoption, developer sentiment, code updates, transaction speed, FOMO (ed. note: fear of missing out) or potential cyberattacks. Generally speaking, the top three cryptocurrencies tend to outperform the market.

**In practical terms, how do you go about analysing market sentiment?**

We use a lot of open-source

natural language processing tools, such as spaCy or more recently Meta's Llama 2, but we adapt them to finance. Especially on social media, messages are very short, so the tools have to take into account the economic context.

**“If I can make 10% consistently with low volatility, that's great”**

I can show you some of the indices we offer (ed. note: he shares his screen). Our customers have access to this platform. In this window, for example, we extract the information every time social media or news outlets take an interest in a company. The large language models (LLM) collect all the comments and news from the last hour and summarise it in a very short text of a few lines for each firm. This basically reflects the pulse level, i.e., the extent to which the market's attention has been stimulated about a given company, and the general feeling about it. Users can set their preferences based on several criteria, for example by selecting a specific country. Take Swiss companies listed on the stock exchange: here we can

see the sentiment expressed about each of them almost in real time.

**So does it work?**

As various studies have shown, our data is mostly predictive for currencies, bonds, commodities and cryptocurrencies. We provide detailed global sentiment indicators on these areas.

In 2020, we also launched a product designed to predict share prices. Most companies fail in this area after launching their product, as it is difficult to develop signals

that remain consistently predictive over a long period of time. However, since its launch, our model has remained useful in predicting price changes in US and Japanese stocks over the next 30 to 90 days.

However, we do not claim to be able to predict price movements systematically. There is currently no academic consensus in this area. Several academic studies suggest that there is no proven predictive power for prices based on market sentiment data.

The important thing when trying to predict stock prices is to do it well. You have to let go of the dream of getting annual returns of 30% or 40%, and just say to yourself, okay, if I can make 20%, that's great. If I can even

make 10% consistently with low volatility, that's great too.

**Do your solutions work best at predicting the market over the short, medium or long term?**

Different approaches are possible. Data can be collated and updated every minute, every day or monthly. It all depends on what the client needs, whether they are traders, pension funds or insurance companies. Our next product, due out in January, will analyse data within 140 milliseconds.

**“We expect costs to come down over time and capacity to increase”**

It's worth pointing out that the shorter the averages are, the more extreme the peaks and troughs will be. If you only look at the daily change in sentiment, it can be difficult to understand what's going on, but when you take an average over longer periods, for example one to three months, the picture becomes much clearer.

**A study published last April showed the accuracy of ChatGPT-4 in stock picking based on market sentiment. To what extent is this tool a “game-changer” and a competitor for you?**

These tools are game-changers because they have a chat interface. Investors can therefore interact with them and ask very specific questions, enabling them to make better use of the data. They also have an increasingly detailed understanding of the context in which a text is written, and can then interpret the meaning of a word much more accurately.

However, as far as ChatGPT goes, it is not specifically designed to have predictive ability. It uses historical data and will therefore be inclined to produce an estimate based on that data, which often results in over-reliance on the past. We believe there are other algorithms out there that are better at building long-term models.

**How do you see the future of sentiment analysis in the markets, given the rapid evolution of technology?**

The tools for extracting useful information from text are advancing quickly. We can now use large language models (LLMs) to extract deeply embedded signals from 100-page regulatory reports and large volumes of seemingly meaningless comments on social media. But these GPU-based technologies are still expensive due to the computational power required. We expect costs to come down over time and capacity to increase. So the needle in the haystack will be easier to find. ▴

**The psychological flaws of traders**

**Given his extensive knowledge of behavioural finance, we took the opportunity to ask Richard L. Peterson about the subject, which is closely related to our feature. Here is an overview.**

**What are investors' most common behavioural or emotional biases?**

The behavioural biases and prejudices of individual investors are very different from those of professionals. Individual investors tend to get caught up in trends and bubbles. They also tend to ignore information that is not compatible with their convictions. Professional investors are careful not to fall into these traps. They know that there is a cost-benefit advantage to positioning themselves against the dominant narrative. But because of that, they sometimes completely miss certain emerging trends or technologies.

We have also noted that professionals do not put enough money into trades where they have a strong conviction. Yet these trades generally outperform their other investments. We can see afterwards that they should have concentrated their investments more.

Another interesting observation is that professional traders have good timing for investment but poor timing when it comes to selling. They often wait too long to reposition themselves and end up selling when the share price collapses after a news item (or a tweet) that has nothing to do with economic fundamentals.



## ALTERNATIVE DATA

# An influx of innovative indicators

**In addition to gauging market sentiment, AI collects data that is useful to investors from an increasingly broad range of sources. Credit card transactions, satellite imagery, online searches and geolocation coordinates: machines comb through it all.**

BY LUDOVIC CHAPPEX



Without data, you're just another person with an opinion." The famous quote from the American statistician Edwards Deming, who died in 1993, has never seemed more relevant than in the present day. In the world of finance, the scope of usable data to gain an edge over the market is continuously expanding. In stark contrast to traditional economic indicators, this so-called alternative data is plucked from a variety of sources. The mix includes credit card transactions, web traffic, mobile devices, IoT (Internet of Things) sensors, weather forecasts, satellite imagery, corporate flights, hospital admission rates, ESG (environmental, social and gov-

ernance) data, and government contracts, not to mention of course sentiment expressed in the press and on social media, which we develop further in this report.

As alternative data comes from immense databases, machine learning and artificial intelligence are used to process it all.

Figures show that this strategy is developing fast. The number of alternative data providers has increased 20-fold in the past 30 years, states a report from the Alternative Investment Management Associa-

tion (AIMA), estimating nearly 450 currently active providers as opposed to a mere 20 in 1990. In addition, more than three-quarters of investment firms use alternative data, according to Ernst & Young and associates.

A flurry of recent examples confirms this. In April, the Swiss National Bank (SNB) published a paper entitled "Nowcasting economic activity using transaction payments data". In it, the SNB explains how it assesses the value of "high-frequency payments data for nowcasting economic activity". The authors

## One might start to wonder whether investors can legitimately get by without these tools

state, "Focusing on Switzerland, we predict real GDP based on an unprecedented 'complete' set of transaction payments data: a combination of real-time gross settlement payment system data as well as debit and credit card data. Following

a strongly data-driven machine learning approach, we find payments data to bear an accurate and timely signal about economic activity." They then go on to say that "the payment models slightly outperform the benchmark models in times of crisis but are clearly inferior in 'normal' times.... We thus conclude that models based on payments data should become an integral part of policymakers' decision-making."

In January 2023, Spain's central bank (Banco de España) published the working paper "A New Supply Bottlenecks Index

Based on Newspaper Data" on its website. Here, the institution presents a new monthly indicator developed to measure supply bottlenecks using newspaper articles. The authors write, "The supply bottlenecks index (SBI) provides a consistent description of supply issues related to wars, natural disasters, strikes and, most recently, the COVID-19 pandemic."

One might start to wonder whether investors can legitimately get by without these tools. No, says Julien Leegenhoek, founder and CEO of the investment fund Taranis, which specialises in alternative data analysis. He believes that "data will increasingly be the differentiating factor". The Geneva-based company, launched in 2020, is unique in that it uses no economic indicators to decide on the composition of its funds. By taking this approach, the firm is practically a prototype of what finance can do off the beaten track. "We try to capture the collective point of view exclusively through market sentiment analysis and other alternative non-financial data," Leegenhoek says. It's about applying crowd psychology to investment."

Academic experts are puzzled as to what to do with this extreme approach. "We'll have to see over the long term," Amit Goyal, professor of finance at the University of Lausanne, suggests politely, "but I have my doubts that this type of strategy will always be relevant." That said, the initial results are promising. In early October, the company's website proudly announced that the Taranis Market Sentiment fund had been nominated for the HFM European Performance Awards 2023 for the third consecutive year. ▲



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## PFAS

# The problem with forever chemicals

**PFAS chemicals are presumed to be harmful to health. As they are extremely resistant to natural degradation, they build up in the environment. Stricter laws in Europe and the United States should benefit companies with the capability to detect and treat these compounds. We take a closer look...** BY BERTRAND BEAUTÉ

→ DuPont's chemical plant in Parkersburg, which produces Teflon, has been responsible for extensive PFAS contamination of the environment. This story, told in the movie *Dark Waters*, is the basis for the first lawsuit against the producers of these perennial pollutants.

