The Ruffer Review 2024

A few good choices
Chris Bacon
PAGE 72

Not cricket
Eleanor Moriarty
PAGE 50

“ENVY IS ONE OF THE SEVEN DEADLY SINS. BAD FOR YOUR SPIRITUAL PROFIT AND LOSS ACCOUNT, AND BAD FOR EARTHLY DECISIONS, TOO.”

Alexander Chartres
PAGE 18

Something new under the sun

“People often think financial catastrophes occur because herds of humans panic when the emotional pendulum swings from greed to fear.”

Henry Maxey
PAGE 56

Gravity always wins
Teun Draaisma
PAGE 8

Blue Frontier
Taming the Wild West of the High Seas
Olive Heffernan
PAGE 40

Getting to the bottom of the dollar
Gemma Cairns-Smith
PAGE 112

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“ Machines can’t look outside the data.”

Teun Draaisma

PAGE 8

This little quiz from Simon Drew (simondrew.co.uk) is for entertainment purposes only. It contains no hidden investment advice.
Answers can be found inside the back cover.

Contents

Foreword 6
Jonathan Ruffer

MECHANISTIC MALADIES

Gravity always wins 8
Teun Draaisma

Minds over matter 18
Alexander Chartres

The Adventures of a Capitalist 34
Rory McIvor

REWRITING RULEBOOKS

Blue Frontier
Taming the Wild West of the High Seas 40
Olive Heffernan

Not cricket 50
Eleanor Moriarty

ANATOMY OF A RISE

What the hell is water? 88
Russell Napier

Permanence and change 100
Duncan MacInnes

Getting to the bottom of the dollar 112
Gemma Cairns-Smith

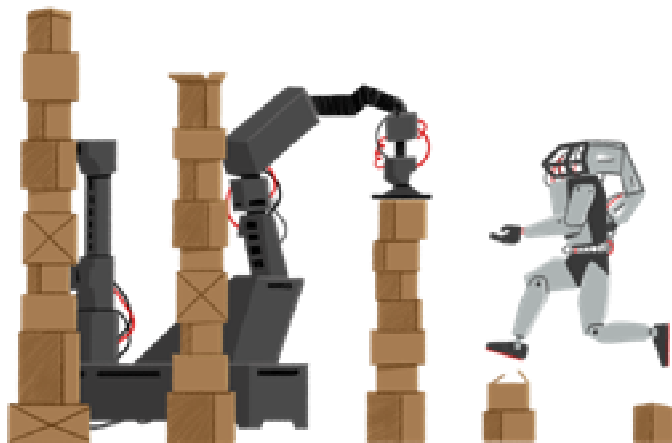
FORTUNE AND FORECASTS

Something new under the sun 56
Henry Maxey

A few good choices 72
Chris Bacon

Book corner 118

A market miscellany 78
Sophie Jamieson, Charlotte Mackay and Will Judge



Foreword

JONATHAN RUFFER
Chairman

IT IS STRIKING HOW MANY THREADBARE OFFERINGS ARE PROCLAIMED WITH THE OPENER, "ALL HUMAN LIFE IS HERE!"

It makes me shy of using the phrase, but nevertheless it is the one that comes to mind – and appropriately so, since investment is a shorn cat if it is simply an exercise in making money. That is necessary, but it is not sufficient.

We therefore write this Review offering partly to entertain, but mostly to give an insight into the range of minds which have come together to call the shots on our clients' behalf. It has articles by Henry Maxey, who has been the architect of Ruffer's investment process for over 15 years; Teun Draaisma, whose analysis of equity selection is especially interesting; and another of Alexander Chartres' restless, informed and intriguing analyses of the political-economic ecosystem.

This year's Review, as ever, reflects the team's keen interest in the history of finance – including a timely investigation of the dollar's ascent from Gemma Cairns-Smith. But it also looks forward. I was particularly excited at Teun's assertion that AI would be quicker, more accurate and more surely right than human labour and judgement on the market's next move, annexing the elixir which our fathers longed for – tomorrow's newspaper today.
What, though, of next year's newspaper?

That is the territory in which I am at home – the weather over the horizon. It is as clear to foretell as its timing is opaque: it's not a formula, alas, for making money, but it is the key to keeping it safe. I am struck at how the team has a steadiness of view which acknowledges those problems and in the same breath, looks forward with confidence to the times to come.

Gravity always wins

ARGUMENTS AROUND THE RISE OF MACHINES TEND TO POLARISE BETWEEN FEARFUL ANTIPATHY AND FEVERISH ANTICIPATION.

But what does the rise of machines mean for us as investors: an opportunity or a risk?

We contend that a knowledgeable, skilled and determined active investor can harness the rise of the machines to deliver superior performance over the long run.

TEUN DRAAISMA

Head of Investment Strategy

A ROMANTIC MIRAGE

The investing challenge is complex. Done well, investing serves a tremendous purpose. And it can be rewarding. As a result, our industry attracts talent and innovation. Most recently, this has come to include the fields of artificial intelligence (AI) and machine learning – broadly referred to as 'machines' in what follows.

The romantic mirage that man-plus-machine is better than machine-without-man has been disproved in many disciplines. Machines first beat the best humans at chess last century. Medical image recognition can be done more quickly and accurately by machines. ChatGPT passes prestigious graduate-level exams with ease. Humans are even being outdone in the last bastion of the creative arts, with the 2023 Sony World Photography Award unwittingly awarded to an AI-generated picture.

