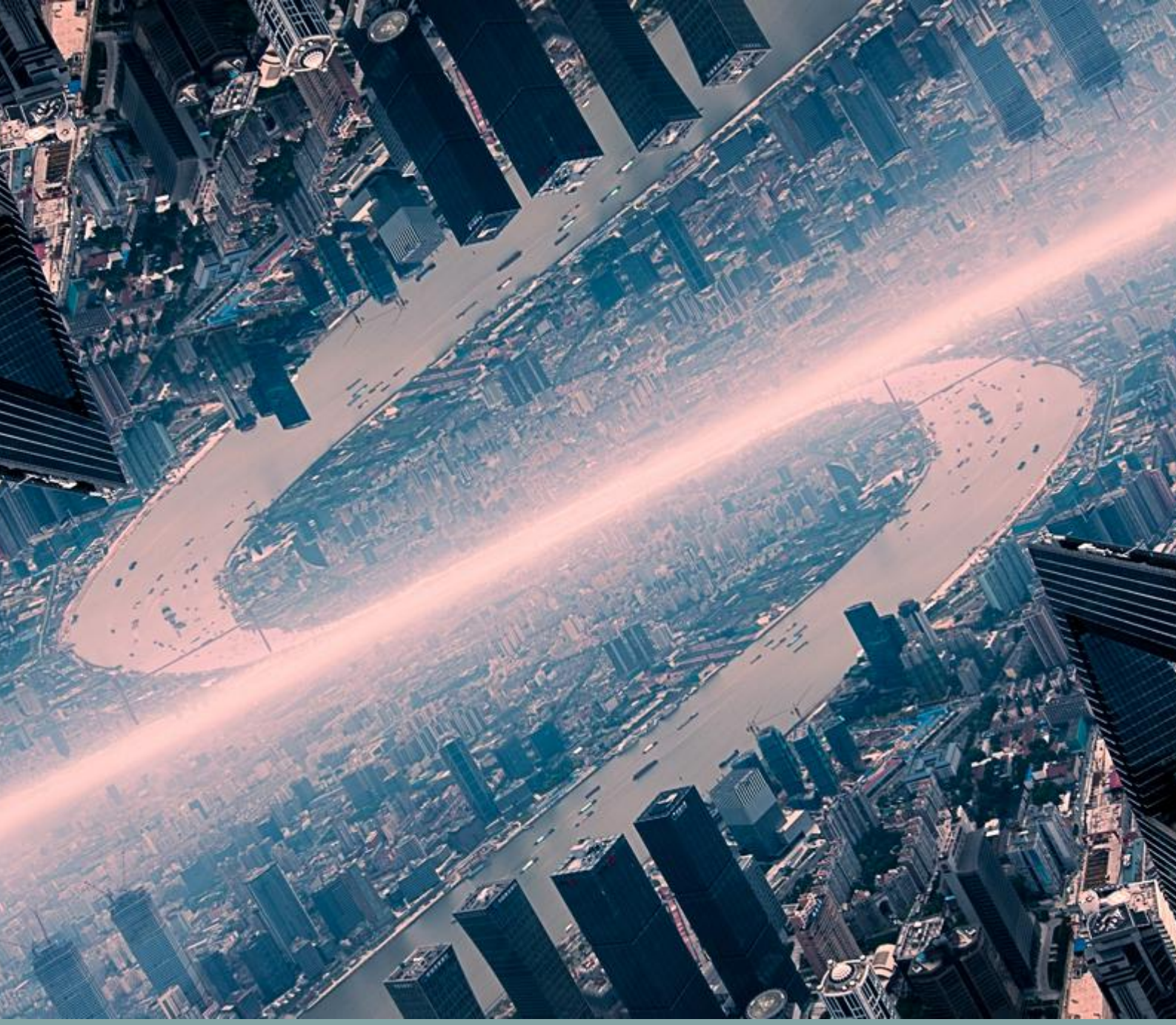

NEWSLETTER

JANUARY | 2022

PREDICTIVE ANALYTICS

JOINING THE DOTS

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TRANS: IN RETROSPECT YOU ARE ALWAYS SMARTER

The fall of the Berlin wall came suddenly and unexpectedly on 9 November 1989. Nobody saw it coming, least of all the intelligence services. A former MI6 agent recounted on that very evening he was in a meeting with the Bundesnachrichtendienst, West Germany's foreign intelligence service. The West German spies were in the middle of telling their British counterparts that it would be years before they would see change in East Germany, when someone put their head round the door and said: "Turn on the television: the Wall's open!"