© BRIAN SCHUTTMAN, NEW YORK TIMES

# S

ome films mark us. Deeply. *Dark Waters* is one of them. Released in cinemas in 2019, the film tells the true story of the American attorney Robert Bilott, who sued chemical giant DuPont in the late 1990s for contaminating the water supply of an entire region in West Virginia. The culprit in this public health scandal is PFOA, or perfluorooctanoic acid, which was long used to make Teflon frying pans.

This chemical is extraordinarily persistent in the environment

and harmful to human health, suspected to be carcinogenic and linked to other health problems (see infographic). It was eventually banned in the European Union in July 2020 and in Switzerland a year later. So that means it's over, right? Sadly, no. *Dark Waters* ends with a disturbing message. PFOA may now be regulated, but hundreds – in fact thousands – of man-made chemicals are circulating freely in nature. And the truth is, no one is quite sure what their effects are on the environment or our health.

PFOA is in fact one of a large group of chemicals known as PFAS (per- and polyfluoroalkylated substances). First discovered in the 1930s, these compounds were introduced on the market after World War II. Their non-stick, water-repellent properties and resistance to high heat have made them the chemicals of choice in a wide range of industrial sectors. They are found in textiles, food packaging, fire-fighting foams,

non-stick coatings, cosmetics, electronic chips, ski wax and even toilet paper. "PFAS are ubiquitous in our daily lives," says Nathalie Chèvre, an ecotoxicologist with the Faculty of Geosciences and Environment at the University of Lausanne. The OECD estimates that the PFAS family includes more than 4,700 different substances, but the US Environmental Protection Agency (EPA) puts the figure at more than 12,000.

"PFAS have a chain of carbon atoms that are bonded to fluorine atoms," Nathalie Chèvre adds. "Carbon-fluorine bonds are some of the strongest in organic chemistry." In other words, "Sort of like plastics, PFAS degrade very slowly or not at all when released into the environment," says Arnaud Bisschop, senior portfolio manager specialising in water-related investments at Thematics Asset Management. "They gradually build up, which has earned them the regrettable nickname of forever chemicals." →





↑ Robert Bilott, the lawyer who sued DuPont for poisoning West Virginia's water with PFAS. His long fight is recounted in an article published in the *New York Times* in 2016: "The lawyer who became DuPont's worst nightmare". The film *Dark Waters* is directly inspired by this article.

In February 2023, the “Forever Pollution Project”, a collaborative survey, publicly revealed the extent of contamination from these pollutants in Europe. Nearly 17,000 sites contaminated by PFAS have been detected in Europe, including 2,100 “hotspots”, where concentrations are higher than 100 nanograms per litre (ng/L). Experts consider those levels hazardous to human health. Switzerland has not been spared. More than 300 sites in our country are believed to be contaminated; 134 of them have reached alarming levels. “But pollution is not limited to the places revealed by the Forever Pollution Project survey,” points out ecotoxicologist Nathalie Chèvre. “It affects the whole population, because PFAS are everywhere. They have contaminated all ecosystems, soils, rivers and lakes, groundwater and even very remote regions that we would have thought untouched, such as the Himalayas or, in Switzerland, the snow at Evolène or La Brevine.”

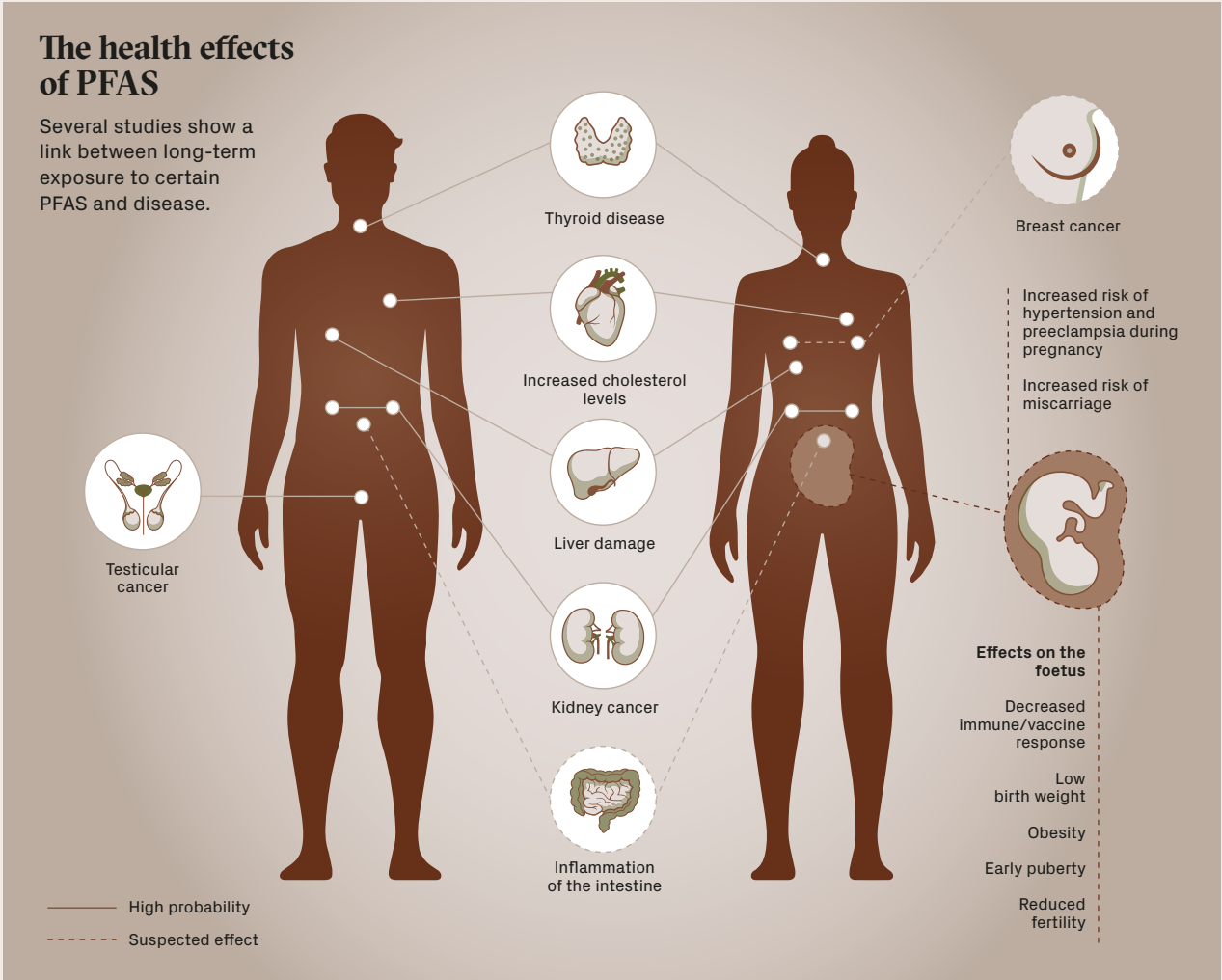
As a result of environmental pollution, many foods – particularly eggs, fish and shellfish, as well as fruit and vegetables – contain PFAS. Published in August 2023, a study conducted by the US Geological Survey also showed that PFAS were present in the water in 45% of the country’s tap water. “It is believed that every citizen, including in Switzerland, has PFAS in their bodies,” Chèvre says. The main source of contamination is through our food.

“Sort of like plastics, PFAS degrade very slowly or not at all when released into the environment”

Arnaud Bisschop, senior portfolio manager at Thematics Asset Management

Published in August 2023 by the Swiss Confederation, the initial findings of the Swiss study on human biomonitoring confirm this fear. Scientists measured the presence of 30 PFAS in the blood of 700 Swiss citizens. The result: 100% of the participants had forever chemicals in their blood, in particular PFOS and PFOA. These substances have been banned in Switzerland since 2011 and 2021 respectively. “The concentrations of PFAS measured in this study were comparable to those found in similar studies conducted in Europe

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SOURCE: EUROPEAN ENVIRONMENT AGENCY

and Canada,” the Swiss government said. This is proof that the problem is global.