Machines with brute computing power, powerful techniques and ever-increasing data are simply superior in more and more fields.

All photographs of supercomputers by @docubyte

> “The romantic mirage that man-plus-machine is better than machine-without-man has been disproved in many disciplines.”

Systematic investing is nothing new. Renaissance Technologies – the Long Island based hedge fund – pioneered quantitative and systematic trading strategies in the early 1980s. Such was their success, founder Jim Simons' biographer hailed him as *The Man Who Solved the Market.*[1]

What is new is the scale these types of strategies have grown to and their prevalence, exerting ever greater influence on markets.

Is the victory of machine over man inevitable when it comes to investing too? In the very long run, probably. But, for the foreseeable future, we do not think so.

"Ah," the cynical reader might suggest, "of course an active investment manager would say that."

We might. And so it falls upon me to explain why.

OUR TWO CENTS

Two main contentions emerge from our thinking:

Firstly, while shorter-term investing is best done by machines, we think longer-term investing is still best done by humans.

Secondly, we think the rise of the machines in investing might hand more opportunities to active investors with a long-term focus.

This second point needs some immediate attention, before laying out the reasons for our thinking in more detail. In brief, machines' focus is typically on short-term drivers. And those are frequently unrelated to drivers that dominate in the long term. Therefore, a disciplined medium-to-long-term investor could actually benefit from the rise of systematic investing due to the potential for more short-term dislocations. Patient and strong hands might be required: a market with a heavy participation of machines might go further off-piste for longer than a market without.

DIFFERENT DAYS, DIFFERENT DRIVERS

The rise of systematic investing does not change the fact that, over the long term, fundamentals matter most. This idea was most famously captured by Benjamin Graham and David Dodd, who in 1934 drew the distinction between the market as a voting machine in the short run and as a weighing machine in the long run. Figure 1 shows how the market weighs fundamentals over the long term.

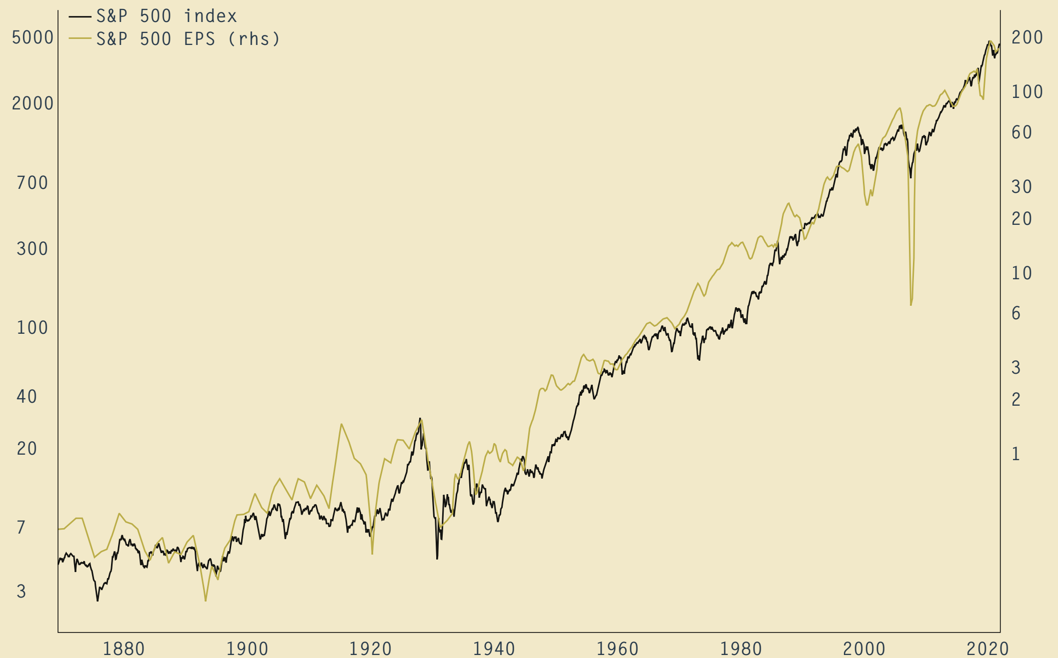
And it is in the weighing we think patient active investors can still prevail. Machines concentrate on the voting and the shorter term because that allows for more frequent investing. And humans cannot compete on volume or frequency of trading.