This stunning ending to the Cold War was not on the radar of the intelligence services, military, politicians and academics in 1989. The fall of the Berlin wall appeared to happen out of the blue, because it was the result of a blunder. The East German Politburo had drawn up a plan to permit its citizens to apply for travel visas at police stations, in what was intended to be a long difficult bureaucratic process. The politburo's spokesperson had not been briefed and he was late to the press conference to announce its launch. Not having time to review the notes prepared for him, the flustered spokesman botched the announcement, telling stunned reporters that everyone was now free to leave East Germany "unverzuglich" immediately.

The press conference was broadcast live on East German telvision - by the time officials appeared again on television to explain visas were still necessary, three million East Germans had surged across the border into the West. On a blunder history turned and the world was changed.

The origin of the Berlin Wall and the cold war can be traced all the way back to the 1914 assassination of Archduke Franz Ferdinand, heir to the Austrian-Hungarian empire. This was the spark that ignited the First World War. The conflict caused the collapse of Czarist Russia, which was replaced by the Soviet Union. The Second World War was largely an outgrowth of the first. The Soviets victory in the east led to an 'iron curtain' descending across Europe,

dividing communist east from democratic west. Back to that fateful day in 1914, the assassin in waiting was in the wrong place, when the driver of the Archduke's car took a wrong turn which led straight into his path. Was it not for this small error, the Archduke would have avoided the assassin and an alternative history of the twentieth century might have evolved.

Within days of the fall of the Berlin Wall, huge advertisements for Marlborough and Coca Cola appeared on East Berlin buildings. The collapse of communism seemed complete after the disappearance of the Soviet Union from the global stage. At the time it was seen as the ultimate triumph of democracy and capitalism - a 1992 book with the title 'End of History' ventured there were no longer any challengers to these ideologies and security and freedom had been achieved.

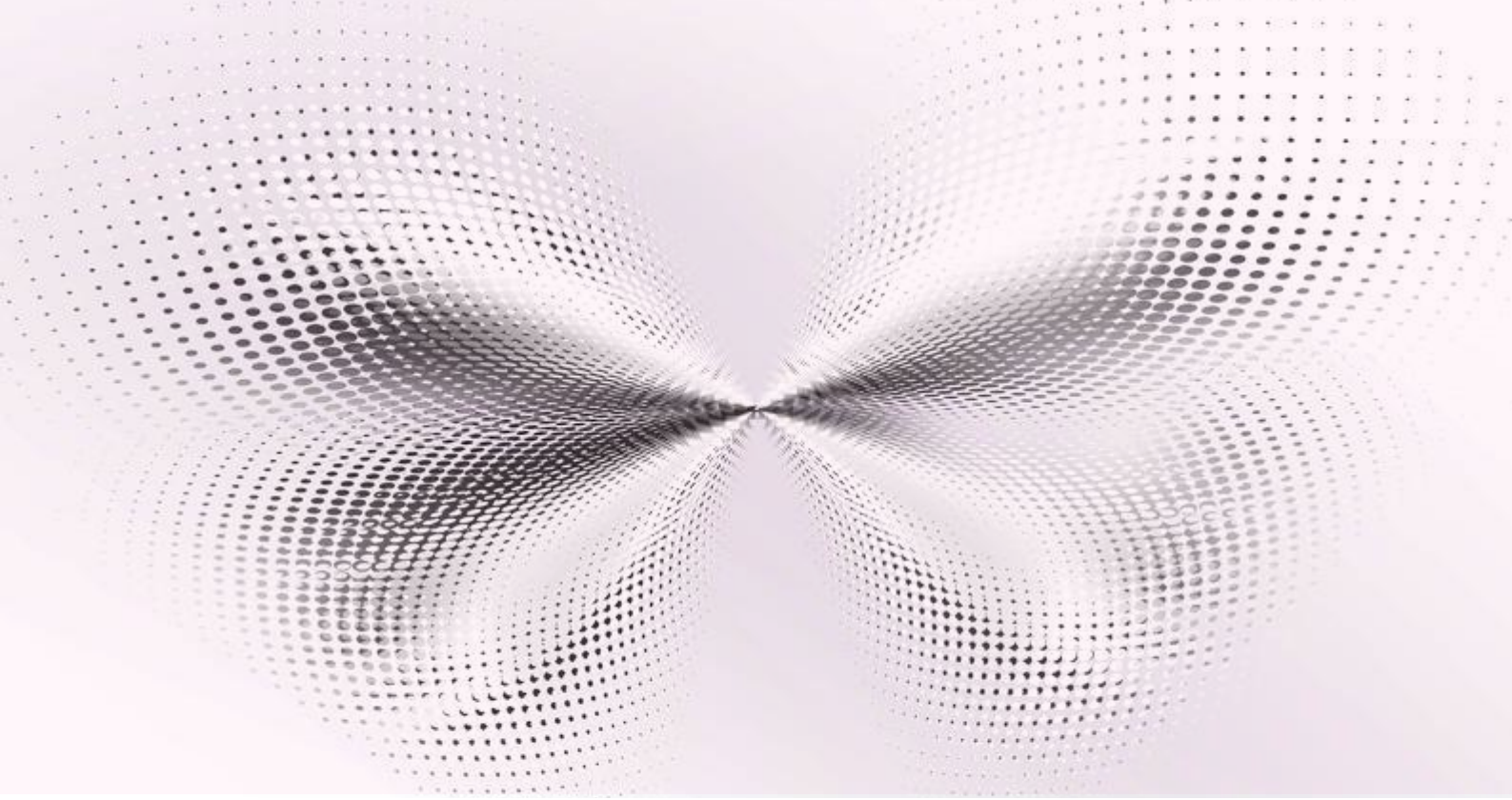
Utopia has since been postponed by the ascent of China to the status of a global superpower. In the 1970s China's economy was about the same size as Italy's. After Chairman Mao died in 1976 he was succeeded by a devoted Maoist, who was expected to continue the Marxist-Leninist class struggle. He was soon ousted by Deng Xiaoping, who proclaimed "To get rich is glorious!" His economic reforms would make China the fastest growing economy in world history. According to Singapore's Lee Kwan Yue, Deng Xiaoping rescued China from being a broken-backed state, which like the Soviet Union would have imploded.