Switzerland’s Federal Food Safety and Veterinary Office (FSVO) notes that while a number of harmful effects on health have been established for certain PFAS (PFOA and PFOS, in particular), there are still considerable gaps in our knowledge about many of these substances. Nathalie Chèvre agrees, “It’s very difficult to assess the impact of all these chemicals on health, and it has to be said that not much is known today about the health effects of most PFAS.”

Studies conducted mainly on animals show that they raise cholesterol levels, are highly correlated with testicular and kidney cancer, and affect fertility and foetal development. They →

FOUR COMPANIES THAT STAND TO BENEFIT FROM PFAS

XYLEM

The water expert

In January 2023, the US group Xylem – world leader in water solutions and technologies – announced that it had bought Evoqua for

\$7.5 billion. This acquisition positions Xylem as an expert in treating water sources for PFAS. Evoqua provides solutions for removing

PFAS from public water systems. Most analysts recommend buying Xylem shares, which could benefit from the stricter laws on ac-

ceptable PFAS levels in public drinking water.

FOUNDED: 2011  
HEADQUARTERS: WASHINGTON (US)  
EMPLOYEES: 18,000  
2022 REVENUE: \$5.5 BILLION  
→ XYL

EUROFINS

The European laboratory

Tougher laws on PFAS will have a direct effect: many more tests will be needed in the future to detect these toxic compounds in water

and food. For example, current testing detects concentrations of only three PFAS in Swiss tap water. By 2026, testing will have to

cover 20 substances. Eurofins is the European champion of companies capable of detecting these chemicals, with 900 laboratories in

some 60 countries and 450 million tests performed every year. Most analysts recommend holding shares.

FOUNDED: 1987  
HEADQUARTERS: LUXEMBOURG (LU)  
EMPLOYEES: 62,000  
2022 REVENUE: €6.7 BILLION  
→ ERF



PFAS in our everyday lives



Waterproof clothes



Paint



Cosmetics and personal care products



Pesticide



Stain-resistant furniture



Fast food packaging



Non-stick kitchen utensils



Firefighting foam

are also suspected of interfering with the endocrine (thyroid) and immune systems (see infographic on p. 41). A 2019 study by the Nordic Council of Ministers estimated annual health-related costs due to diseases caused by PFAS at between €52 billion and €84 billion in Europe. Researchers believe these costs are underestimated, as the study covered only a limited range of health effects (high cholesterol, decreased immune system and cancers) linked to exposure to a few specific PFAS.

“These molecules are essential to the manufacture of many products. If you eliminate PFAS, for example, you no longer have semiconductors”

Arnaud Bisschop, senior portfolio manager at Thematics Asset Management

In response to this threat, governments are taking steps towards stricter legislation. For example, in February 2023, the European Chemicals Agency published a proposal to ban all these ultra-toxic chemicals due to their extreme persistence in the environment. A joint statement from the five nations that initiated the proposal – Germany, the Netherlands, Denmark, Sweden and Norway – stated that it paves the way for “one of the largest chemical bans ever imposed in Europe”.

The draft ban is expected to be submitted by the European Commission to Member States by 2025. This is bad news for PFAS manufacturers. The leading ones are the US chemical giants DuPont and 3M, which are already ensnared in lawsuits over contamination caused by the factories that produce these



↑ Wilbur Tennant's farm in Pakersburg, West Virginia. This farmer lost nearly 200 cows due to the DuPont factory that was releasing PFAS into the river. His story, told in the film *Dark Waters*, helped reveal to the world the secret of “forever chemicals”.

chemicals (see inset on p. 44).

But doing without PFAS will by no means be simple. “These molecules are essential to the manufacture of many products,” says Arnaud Bisschop of Thematics Asset

Management. “If you eliminate PFAS, for example, you no longer have semiconductors.” Could substitutes be found? “Throughout history, replacing a problematic chemical with a substitute has, to my knowledge, never brought any benefit. At best, it was the same, and at worst, the new substance had

even more problems,” Nathalie Chèvre says. “The right solution would be to limit the use of PFAS to uses that are essential to society. For example, the firefighting foam used by firefighters, which contains PFAS, can be considered an absolutely necessary product because we really need to put out fires. →

CLEAN HARBORS  
The PFAS incinerator

Once removed from the water, how do you get rid of PFAS? Clean Harbors, a specialist in hazardous waste treatment, has developed an inciner-

ation process which, according to a company study published in 2021, is capable of destroying 99.99% of PFAS. In August 2023,

Clean Harbors CEO Michael Battles said he expects sharp growth in its PFAS business, particularly from 2024 onwards, once the

guidelines for the treatment of these materials had been updated in the United States.

FOUNDED: 1980  
HEADQUARTERS: NORWELL (US)  
EMPLOYEES: 20,000  
2022 REVENUE: \$5.167 BILLION  
→ CLH

KURARAY  
The decontaminator

The Japanese conglomerate Kuraray acquired the US company Calgon Carbon in 2018. Calgon Carbon develops a technology that uses

activated carbons to remove PFAS from water systems. This technology should benefit from the decreased legal limits

for these chemicals in drinking water.

FOUNDED: 1926  
HEADQUARTERS: TOKYO (JP)  
EMPLOYEES: 11,000  
2022 REVENUE: ¥ 756.4 BILLION  
→ 3405



However, we don't need to wear textiles soaked in PFAS, such as Gore-Tex, or have PFAS in toilet paper."

To reduce health risks, governments now plan to limit public exposure to these contaminants. In June 2022, the US EPA set new guidelines that would significantly reduce advisories for PFOA and PFOS in drinking water from 70 nanograms per litre to 0,004 ng/L and 0,02 ng/L respectively. Switzerland and the European Union are also moving in this direction. Currently, only three PFAS are tested in Swiss drinking water (PFOA, PFOS and PFHxS), with a maximum acceptable concentration of 0.3 microgrammes per litre (µg/L) for PFOS and PFHxS, and 0.5µg/L for PFOA. However, the Swiss FSVO is

currently revising these limits, to align them with standards in the recast EU Drinking Water Directive. By 2026, the maximum concentration in drinking water should be reduced to 0.1 µg/L for the sum of 20 PFAS.

**"The existing technologies used to clean up the environment are prohibitively expensive"**

Nathalie Chèvre, ecotoxicologist with the Faculty of Geosciences and Environment at the University of Lausanne

**Investment opportunities**

In an article published in March 2023, the asset management company Aviva Investors wrote: "There are now opportu-

nities linked to removing PFAS, one which relates to water, particularly given the new legal limits proposed by the EPA in March 2023." Arnaud Bisschop shares this view, "Tougher legislation will, for example, push municipalities and water management companies to assess and measure current PFAS pollution. Companies that have the expertise and special measuring equipment required to conduct this type of test or that are developing technology to capture PFAS will see major growth opportunities. Water analysis and treatment are big markets for the future."

Obviously, some major players in water and waste treatment, such as the French company Veolia, will benefit from this new business without it having

a significant impact on their bottom line. But other, smaller and more specialised companies, such as the US water treatment specialist Xylem (see p. 40), could see their revenues soar as anti-PFAS legislation is enacted.

Techniques exist, such as activated carbon filters, to capture PFAS. But things are not so simple. "Once the PFAS have been removed, treating the toxic waste produced remains a huge challenge," Arnaud Bisschop says. Another hurdle is that "the existing technologies used to clean up the environment are prohibitively expensive," says Nathalie Chèvre. PFAS are likely to exact a heavy cost on society and remain an issue. Forever chemicals, forever a problem. ▲



↑ In a residential area of The Hague (the Netherlands), a concentration of PFAS of between 9.5 and 13 nanograms per litre (ng/L) was measured in groundwater. According to European standards, the concentration should not exceed 0.65 ng/L.



On 4 September, 2023, lawyer Bénédicte Ficq went to the Palace of Justice in Amsterdam to file a class action lawsuit on behalf of 2,700 people against Chemours. The company is accused of "intentionally and illegally" polluting soil, air and surface water with PFAS around its plant in Dordrecht, the Netherlands.