1 Zuckerman (2019), *The Man Who Solved the Market: How Jim Simons Launched the Quant Revolution*

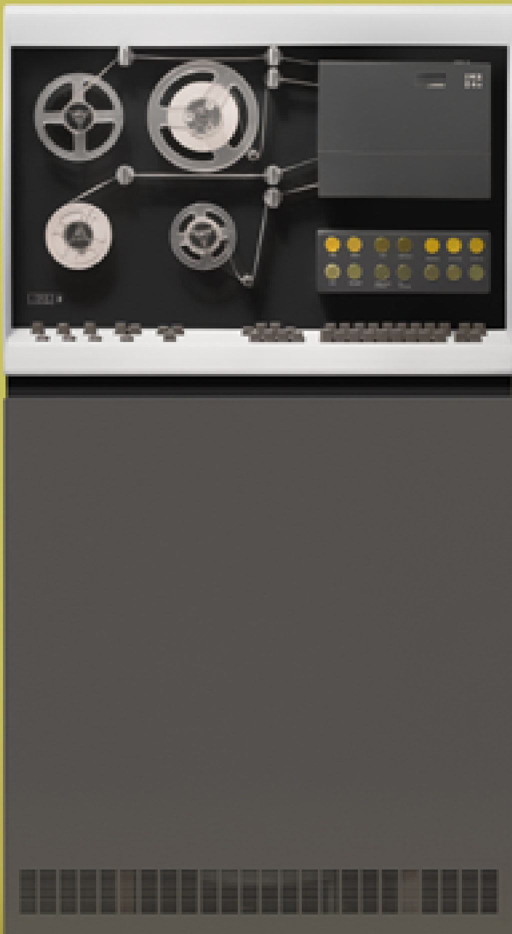
FIGURE 1

S&P 500 PERFORMANCE VERSUS EARNINGS, 1880-2023

(NOMINAL, LOG SCALE)



SOURCE: ROBERT SHILLER, US STOCK MARKETS 1871-PRESENT AND CAPE RATIO, DATA TO JUNE 2023



The investing factors that matter most in the long run, namely valuations and long-term growth, are much less important in the short term.

Nobel prize winning economist Robert J. Shiller laid the theoretical groundwork to explain this short-term stock market behaviour even before the arrival of machines as a dominant force. He studied instances in which short-term fluctuations in stock prices exceed what is justifiable for fundamental reasons, which he described and quantified as 'excess volatility'. He also noted the inherent impossibility of forecasting these short-term moves.

It is exactly because long-term drivers are very different from the collection of drivers that matter most in the short term, combined with machines' concentration on the short term, that active investors can have an advantage by focusing on the long term. Moreover, machines' short-term focus might create even more dislocations from those long-term fundamentals. More excess volatility, in Shiller's words.

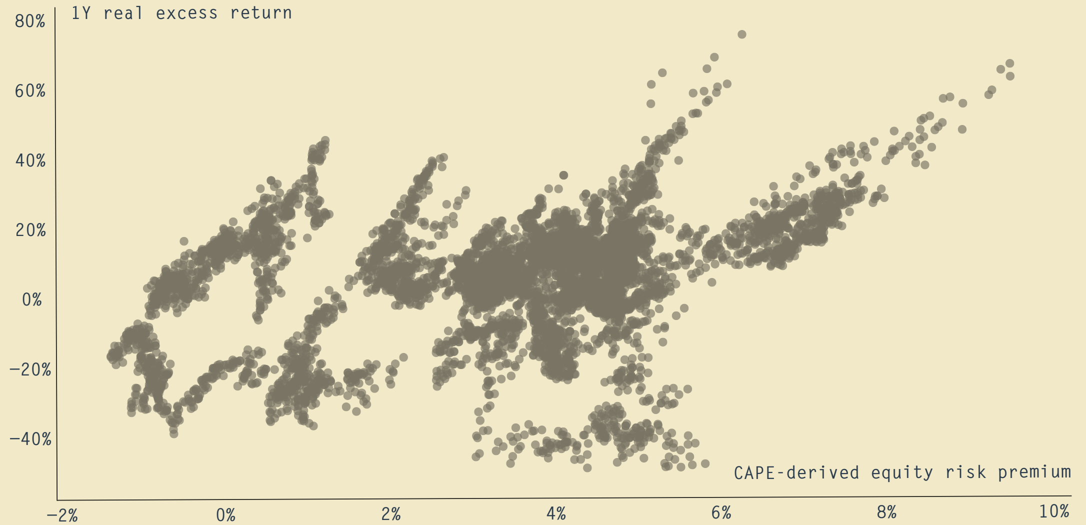
The following charts illustrate that valuations matter a lot in the long run (here defined as ten years) but very little in the short run (12 months). And that equity markets move up and down with earnings per share (EPS), eventually.

The US equity risk premium has been useless for one year predictions of excess performance of equities over bonds…