New possibilities to predict the future through study of the past are evolving with the application of predictive analytics, which uses artificial intelligence to find patterns in 'big data' with which to identify risks and opportunities.

But when chance is inserted into the computer models that simulate financial markets, they are found to produce very different outcomes each time they are run. Though the starting conditions are the same, each simulation creates small random differences that lead to a different unfolding of the future.

Artificial intelligence has yet to improve the accuracy of macro or 'big picture' forecasts, while big data has proven better at connecting the dots rather than painting a whole new picture. History shows why, for

WHILE THE PAST CAN APPEAR TO HAVE A SENSE OF FATE OR INEVITABILITY, CLOSE STUDY REVEALS HOW THE FUTURE WAS CHANGED WITH JUST ONE LIFE, ONE ACTION, OR EVEN JUST A FEW WORDS.



THE BUTTERFLY EFFECT

SMALL CHANGES HAVE BIG CONSEQUENCES

The meteorologist and mathematician Edward Lorenz used the visual imagery of a butterfly's flapping wings minute effect on the air pressure in the Amazon, which sets in motion a chain of events that leads to a typhoon in Texas, to illustrate how something seemingly unrelated and insignificant can have an enormous impact.

Lorenz discovered this after using early computers to predict the weather. Having rounded off one variable in a weather pattern simulator from 0.506127 to 0.506, he found this tiny change drastically transformed the weather forecast. The 0.03% discrepancy appears trivial at first, but small errors and uncertainties can compound and cascade until their impact on the weather can be seen from space.

Meteorologists now know that even the precise location of an individual cloud has a huge effect on the weather. Such is the complexity of forecasting the weather, the US weather agency uses super-computers with the capacity to perform forty thousand trillion operations per second - even so its forecasts beyond a week remain little better than guesswork.

Understanding the butterfly effect can provide a new lens through which to view financial markets. Like the weather, financial markets are complex chaotic systems in which even the smallest unnoticed change can cause a chain of events that completely upend forecasts.

In 2018 a chain of events began with a murder in Taiwan. The fugitive fled to Hong Kong. The government of Hong Kong introduced an extradition bill so that he could be returned to face justice. Fearing the bill could also send Hong Kong residents to mainland China for trial, waves of protests and chaos ensued. This caused Hong Kong to enter recession six months before the pandemic hit.