**Onslaught of lawsuits**

**The major PFAS producers, such as DuPont and 3M, are currently embroiled in landmark legal battles.**

Since the trial portrayed in the film *Dark Waters*, multiple lawsuits have been filed against the chemical giants (3M, DuPont de Nemours, Chemours, Corteva). They are accused of causing PFAS-related environmental and drinking water contamination from their production plants. An article by Aviva Investors published in 2023 reported that more than 6,400 complaints have been lodged since 2005. "We identified PFAS as a key risk for 3M quite early," Max Burns, global equities portfolio manager & head of Equity Research

at Aviva Investors, says in the article. "We called it out because the liability attached to legacy PFAS and forever chemical production by 3M isn't quantifiable."

In June 2023, the 3M group reached an agreement to pay \$10.3 billion to settle lawsuits filed in the United States for PFAS contamination of drinking water. The settlement, subject to court approval, sets out payment over 13 years between 2024 and 2036, according to an SEC report. The money is to be used to fund treatment technologies for public water systems that have tested positive for PFAS, either in the past or in the future, and to pay for future testing. In the same month, three other groups (Chemours, DuPont de Nemours and Corteva) announced similar settlements. They will pay nearly \$1.2 billion (\$592 million for Chemours, \$400 million for DuPont de Nemours and \$193 million for

Corteva) to avoid prosecution for PFAS contamination of drinking water across the United States. Other trials are underway, notably in the Netherlands and Belgium.

The situation is all the more critical because these chemical groups have known about the dangers of certain PFAS for years. Researchers from the University of California San Francisco and University of Colorado examined internal documents from DuPont and 3M, the biggest producers of PFAS. Published in June 2023 in the scientific journal *Annals of Global Health*, their findings are overwhelming. They show that the two companies "knew PFAS were 'highly toxic when inhaled and moderately toxic when ingested' by 1970, forty years before the public health community". But instead of halting production, they preferred to cover up their information, to the detriment of human health and

the environment. Due to pressure from investors, combined with litigation and reputational risks, as well as tougher legislation in both Europe and the United States, the chemical company 3M announced in December 2022 that it would completely remove PFAS from its products by the end of 2025.

Other chemical groups have phased out long-chain PFAS, i.e., those with eight carbon atoms such as PFOS and PFOA, in favour of short-chain PFAS (six carbon atoms or less). The short-chain compounds are believed to be less toxic than long-chain PFAS. However, the Swiss Federal Office for the Environment warns that, "because of their extreme persistency in the environment and high mobility in soils and waters, there is concern that also shorter-chain perfluorocarboxylic acids could be problematic for the environment and human health in the long term."



→

Following the publication of the Hindenburg Research report, accusing the Indian group Adani of fraud, activists demonstrate and burn effigies of Indian Prime Minister Narendra Modi and the company's CEO Gautam Adani, on 6 February, 2023 in Kolkata, in India.

## SHORT SELLING

# Fraud hunters

Short-selling research firms conduct lengthy investigations into listed companies. Their goal is to uncover instances of fraud and drive down the company's share price. And hopefully win very big. BY BERTRAND BEAUTÉ

# I

t's the latest master stroke by short sellers. The 100-page report published on 24 January 2023 about the Indian conglomerate Adani by the New York firm Hindenburg Research triggered upheaval in New Delhi and sent the stock markets reeling. In fact, the title says it all. Starting with "Adani Group: How The World's 3<sup>rd</sup> Richest Man Is Pulling The Largest Con In Corporate History", the Hindenburg Research report accuses the company's CEO, Gautam Adani, of accounting fraud and stock manipulation via a network of shell companies. →





Seen from Switzerland and the rest of the West, the case simply looks like a situation of financial wrongdoing. But in India, Adani is huge. The conglomerate has more than 25,000 employees. Owner of ports and airports, the giant is active in electricity production and distribution, coal mining, cement manufacturing and 5G. Until then, the company's success had been reflected on the stock market. Between 1 January 2020 and 1 January 2023, the share price of Adani Enterprises sky-rocketed by more than 1,700%, making Gautam Adani the richest man in India and the third richest in the world (\$83 billion in 2023 according to Forbes).

## Muddy Waters makes no secret about the fact that it has some big names on its payroll, including former CIA officers

Bearing that in mind, the Hindenburg Research report hit like a bombshell. The firm lost \$100 billion in market capitalisation in less than a week, and Adani's personal fortune plummeted by several tens of billions of dollars, pushing the Indian tycoon past twentieth place in Forbes' ranking of the world's wealthiest people in real time, with \$53.3 billion as at 9 October 2023.

The affair has spilt over into politics. As Gautam Adani is close to Prime Minister Narendra Modi, billionaire George Soros said in February that Modi "will have to answer questions from

foreign investors and in parliament" because he "and business tycoon Adani are close allies; their fate is intertwined".

How did a research firm with a dozen employees manage to topple a giant like Adani and even an entire government? At the beginning of the report, Hindenburg Research explains that it took two years of investigation to tackle the star company on the Bombay Stock Exchange. This is not the firm's first time at it. For example, in September 2020, Hindenburg Research published a scathing report on Nikola Motors, the US manufacturer of hydrogen-powered trucks, accusing it of an "intricate fraud built on dozens of lies". As a result, Nikola, often heralded at the time as the Tesla of hydrogen, tumbled on the markets, stayed low for a long time and has never recovered since. From a high of over \$65 in June 2020, the share is now trading at around \$1.5. Enough said.

Hindenburg Research is what is known in the financial world as an activist short seller, i.e. an investment fund that bets that a company's share price will fall, the opposite of what most investors do (see inset below). In other words, the harder a company collapses, the richer Hindenburg gets. The company's name was not chosen by chance. Hindenburg refers to the blimp that exploded mid-air over New Jersey in May 1937. Like the famous German airship, the research firm's aim is to blow up companies that have risen too high in mid-flight. And then make substantial profits from it. To bring Hindenburg towards that goal, anything goes, including writing, publishing and publicising vitriolic reports. Hindenburg is not the only firm following this model. The most well-known short sellers include Muddy Waters Research, Citron Research, Glaucus, Spruce Point Capital and Gotham City. Their achieve-

### The risky game of short selling

Short selling is not just for experts. Any investor can do it. It involves selling a stock market asset that you do not own, but have simply leased, in the hope that its price will fall. Let's say you're convinced that a share is going to crash on the stock market in the next few weeks. You borrow the stock, which is worth 100 Swiss francs, and sell it immediately. A few days later, the share actually collapses, falling to 50 Swiss francs. You buy the stock and return it to the institution from which you borrowed it. Profit: 50 francs, minus the leasing fees. That is how speculation on falling share prices works. It is a common practice used especially by hedge funds. But it's a high-risk game. If, instead of collapsing, the target share takes off, the

short seller still has to buy the stock back at the market price. The losses are theoretically unlimited. In 2021, the activist fund Citron Research published information on GameStop, betting that the gaming retailer would decline. But it was not to be. Backed by a cohort of investors, the stock soared, forcing hedge funds to sell their positions in a hurry (short squeeze) and at a high price. Following this setback, Citron Research announced that it would no longer publish analyses on short selling. According to S3 Partners, short selling is a losing strategy over the long term. Between 2019 and 2021, short sellers of US equities lost a total of \$571.8 billion. However, in 2022, they made gains of \$300.1 billion.

© NIKOLA



ments have wreaked havoc in Europe, including the Wirecard financial scandal in Germany, the collapse of Spanish internet company Gowex and the descent into hell of French retail giant Casino.

"To make money, short sellers need to convince other investors in order to drive share prices down," says Mathieu Gosselin, financial services partner at Bartle. "Markets operate on trust. The reports aim to break that confidence and cause a stock to fall." But sometimes that doesn't work. "What's crazy is when you find a fraud and Wall Street doesn't care. That happens,"

laments Andrew Left of Citron Research, on the website Seeking Alpha.

To prevent that kind of apathy, which can be very costly (see inset), short sellers do not hesitate to share their opinions on social media such as X (formerly Twitter), post their studies free of charge on their website and call on reporters, knowing full well that a shrewdly placed article can change everything. "We make sure the market knows what we know," said Muddy Waters founder Carson Block in an interview with Pensions & Investments in October 2022.