FIGURE 2

CAPE-DERIVED EQUITY RISK PREMIUM VERSUS SUBSEQUENT ANNUALISED 1Y REAL EXCESS RETURN FOR US EQUITIES

INDIVIDUAL DOTS REPRESENT A MONTH, DATA FROM JAN 1970. SOURCE: DATASTREAM, RUFFER CALCULATIONS

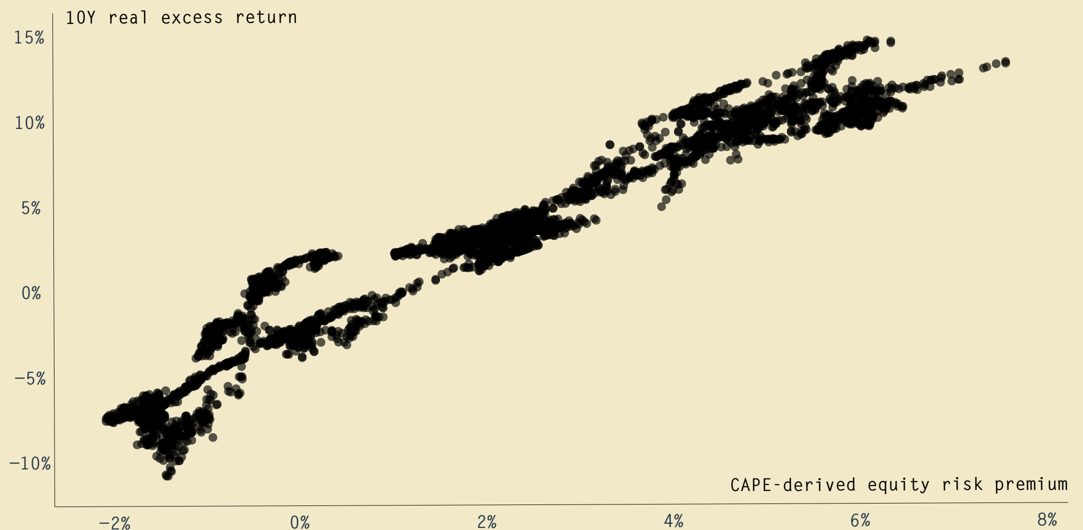


…but extremely prescient on a ten year view.

FIGURE 3

CAPE-DERIVED EQUITY RISK PREMIUM VERSUS SUBSEQUENT ANNUALISED 10Y REAL EXCESS RETURN FOR US EQUITIES

INDIVIDUAL DOTS REPRESENT A MONTH, DATA FROM JAN 1970. SOURCE: DATASTREAM, RUFFER CALCULATIONS



And EPS growth does not seem to matter for equity markets on a one year view.

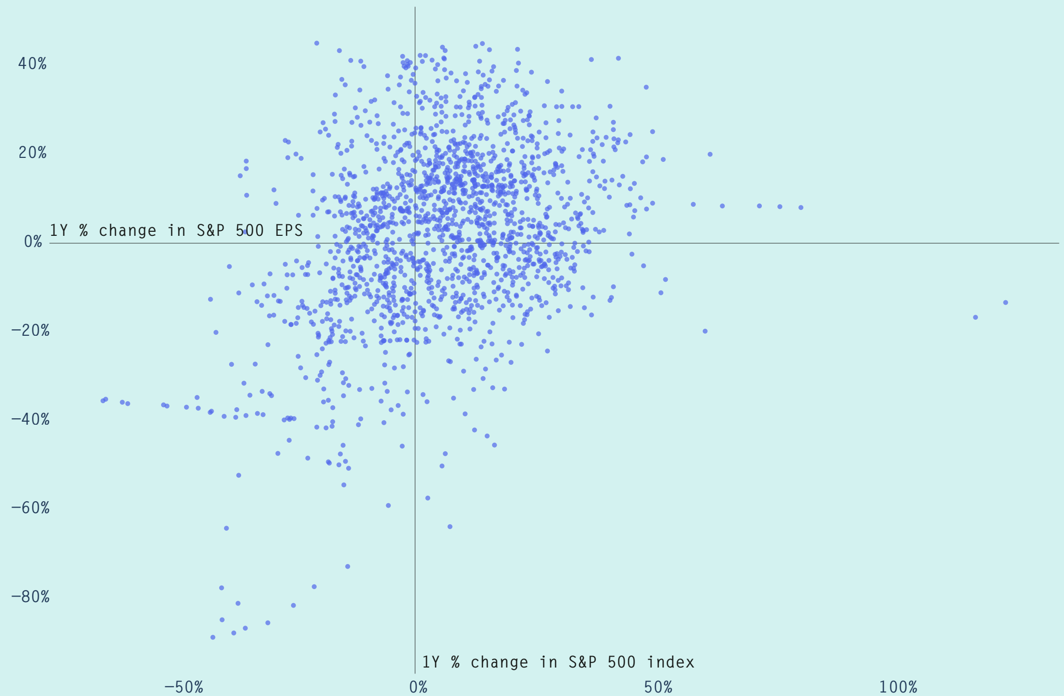


FIGURE 4

S&P 500 PERFORMANCE AND EPS GROWTH

(ONE YEAR, ANNUALISED, NOMINAL)

INDIVIDUAL DOTS REPRESENT A ONE YEAR PERIOD FROM JAN 1871. THREE OUTLIER POINTS >45% HAVE BEEN REMOVED. SOURCE: SHILLER (2005), IRRATIONAL EXUBERANCE, DATASET: US STOCK MARKETS 1871-PRESENT AND CAPE RATIO; RUFFER CALCULATIONS

But, on a ten year view, EPS growth and equity markets are more closely linked.