In 2019 someone likely had an unfortunate encounter with an animal infected with covid. Undetected for months, the disease would go on to impact the lives of almost everyone on the planet and cause stock-markets around the world to plummet.

The value of accurate early predictions to investors is huge, but as any prediction can be undone by one unnoticed or unrelated event, risk can never be eliminated.

QUANTUM COMPUTING

A CHILD TRAVELLING BY HORSE & CARRIAGE IN THE EARLY 1900S WOULD IN ITS LIFETIME WITNESS MAN JOURNEY TO THE MOON. QUANTUM COMPUTING IS TO CLASSICAL COMPUTING WHAT SPACE TRAVEL IS TO THE HORSE & CARRIAGE.

The 'Many Worlds Interpretation' of quantum mechanics theorises that all permutations of the future exist in a 'multiverse'. Every-time you make a choice, another universe is created, in which another you made the opposite choice. If you chose heads in a coin toss, another you chose tails. Every choice cuts another path and the universes multiply into new ever increasingly different realities. This raises the intriguing notion that the investment decisions made by other versions of you made one rich and caused another ruin!

If this sounds all too much like science fiction, the concept of parallel worlds is being used in this world to develop quantum computers. A conventional computer uses switches that can either be on or off, using a binary system of 1 or 0 to make calculations. Quantum computer switches exist in a superposition of all states, that embrace all possibilities from 1.0000 and 0.0000. This endows quantum computers with the potential to perform more simultaneous calculations than there are atoms in the visible universe.

Chinese scientists recently announced that they had developed a quantum computer that can calculate in one millisecond, a task that would take the world's fastest conventional computer thirty trillion years.

Quantum computers use cases are largely experimental and hypothetical for now, but promise to revolutionise chemistry, medicine, materials, finance and artificial intelligence. They may go on accomplish things that we can't yet dream of and find answers to questions we did not know to ask.

Daunting technological challenges still need to be overcome before quantum computers are ready to transform the world e.g. the current technology works only at a temperature colder than outer space. The 'coming quantum computer revolution' might yet prove to be like the 'coming cold fusion revolution' (producing the power of the sun at room temperature) that never came. Progress in quantum computing will probably not follow a smooth path, instead, it will leap forward after a breakthrough that could happen at any time.

There are now over 200 quantum computing start-ups, in which venture capitalists and private equity announced investments of $1.7 billion in 2021. The first pure-play quantum computing company debuted on the Nasdaq a few months ago with a market cap of $2 billion. IBM hopes to become a household name again with the world's largest fleet of quantum computers and patents. The global market for quantum computing is expected to rise from USD490 million in 2021 to USD3.7 billion by 2030 - a compound annual growth rate of 25%. An ETF focused on the quantum sector that was launched in 2018 has also returned 25% p.a.

The first IBM Mark I computer introduced in 1944 , was a 50 foot wide, 5 ton machine which could accomplish one multiplication problem in six seconds. The Apollo 11 computer guidance computer in 1969 had a processor which ran at 0.043 MHz, while the latest iPhone processor runs at about 3230 MHz. This means that the computer in your pocket has over 75,000 times the computing power of that which got man to the moon. While quantum computing is in its infancy, it has past the science-fiction point and could prove to be humanity's next big step.

In 2019 a 'prophet' quantum computer was developed by Singaporean and Australian scientists that could see the future - at the subatomic level. So it won't permit investors to glimpse the winning trades of the future. Nor can it predict its own future, so the point at which 'if' turns into 'when' a quantum leap occurs remains hugely speculative. However,

IF QUANTUM SUPREMACY IS ACHIEVED, THE WORLD WON'T JUST ADVANCE 100 YEARS IN THE 21ST CENTURY – IT WILL BE MORE LIKE 10,000 YEARS OF PROGRESS

ALL INVESTMENTS INVOLVE THE RISK THAT YOU MAY NOT GET BACK ALL THE MONEY YOU INVESTED

THE VALUE OF AN INVESTMENT CAN CHANGE QUICKLY AND MAY GO DOWN AS WELL AS UP

PAST PERFORMANCE IS NOT A RELIABLE INDICATOR OF FUTURE RETURNS

INVESTORS SHOULD BUILD A DIVERSIFIED PORTFOLIO TO SPREAD RISK

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