↑ In 2020, Hindenburg Research accused hydrogen-powered truck manufacturer Nikola of lying about the progress of its technology, effectively misleading investors. These accusations led Trevor Milton, CEO and founder of Nikola, to resign and then go to court where he was convicted of fraud in 2022.

### White knights that are not so white

To reveal their precious information, activist short sellers make full use of their address books, former police officers and pros-

ecutors. For example, Muddy Waters makes no secret about the fact that it has some big names on its payroll, including former CIA officers. They also use cutting-edge technologies, such as satellite imagery. But naturally, taking on major groups to expose fraud and embezzlement causes some ripples, especially when their →





work sends bosses to prison, like former Nikola CEO Trevor Milton, who is facing 25 years in prison, or Markus Braun, former CEO of Wirecard, who has been behind bars since June 2020. “Short sellers get negative press,” says Mathieu Gosselin. “They’re often accused of getting rich by destroying entrepreneurs and businesses.”

## “Doing the work Wall Street won’t”

Short seller **Muddy Waters** proclaims on its homepage

For example, Richard Fuld, the boss of Lehman Brothers in 2008, seethed that his bank had been “attacked” by short sellers. In 2020, the law firm Wachtell, Lipton, Rosen & Katz, whose clients include big-name

↑ Short seller Citron Research denounced the fraudulent practices of Chinese real estate developer Evergrande in 2012. Ten years later, the group is in dire straits, weighed down by an abysmal debt. Here an Evergrande construction site in Hangzhou, pictured in August 2023.

corporations such as Twitter, launched a petition calling for tighter regulations on short selling. In it, the firm criticised: “third parties seek to profit by driving a company’s

stock price down or promoting negative, and at times manipulatively misleading, rumors and misinformation”. In May 2023, Wachtell reiterated its criticism in a letter to clients calling on the Securities and Exchange Commission (SEC) to regulate what it calls “coordinated short attacks”.

On the other side, short sellers say they are working for the good of all investors. “Doing the work Wall Street won’t,” short seller Muddy Waters proclaims on its homepage, in the belief that traditional financial analysts don’t have

the tools and training to spot fraud. So, are short sellers the white knights of finance? “Short sellers are not philanthropists. Unlike whistleblowers, who in some cases act for ethical reasons, these hedge funds have only one aim: to monetise their information as much as possible,” Mathieu Gosselin says. “However, not to play the devil’s advocate, but if a company manipulates its accounts or commits fraud in any way whatsoever, I think it’s positive that the community should be informed. Short sellers have a place and a role to play in the world of finance.” Indeed, many major financial scandals – from Enron to the subprime crisis – have been revealed by short sellers.

But always with the same goal. “The goal with activist short selling is to generate returns,” says Carson Block, founder of Muddy Waters, in an interview with Pensions & Investments. But isn’t the appeal of profit likely to drive short sellers to oversell their information, or even to invent it, to ensure that prices fall? “Short-selling practices are increasingly regulated,” Mathieu Gosselin says. “If the information published in a report is not substantiated, that’s price manipulation. That practice sends you straight to court.”

In fact, while short sellers are regularly sued after publishing a report, very few have been found guilty of wrongdoing. A rare exception was in 2019, when Andrew Left of Citron Research was convicted in Hong Kong of presenting false information for denouncing the excessive debt of Chinese property developer Evergrande in a report. A few years later, it finally emerged that the activist was telling the truth. ▲

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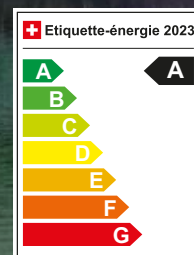
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FOOD

# Make *whey* for synthetic milk!

After a decade of experimentation, dairy products made in a laboratory are ready for commercial sale. Nestlé is about to launch several of them to market.

BY JULIE ZAUGG



S

ometimes a simple bite of food can change your life. For Ryan Pandya, it came in the form of a cream cheese bagel. A vegetarian, the chemistry and bioengineering student at Tufts University, near Boston, had decided to eat the vegan version of cream cheese. But as soon as he bit into it, he was horrified. The taste and texture of the dairy substitute were so bad that he vowed to do better. And in 2014, Ryan Pandya founded Perfect Day, a company that produces a lab-grown whey protein to replace dairy in food.

Less than a decade later, the little startup partnered with food giant Nestlé in 2022 to develop a dairy beverage made with its whey protein at the Swiss group's new R&D Accelerator in Ohio. Under the brand name Cowabunga, the animal-free product is available in two flavours, original and chocolate. "It's currently being sold on a trial basis in select Safeway supermarket locations in the United States," says Paul Vraciu, head of Commercial at Perfect Day.

Approved by the US FDA in 2019, Perfect Day's whey protein replaces dairy in ice cream from the brands Brave Robot, Nick's and Coolhaus, in a Mars chocolate bar, and in a cream cheese spread from Bel Group. This animal-free alternative also appears in yoghurt, protein powders and cake mix.

**"The proteins produced in the laboratory have the same taste, texture, properties and nutritional profile as those that come from cows"**

Paul Vraciu, head of Commercial at Perfect Day

"To make whey protein, we use a process called 'precision fermentation'," Paul Vraciu explains. "The technology has been around for decades, but we've adapted it to our needs."

The method has long been used to produce insulin, citric acid, amino acids and vitamin B12, and to replace natural rennet to make cheese. How it works: a genetic sequence is given to a microorganism, which may be a yeast, a fungus or a bacterium from the microbiome. "The microorganism is then programmed to produce the proteins contained in milk, such as whey or casein," says

Carlotte Lucas, from the think tank Good Food Institute. "The microorganisms are then fed sugars so that they multiply and produce more."

The resulting dairy proteins are exactly the same as the proteins that come from cows. "They have the same taste, the same texture, the same properties and the same nutritional profile," Paul Vraciu says. But they have a smaller environmental footprint. "You save on the land, water and energy that are normally taken up to raise animals," says David Kaplan, a



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← A Perfect Day employee pictured at the company's bioanalytical lab in Berkeley in March 2023.

professor of biomedical engineering at Tufts University. The dairy industry is estimated to account for 3% to 4% of greenhouse gas emissions worldwide, mainly through the methane produced by cattle.

poking around in animal-free dairy. In 2022, for example, Unilever announced its plans to launch a Ben & Jerry's ice cream made with lab-grown proteins.

"These large groups want to safeguard themselves against

rising costs due to the declining availability of certain resources, such as farmland and water," says Lisa Feria, founder of the venture capital firm Stray Dog Capital, which has invested in the field. "They also need to find ways of honouring their commitments

**"If lab-grown meat and dairy products are to become a real source of food, capable of feeding a significant proportion of the human population, their cost will have to come down drastically"**

David Kaplan, a professor of biomedical engineering at Tufts University

Another advantage of lab-grown dairy proteins is that they contain no lactose, which is good news for the lactose intolerant. In addition, as they are not produced by farm animals, they do not contain any antibiotics, growth hormones or pesticides, all of which are commonly found in industrial milk.

Perfect Day is a pioneer, but since its creation some 30 startups have sprung up to produce lab milk, including Better Dairy in the UK, Formo in Germany, Remilk in Israel and New Culture and Change Foods in the United States. Two US companies, Turtle Tree and Biomilk, have even begun testing precision fermentation to produce breast milk.

As for multinationals, "Nestlé is ahead of the competition," Carlotte Lucas says. But Unilever, Danone, General Mills and Starbucks have all started

to reduce CO<sub>2</sub> emissions."

However, the lab-grown dairy industry still faces a number of hurdles before it can supplant cattle. Such a product's success will depend on consumer acceptance, as well as price. "If lab-grown meat and dairy products are to become a real source of food, capable of feeding a significant proportion of the human population, their cost will have to come down drastically," David Kaplan says. A 30-litre precision fermentation tank currently costs 167,000 Swiss francs. Comparatively, a cow producing the same amount of milk in a single day costs 1,800 Swiss francs.