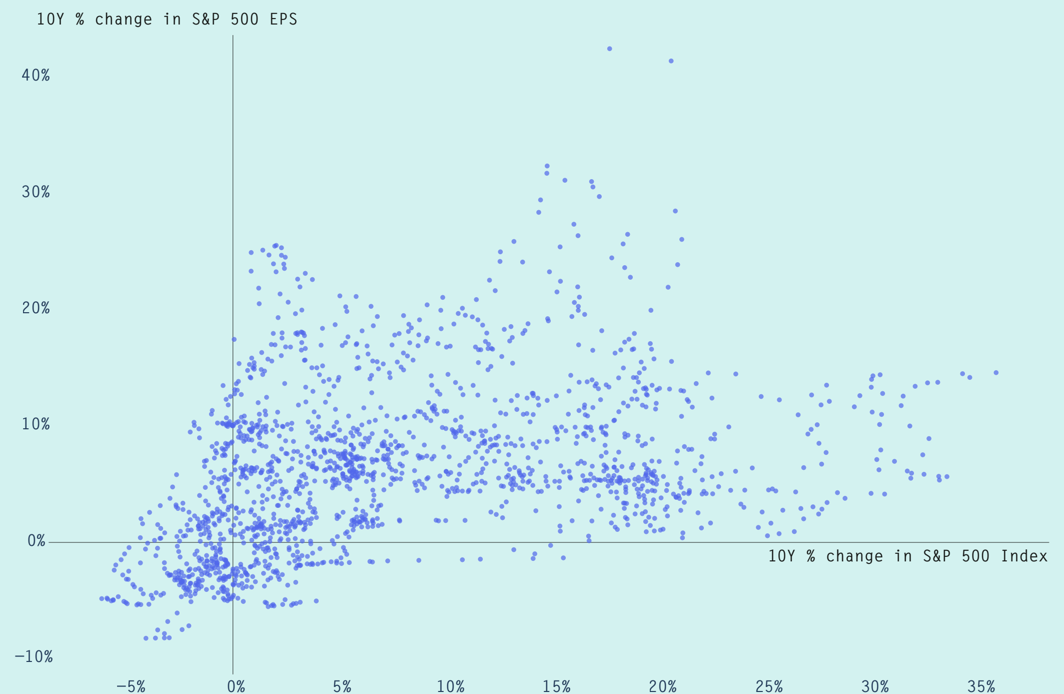


FIGURE 5

S&P 500 PERFORMANCE AND EPS GROWTH, 10Y ANNUALISED, NOMINAL

(TEN YEARS, ANNUALISED, NOMINAL)

INDIVIDUAL DOTS REPRESENT A TEN YEAR PERIOD FROM JAN 1871. THREE OUTLIER POINTS >45% HAVE BEEN REMOVED. SOURCE: SHILLER (2005), IRRATIONAL EXUBERANCE, DATASET: US STOCK MARKETS 1871-PRESENT AND CAPE RATIO; RUFFER CALCULATIONS

BET AGAIN

We expect the rise of systematic investing to produce more short-term dislocations from the long-term fundamentals. A patient active investor can exploit these dislocations.

As we've established, in the long run, fundamentals win out – that's Graham and Dodds' 'weighing'. While in the short run, it is the 'voting' that counts.

Let's investigate that voting more closely.

John Maynard Keynes described it memorably: over the short term, markets resemble a beauty contest where judges are rewarded for correctly guessing which person the other judges will think is most beautiful. In other words, fundamentals matter a lot less in the short term. We can think of this short-term voting as Shiller's 'excess volatility' or Keynes' beauty contest.

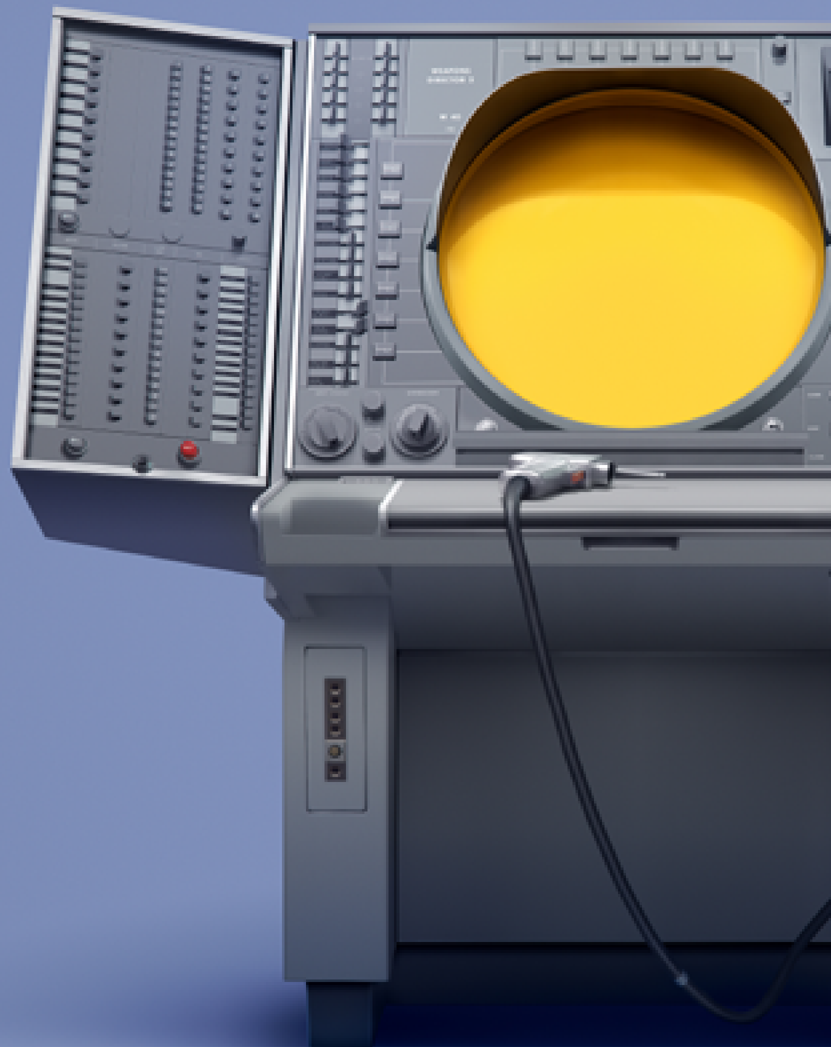
Different actors are doing the voting these days. Passive flows, momentum trading, systematic trading and dynamic volatility scaling are having a real impact.