The solution will come from economies of scale once production has reached an industrial threshold, Lisa Feria of Stray Dog Capital says. Perfect Day already operates two sites, one in Bangalore and the other in Salt Lake City. ▲





R E A D

### The Coming Wave

Technology, Power, and the 21<sup>st</sup> Century's Greatest Dilemma

BY MUSTAFA SULEYMAN,  
WITH MICHAEL BHASKAR  
CROWN, 2023

*The Coming Wave* is today's must-read on artificial intelligence and the challenges it will bring in the years to come. The author, Mustafa Suleyman, is a leading AI expert and co-founder of the pioneering AI company DeepMind, which was acquired by Google in 2014. In this book, he shows how new AI-driven technologies will create immense prosperity but also threaten the nation-state due to invasive surveillance. The essential challenge of the coming decade, he argues, will be to maintain control over powerful technologies, which he calls the "containment problem".

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L I S T E N

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F O L L O W

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Earnings Whispers has been providing company sales forecasts since 1998. Its X (formerly Twitter) feed is an effective channel for staying informed of earnings releases. The account posts detailed weekly calendars with the most relevant earnings reports on the markets.



D O W N L O A D

### Do It Now

RPG To-Do List  
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At first glance, Do It Now looks like just another productivity app. Nevertheless, it does a good job of making everyday tasks feel more rewarding. The app features a virtual hero who earns experience points and gains new skills, hence the RPG (Role Playing Game) acronym in its name. To level up, all you have to do is go to work, do the washing or simply read a book!

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# Technics

A B R A N D  
A S T O R Y

## The legendary turntable

Highly revered in DJ history, the Technics SL-1200 turntable was released in 1972 and revolutionised the music world, leading to the rise of hip hop. Read on to learn more.

BY STANISLAS CAVALIER

V

ery few hi-fi devices are responsible for the birth of a new musical genre, never mind an entire cultural movement. But there's no doubt that the legendary Technics SL-1200 turntable belongs to this exclusive category. To understand its story, we need to travel back to the 1960s. That's when the Japanese company Matsushita, which would later become Panasonic, created Technics, which specialised in the brand's high-end speakers and amplifiers.

At Technics, an engineer named Shuichi Obata was working on developing vinyl turntables. At that time, every model available on the market used a belt to spin records – not ideal for intense use. Radio stations in particular had to change their turntable belts regularly so that they didn't break while live on air.

Thanks to Shuichi Obata, in 1970 Technics released the SP-10, the world's first direct-drive vinyl record player. A true work of art that earned its place in the Museum of Modern Art (MoMA) in New York, the SP-10 doesn't have a belt – its motor is directly attached to the turntable.

This model quickly became very popular in the radio world and recording studios, and as a result Technics released versions for the general public: the SL-1100 in 1971 and the SL-1200 in 1972.

Designed as a hi-fi record player for living rooms, the SL-1200 would in fact go on to be wildly successful in very different settings

Designed as a hi-fi record player for living rooms, the SL-1200 would in fact go on to be wild-

The Technics SL-1200 is “the Mercedes Benz of turntables”, because it could withstand anything

Grand Wizzard Theodore, New York DJ and inventor of the scratch

hop, including DJ Kool Herc, Grand Wizzard Theodore and Grandmaster Flash. These artists used the SL-1200's direct drive and its other features, such as its two small potentiometers, which can vary the pitch from -8 to +8, to invent new sounds – including the scratch – which would later become the cornerstones

of hip hop. While first designed as audio equipment, the SL-1200 became a musical instrument in its own right.

Shuichi Obata welcomed this evolution, meeting with DJs to understand their specific requirements. When he returned to Japan, the engineer developed a new version of the record player, the SL-1200 MK2, which was released in 1979. Designed specifically for DJs, this version was equipped with a pitch control slider that was easier to handle and a new quartz-controlled motor. The new motor made pitch control extremely precise: when the record is stopped by hand, the motor returns to its playback speed almost instantly once the record is released.

The MK2 was also sturdier and more durable so it could be transported as well as resist knocks, bumps and spilled drinks in clubs. For New York DJ Grand Wizzard Theodore, the inventor of the scratch, the Technics SL-1200 is “the Mercedes Benz of turntables”, because it could withstand anything.

In the early 1980s, the MK2 became the turntable of choice for DJs and clubs. It spawned other versions such as the MK3 in 1989 and the MK5 in 2000. In total, more than 3.5 million SL-1200 models were sold worldwide between 1972 and 2010. In 2010, when vinyl was surpassed by CDs and MP3s, Panasonic stopped production of SL-1200 record players. In the years following, the price of used models skyrocketed. When vinyl became popular again, Panasonic restarted production of its legendary record player, launching the SL-1200G in 2016, followed in subsequent years by models such as the SL-1200 MK7. But the models produced from 1972 to 2010 remain extremely popular: expect to pay about 500 Swiss francs for an original SL-1200 MK2. ▲

### KEY DATES

**1965**  
The Technics brand is founded in Japan

**1970**  
The SP-10 – the first direct-drive turntable – is released

**1972**  
The first SL-1200 is released, later becoming an essential part of DJ culture

**2010**  
Production stops on Technics turntables

**2016**  
Panasonic relaunches Technics turntables

↑  
A classic with a modern twist. In 2019, Technics launched the MK7, a new edition of its famous SL-1200 turntable released in 1972.

ly successful in very different settings. On a trip to the United States, Shuichi Obata discovered that his invention was adopted by nightclub DJs and the great trailblazers of hip



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# Prius gets sexy

**Without reneging on its environmental commitments, Toyota's iconic saloon car now flaunts an attractive design and a few sporty features.** BY RAPHAËL LEUBA

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Wow, already a quarter of a century old. And five million units produced since 1997. With the clarity of hindsight, we can legitimately consider the Prius to be the emblematic car of the third millennium. You can love it or hate it, but this funny-looking sedan managed to introduce electric hybridisation into the automotive universe. Someone had finally done something to improve the deplorable energy efficiency of combustion engines. What's more, the first generations of the new car went completely against the traditional canons of beauty. They captured that quality of being both cool and uncool at the same time, a sort of Birkenstock for cars, focusing on well-being, especially for the planet.

Truly fuel-efficient and reputedly sustainable, the Prius has also been emulated within the ranks of the automotive industry. Now, all the big carmakers have at least one hybrid, whether it is mild, full or plug-in. So much so that in recent years, despite technical innovations such as a plug-in variant and a three-engine 4x4 version, the emblematic Toyota has fallen into line. It has also been left out of the all-electric wave.

To restore its former lustre, Toyota has designed the fifth generation and given it a healthy dose of style. The compromise has shifted in favour of more excitement, and its traditional fans may not know what to do with it. Low-slung (1.42 m by 4.60 m long)

and aerodynamically tapered like an Air Max sneaker, the new Prius has gained substantial sex appeal. The sculpting of the lower body is worth checking out. Of course, that means a little less space on board. Especially in the rear seats. With a boot size of barely 284 litres, the car is not really cut out to be a taxi. Plus, the extreme inclination of the side pillars significantly impairs visibility, which is saved by the clear image of the approach cameras.

Nonetheless, you feel as comfortable at the wheel as if you were in slippers. The leather is fake (vegan), but the comfort of the ventilated seats is real. The finish is not plush, but inspires confidence, while the modern layout and digital interfaces meet all the usual requirements. Yes, that means you can always turn off the annoying speed limit warning.

Once the car is in motion, you'll feel that proverbially smooth ride and, for the first time, performance that is as energetic as it is exciting. Set on a sturdy body, both in terms of steering and support, the Prius follows the trajectory precisely and its controls provide a good feel. In addition, it has a relatively small turning radius and absorbs road bumps well. Driveability is not infallible, but the kilowatts deliver adequate power for a front-wheel drive vehicle. As smooth as ever, the planetary-type continuously variable transmission now works harmoniously with the internal combustion engine. The 2.0-litre naturally-aspirated engine, which makes for rather pleasant background noise, only occasionally revs up to very high RPMs during rapid acceleration if the drive battery is dead.

Now only available as a plug-in hybrid, the Prius has an EV driving range of 86 km. And that is not an illusion, as we found out on some favourable city-countryside routes between Aargau and Seeland. Once the power has been used up (probably 12 kWh of the

P R I U S

P H E V



advertised 13.6 kWh), the Prius behaves like a top-notch full hybrid, capable of delivering short phases of electric driving in urban environments and then giving a power boost from full stop. Reinforced by its sleek aerodynamic shape (Cx 0.27), limited weight (1,545 to 1,605 kg unladen) and narrow tyres (195 mm wide 19-inch tyres!), the good mechanics achieve optimal frugality. Fuel efficiency is between 4.5 litres and 6 litres per 100 km, according to our readings, depending on whether you take the motorway, the type of driving that eats up the most energy. In these conditions, the 40-litre fuel tank is more than adequate.