We know that short-term trading and execution, especially at scale, is best done by machines and algorithms. But why?

Developed by Richard Grinold and Ronald Kahn, the fundamental law of active management states that an active investor's success depends on two things: their skill in picking winning bets; and the number of bets they can make.

Taken to the extreme, if you can make only a single bet with a 51% chance of winning in your entire lifetime, the outcome is a coin toss. But if you can make an infinite number of exactly these bets, your chance of winning at the end of the series (that is, you make money as opposed to losing it) is 100% – provided you aren't reckless in your sizing and disproportionately increase the amount at stake just as the inevitable bad run comes around.

> "We expect the rise of systematic investing to produce more short-term dislocations."

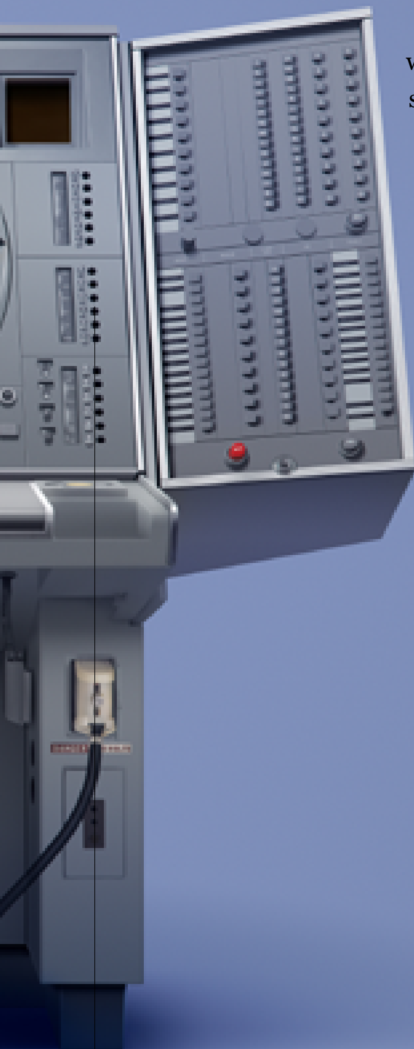


Automation allows investors to make many more short-term bets. This is one reason systematic investing tends to centre on the short term.

SHORT-TERM STRATEGIES

While valuations and growth are the key determinants over the long run, other factors are more important for short-term success. Short-term factors that are taken into account include price-based strategies such as momentum, reversal and dispersion, as well as other factors such as short-term momentum in fundamentals, and valuation and sentiment signals.

One famous short-term factor which most broad systematic equity strategies incorporate is 'one month return reversal' where the trade is simply to buy what went down last month and sell what went up. Clearly this bears no relation to the long-run fundamentals.



A technical note, for context. When combining signals and strategies that are uncorrelated, risk diversifies and return accumulates. What do I mean by that?

Systematic strategies tend to incorporate dozens of signals with sometimes very low Sharpe ratios (a Sharpe ratio denotes the return per unit of risk), signals that would not constitute adequate standalone strategies. Taken together, and assuming the signals are completely independent of each other (ie a pair-wise correlation of zero), the resulting Sharpe ratio of a combination of such signals is multiplied up by the square root of the number of signals. Thus, a combination of a 100 signals, each with a mediocre Sharpe ratio of 0.1, could rise to an excellent Sharpe ratio of 1, if combined. Risk diversifies, return accumulates. Hence systematic strategies' focus on lots of signals that might be short-term and technical.