The new Prius is still environmentally virtuous but now more attractive than previous iterations. Its unexpected talents are aimed at customers who appreciate good looks and dynamic performance. Priced at under 50,000 Swiss francs, even for the option-packed premium model, including a photovoltaic roof, this illustrious pioneer perfectly honours its contract. This could be the best deal on the market for now, with the added bonus of a 10-year warranty. ▲





# T R A V E L

# COSTA RICA

## A GREEN PARADISE

The beauty of this Central American nation, with its lush vegetation and exotic wildlife, is best experienced through its national parks. We provide a must-see list.

BY BLANDINE GUIGNIER, IN SAN JOSÉ

The La Fortuna waterfall – “fortune” in English – is one of the most impressive waterfalls in all of Costa Rica.

© FABIO FISTAROL / ISTOCK

The first thing we notice coming into San José airport is that everything is green, green, green. Khaki, emerald, lime – all imaginable shades intermingle in Costa Rica’s abundant vegetation. Trees, flowers and plants grow even where nothing should, along motorways or in the shade of a shopping centre. In Switzerland, we are used to seeing these plants – monstera, red ginger, hibiscus – in pots, looking stately in the corner of a flat. Here, vegetation is everywhere, in every nook and cranny, on every mound. Its 30 national parks – as opposed to just one in Switzerland, but which covers a comparable surface area – have earned Costa Rica the title of “Champion of the Earth” from the United Nations. More than 50% of Costa Rica’s land is protected. Now that is something for lovers of unspoilt nature to get excited about.

As we enter Manuel Antonio National Park, about a two and a half hour drive from the airport, the rainforest began to unfurl in all its splendour. After a night of rain (September is in the middle of the rainy season), we set off bright and early to avoid the throngs of tourists, numbering over 350,000

every year. We booked a guide through a local agency to help spot the wildlife, right from the start of the journey: a fer-de-lance viper, the most dangerous in the country, coiled up on the roadside, multicoloured crabs, frogs huddled under leaves, **howler monkeys** perched in the canopy, and even a white-tailed deer. As we approach the ocean, our gaze is quickly drawn to the magnificent cove with the white sandy beach and turquoise waters. “Ticos”, as Costa Ricans are known, often refer to it as one

of the most beautiful beaches in the country, which boasts no less than 300. We then go for a swim and some snorkelling. A trail deep in the mangrove then leads to wooden bridges and, lastly, the exit. To relax for the rest of the day, the hard part was choosing from the multitude of hotels in the area. In the end, we decided on the Tulemar Resort. →





Then, back on the road, we worked our way down the Pacific coast to **Marino Ballena**, one of the most visited national parks in the world. Covering 5,375 hectares of shoreline, the area is best explored by boat. Here again, a competent guide makes all the difference. Out on the sea, you might be lucky enough to spot dolphins, which swim in the area year round, or humpback whales, which migrate through these waters from July to October and from December to April. After letting us snorkel around a bit to admire the coral reefs and other marine life, the guide takes us to the park's beaches. If by chance your guide is from the indigenous Boruca tribe, he will be more than happy to teach you about the ancestral use of plants and fruit for food, healing and dyeing traditional fabrics and masks.



### Atop the volcanoes

Costa Rica's appeal extends far beyond its coastline. And it would be a pity not to explore deep inland. With its mountainous landscapes and cooler temperatures, the country's Central Valley is criss-crossed with treks and trails. Some 30,000 hikers come here to brave the country's highest peak, located in the Cerro Chirripó National Park, every year. It generally takes three days of trekking to fully experience this high-altitude neotropical biotope, gleaming with glacial lakes and high mountain meadows. You might even spot one of the emblems of Central America, **the emerald-green quetzal bird**, either in this reserve or in the nearby Los Quetzales National Park, located not far from San Gerardo de Dota. Around this village, the cloud forests are the habitat for some 300 other species of birds, including hummingbirds and trogons. The trees are also majestic here, in and of themselves a whole microcosm of vegetation – with mosses, orchids, ferns – giving the misty undergrowth a mysterious aura. The region is also a hub for coffee production and organic farming, which you can learn more about at Al Mercat Dota.



© CARLOS VALVERDE FONSECA / GETTY IMAGES / SOPHIE LAURENT

Your trip to Costa Rica would not be complete without exploring a volcano or two. If you want to catch a glimpse of the turquoise lagoon in **the Poás crater**, it is wise to wake up early before the clouds cover it. To get there, day trips from San José are available via a road through coffee plantations before winding through valleys reminiscent of Switzerland, full of flowers, farms and dairy cows. Small restaurants, called “sodas”, line the sides of the road, serving typical, inexpensive breakfasts, including Costa Rica's traditional dish of rice and beans, *gallo pinto* (meaning spotted rooster). You will not want to miss climbing Irazú, the country's highest volcano with five craters. At the summit, 3,432-metres-high, the rocky landscape offers a breathtaking view of the Central Valley and, on a clear day, both of the country's coastlines. Like its neighbour Turrialba, you can reach this volcano directly from the capital or from the Caribbean coast. →



### GETTING THERE

Direct flights with Edelweiss three or four times a week between Zurich and San José.

### WHERE TO STAY

#### Arenal Observatory Lodge & Trails

This is the only hotel located in Arenal Volcano National Park. Offering three-star service, it has a unique view of the Arenal volcano and several walking trails. Its bar-restaurant also boasts amazing views of the lake and forest birds, with delicious cuisine made from local produce.

#### Tortuga Lodge & Gardens

Located on a small island, this accommodation offers four-star rooms in a Caribbean-style setting. The restaurant's Greek chef also draws his inspiration from the Caribbean, focusing menus on seafood, coconut milk and root vegetables.

#### Tulemar Resort

With a private beach, four swimming pools, a spa and multiple views over the bay, this luxury hotel is designed for relaxation. The premium villas even come with private jacuzzis, and you can book a chef to come and cook for you.

### WHERE TO DINE OUT

#### Amor loco

The Arenal region features one of only two Relais & Châteaux establishments in the country. The Nayara Springs spa hotel also has a gourmet restaurant called Amor Loco. Alsatian chef William Weiss presents a seven-course menu with French and Japanese flavours, using the finest Costa Rican ingredients.

#### Al Mercat Dota

Perched at 1,900 metres in elevation, Al Mercat Dota restaurant will delight slow foodies. Chef José González has settled in this agricultural region to offer dishes such as trout ceviche, braised pork with squash and chocolate-coffee-caramel panna cotta. You can also spend the night here at one of the rustic lodges in the heart of the mountains.



Located to the north of San José, the winding road from the capital to **the Arenal Volcano** region is equally picturesque, with views of coffee plantations and the jungle. The conical shape of this 1,720-metre-high mountain formation makes an immediate impression. It almost feels as if you are looking at Mount Fuji. Unfortunately, the volcano is still active, so it is prohibited to climb to the crater. But in the national park you can see the most recent lava flow, dating back to 1992. If you still want to enjoy the breathtaking scenery, you can stay at the Arenal Observatory Lodge. The neighbouring town of La Fortuna also boasts some lovely thermal springs. You can get a day pass there or stay on site, for example at the luxurious Nayara Springs, featuring the gourmet restaurant, Amor Loco.



### Slow tourism in the Caribbean

On the Caribbean coast, the villages and their colourful houses, the spicy cuisine and variety of exotic fruits are perfect for slow tourism enthusiasts. The region boasts two national parks with remarkable biodiversity. In **Cahuita**, we are greeted by howler monkeys in their intensely hoarse, low-pitched cries. The magnificent beach gives us plenty of time to relax in the shade of a tree, which – how lucky! – is home to a mother sloth and her baby. Iguanas and eyelash vipers also lurk on either side of the trail.

We take a boat to the park and village of Tortuguero, nicknamed the “Little

Amazon”. And we also take a canoe to the Tortuga Lodge & Gardens. We will go to the beach in the evening to watch sea turtles nest, which happens from July to October. This is one of the world’s most important conservation areas for this species. All kinds of reptiles and amphibians can also be found here, including crocodiles, caimans, and the famous red-eyed tree frog. Happy that we had a chance to see the little bright green frog, we head back to the airport. Now we can say with certainty that, yes, Costa Rica does shine with its protected flora and fauna, which represent over 6% of the world’s biodiversity. ▲



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## In Ferrari style

Ferrari and Bang & Olufsen have initiated an original collaboration inspired by the aesthetics of the Italian carmaker. The collection features two sets of headphones and two speakers, including the Beosound Explore. This sturdy portable speaker from the Danish electronics manufacturer is dust and water-proof. Redesigned in Ferrari colours for this edition, the Beosound Explore offers up to 27 hours of play-time and weighs just 637 grams.

[bang-olufsen.com](http://bang-olufsen.com)  
CHF 249

## Chic and protected

The Ticino-based brand Ferronato has patented a metallic fabric that blocks electro-magnetic frequencies. Used to make accessories such as bags, wallets and backpacks, its Metafab® technology protects data on your connected devices and your payment cards. We especially appreciate the vault. This elegant product, when closed, seals off access via WiFi, Bluetooth, GPS, GSM and radio frequencies, which means no tracking and no listening.

[ferronato.swiss](http://ferronato.swiss)  
CHF 5,400

## Mustard from Montreux

Based on Lake Geneva in the Vaud region, Joël Beney, known as "Jo", is a former graphic designer turned artisan mustard maker, a move he made in 2017. Since then, he has developed countless variants of the condiment, guaranteed without preservatives or dyes, all home-made using mustard seeds from Cottens (Vaud) and Swiss honey. A gift box containing seven 100 g jars gives you the opportunity to try his creations in the following iterations: plain, garlic, tarragon, Espelette pepper, lovage, porcini mushrooms and balsamic vinegar.

[duditjo.ch](http://duditjo.ch)  
CHF 40



## Smart glasses for motorcycles

ConnectedRide smartglasses, BMW's latest release, project navigation data, speed and gear directly into the rider's field of vision in real time. With a battery life of about 10 hours, the glasses can be easily connected to a smartphone via Bluetooth. They come with two sets of interchangeable tinted and transparent lenses, with an adaptor available for wearers of prescription glasses.

[bmw-motorrad.ch](http://bmw-motorrad.ch)  
CHF 700

## The 3-in-1 travel pillow

The Petit Dormeur multi-function travel pillow can be worn around your neck, attached to your arm or mounted against a window using a suction cup. Designed by osteopaths, it provides effective support for a nap in the car or on a train or plane. Its soft French-made cotton fabric is machine washable at 30°C. Three colours are available and the kit comes with a matching pouch and sleep mask.

[lepetitdormeur.fr](http://lepetitdormeur.fr)  
CHF 56

## Eco-friendly cars

"This is not a car!" proclaims the Microlino website. So, what is this thing, with its funky 1950s curves? Between motorbike and bubble car, and only requiring a B1 driver's licence in Switzerland, the Microlino has hit the roads. The all-electric two-seater, weighing just 500 kg, brings to mind the classic BMW Isetta. But this modern microcar is built to be both ecological and economical. With a top speed of 90 km/h and a range of 230 km, it will appeal mostly to urbanites.

[microlino-car.com](http://microlino-car.com)  
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A LOOK  
INSIDE  
THE  
LAB

## New generation smart clothes

**ETH Zurich researchers have developed an electronic yarn that can be built into clothing to monitor the wearer's exhaustion level during physical exertion. Technology that could completely change the fitness game.**

BY PATRICIA MEUNIER

**A**thletes know it all too well. Injuries often occur at the end of a training session, when the body is tired and physical effort is less precise. To address this issue, a group of researchers from ETH Zurich led by Professor Carlo Menon, head of the Biomedical and Mobile Health Technology Lab, has developed a textile sensor that measures a person's exhaustion level during physical exertion in real time.

Basically, the patent-protected invention works with two components: a special yarn, which stretches or slackens with movement, and an antenna to send data. In the product presented by ETH, the electronic yarn is integrated into running leggings at the knee, and the antenna is embedded in the waistband. The yarn then expands or contracts, very precisely measuring the wearer's movements, as well as their fatigue, by detecting micro-variations in motion brought about by exhaustion. Over the course of their observations, researchers developed a model that shows the pattern of signal changes as the subject's fatigue increases.

With this device, athletes can easily check when they reach their limit and plan a break, while measuring and improving their performance. ETH has been testing the device for several years and in a variety of circumstances. For example, it has provided runners with data on their fitness and exhaustion and hockey players with data on their movements and stride. It also analyses regular everyday movements.

"With this technology, we can accurately monitor and analyse an individual's movements, as well as their physical exhaustion. There are multiple applications for that, with fitness and health currently topping the list," says Dr Chakaveh Ahmadizadeh, a researcher at the Biomedical and Mobile Health Technology Lab at ETH Zurich. Not many competing technologies on the market can track movements this precisely. "You can do it using cameras or by placing electronic pods all over the body. But these systems are not very practical for everyday use," Dr Ahmadizadeh explains. "Our technology, however, can be integrated into clothing without interfering with an individual's normal behaviour."

Compared with smart clothes already out there on the market, this technology has another major advantage. It works without a battery, as the expansion of the yarn generates the electrical signal. This could unlock new opportunities for a new generation of smart clothing that is easier to maintain and cheaper to produce on a large scale. ETH now intends to transform its prototype into a marketable product. "The technology is ready to depart from academic research and break through to the market. We are currently looking for funding to launch a startup to do just that. Our goal is to deliver a product that can help improve and maintain good health," Dr Ahmadizadeh says. "I believe that this new technology can be useful to a wide range of people, from top-level athletes to the general public." ▲

←  
The yarn developed by researchers at ETH Zurich is wound in a spiral around an elastic fibre.

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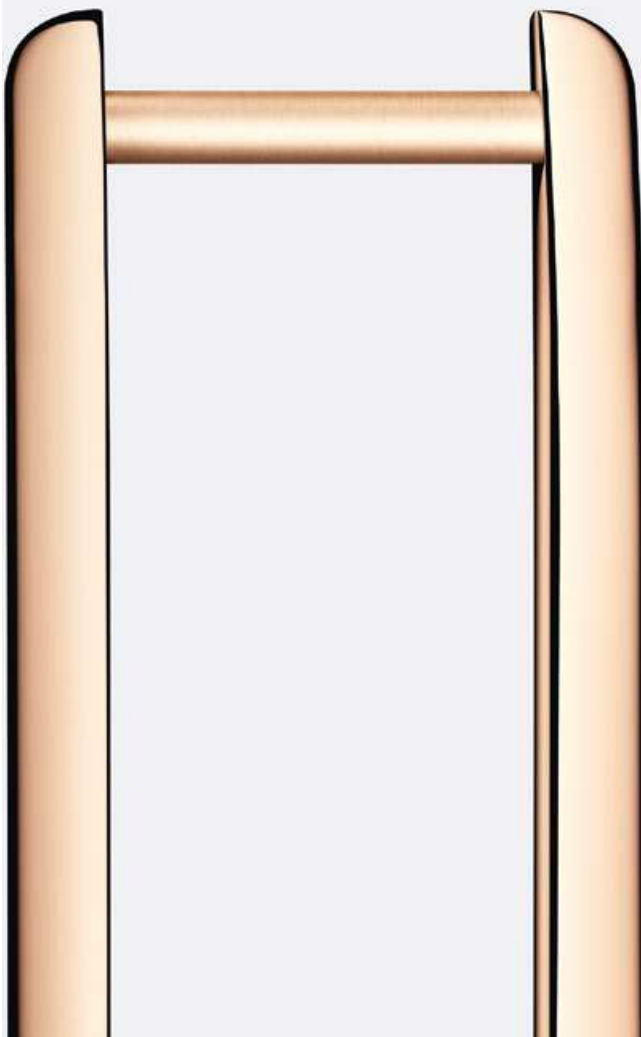
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