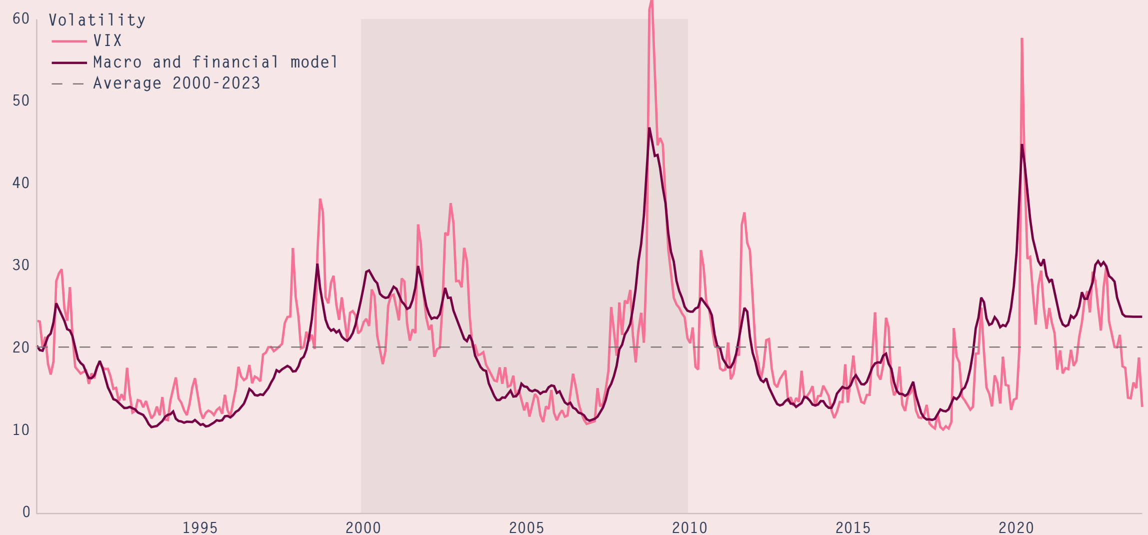
OPPORTUNITIES ARISE

As a result of these dynamics, we expect there will be more longer-term fundamental opportunities for the skilled active investor. One example we consider in portfolios today is implied volatility – the CBOE Volatility Index (VIX), also known as the fear gauge. We track a fundamental model that explains the VIX using indicators of macro and fundamental uncertainty. We find that these indicators have explained the level of VIX well historically. The model is estimated between 2000 and 2010 and explains actual VIX with good accuracy before 2000 and after 2010.

However, as Figure 6 shows, the deviation between the model's predicted value and the actual value has never been higher than today. This indicates a larger dislocation than usual, and a potential opportunity.

FIGURE 6

VIX EXPLAINED BY MACRO AND FINANCIAL UNCERTAINTY



COMPARES ACTUAL VERSUS PREDICTED VIX LEVELS. SOURCE: VIX SERIES (COMPRISING MONTHLY AVERAGES OF DAILY VALUES): BLOOMBERG, DATA TO DEC 2023. RUFFER MODEL BASED ON S. LUDVIGSON'S MACRO AND FINANCIAL UNCERTAINTY INDICES, DATA TO JUNE 2023, FORWARD FILLED TO DEC 2023

We use the example of VIX deliberately because it is central to the way many assets are allocated these days. Many systematic strategies take position sizes as a function of how risky markets are, proxied by recent volatility. If recent volatility is artificially low, the systematic strategy might conclude that a larger allocation is justified. If ever the volatility returns to its natural undisturbed level suggested by our model, many systematic strategies would have to reduce position sizes, and this would increase the volatility and induce further selling. This, in a nutshell, is the modern day 1987 crash scenario for risky assets we think is increasingly possible.

WHAT WE SEE AND FEEL

That then is the crux of our thinking. But it is worth noting a couple of other reasons we think machines remain inferior to humans at long-term investing. For now.

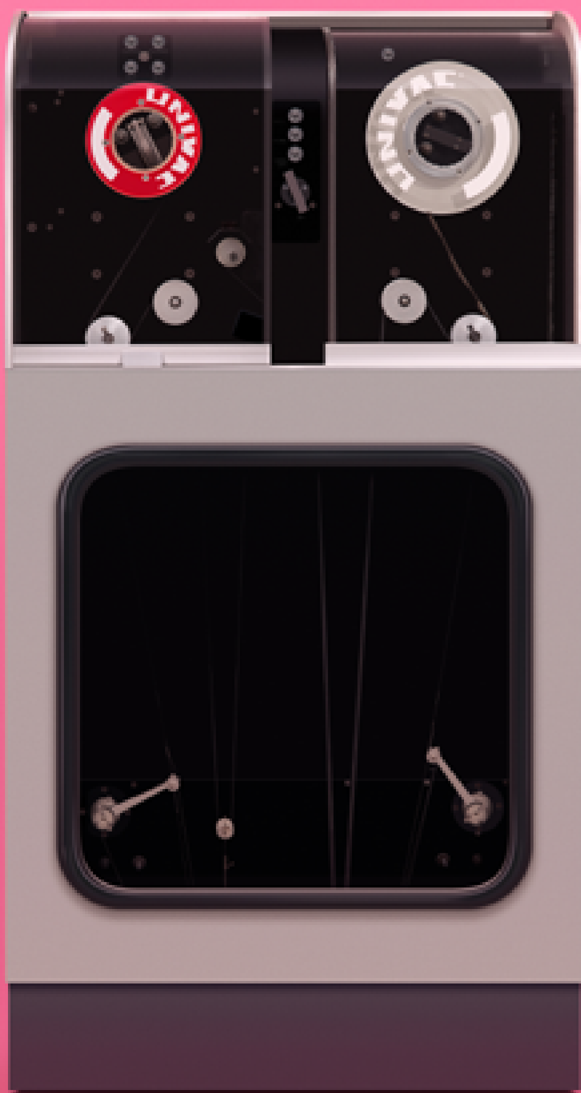
Machines can't look outside the data. A model's predictions can only spot patterns in the data it knows. Obvious, perhaps, but important. The majority of large language models' (LLMs) learnings, for instance, are based on recently digitised data.

Take inflation – its recent rise and subsequent fall caught many investors off guard, and the impact of rising inflation on asset prices was quite poorly understood. In caricature, if an inflationary episode has never occurred in your data set, your data-driven approach is not going to know what to do. As a sidenote, it was recognising the limitations of investors' data and experience that led to my work on a 2021 paper. This study analysed a wider set of inflationary data (going back to 1926) than was typical to identify insights for asset allocators facing heightened inflation risk.[2]

Fear and greed are eternal. So long as humans are involved with investment decision making, behavioural biases will continue to affect markets, leading to undershoots and overshoots in asset prices. And there's a difference between knowledge and wisdom. Knowledge is knowing a tomato is a fruit. Wisdom is knowing not to put it in a fruit salad. It applies to investing too.

2 Neville, Draaisma, Funnell, Harvey, van Hemert (2021), *The Best Strategies for Inflationary Times*

> "This, in a nutshell, is the modern day 1987 crash scenario for risky assets we think is increasingly possible."



To illustrate that market participants and structure can change, but behavioural biases have persisted, we refer to an old classic. The wisdom accumulated by Jesse Livermore – dutifully passed on to readers in Edwin Lefévre's *Reminiscences of a Stock Operator* – remains as relevant today as when it was published in 1923. Run your winners, cut your losses early, do not overtrade, get out of the market if you do not know what is going on, markets discount six to nine months ahead, buy when there are forced sellers. Whilst machines will gather and store knowledge more quickly and effectively, incorporating wisdom into an investment approach remains unique to man.

JUST FOR TODAY

Technology is essential to how we invest at Ruffer. We are already benefiting from the rapid recent advances in AI and machine learning. Our central repository of data and analytics runs on Python; we have developed our own RufferGPT for use across a range of repetitive labour-intensive tasks; our active investment decisions are aided and informed by quantitative models and back-testing; and we go to great lengths to understand forces that dominate markets, including new rapidly growing strategies such as those related to zero day to expiry (0DTE) options and systematic trading, so that we can benefit from our understanding and achieve our investment goals.

It is quite possible to envisage a day when there is no task a machine cannot perform better than a person. But, now and for the foreseeable future, a knowledgeable, skilled and determined active investor can harness the rise of machines to outperform them over the long run. ●

MINDS
OVER
MATTER

The power of consciousness in markets is neglected by mainstream economics. But the mind's ability to shape reality is critical for investors. That's doubly true today thanks to dual evolutionary leaps. First, proliferation of alien intelligence. Second, rapid changes in world order. These shifts are likely to widen the gap between reality and the market's perception of it, creating historic opportunities and risks. Minds matter more than ever.

The images for this article have been generated with the assistance of AI.

ALEXANDER CHARTRES
Fund Manager

PART ONE
MIND VERSUS MATTER

WHAT IS THE MIND'S RELATIONSHIP WITH REALITY? And how can investors exploit it? In last year's Ruffer Review, I examined how differences between the two hemispheres of the human brain shape our perception of reality, encouraging us to treat the external world as mechanistic, predictable and manipulable with precision. The problem is, however, that reality is the opposite of mechanistic.

That also holds for financial markets and economies. Both are complex adaptive systems which evolve continuously under the influence of conscious participants' choices. This underpins markets' eternal ability to surprise.

"Asset prices don't simply reflect economic activity, they increasingly drive it."

The power of minds to reflexively shape reality always matters to investors. But two evolutionary shifts make it particularly important now. First, the arrival of alien – read non-human – intelligence amongst us with rapid advances in machine learning. Second, a burst of rapid change in world order driven by generational shifts in geopolitics, technology, demography, climate, culture and the role of the state. These dual evolutionary leaps are likely to widen the gap between reality and the market's perception of it, creating historic opportunities and risks.

So mind matters, and 2024 could be a pivotal year as countries home to half of humanity – representing 60% of global GDP and 80% of equity market value[1] – go to the polls. There's just one certainty: great uncertainty means great opportunity.

DEAD OR ALIVE?

Envy is one of the seven deadly sins. Bad for your spiritual profit and loss account, and bad for earthly decisions, too. Modern economics suffers from physics envy – a desire for neat equations which reveal universal laws at the foundation of everything. Consequently, economics regards economies as mechanistic, populated by rational – or at least predictably irrational[2] – agents and trending towards equilibrium (a balance between supply and demand) over time. Meanwhile, financial market prices reflect information rationally and more or less immediately, according to the efficient market hypothesis.

But mechanistic approaches miss the power of mind and everything which comes with it: the 'hard problem'[3] of consciousness, perception, will, memory, imagination and expectations. These are inextricable elements – and drivers – of any system where human consciousness plays an active role. All add to the complexity facing investors daily.

REFLEXIVITY RULES

The fathers of economics understood mind's importance to markets. Adam Smith published *The Theory of Moral Sentiments* (1759) before his better-known *The Wealth of Nations* (1776) for good reason. The most famous modern take on the way minds change market behaviour is macro trader George Soros' work on reflexivity – the role of feedback loops in situations involving conscious participants. Because they both observe the market and participate in it, their "understanding [is] imperfect and…their actions will have unintended consequences."[4]

1 Bank of America
2 Kahneman (2011), *Thinking Fast and Slow*
3 Chalmers (1995), *Facing up to the problem of consciousness*
4 Soros (2003), *The Alchemy of Finance*

Crucially, reflexivity means that markets will not automatically return towards equilibrium. Instead, they will tend towards perpetual disequilibrium – boom and bust – as reflexive behaviour exaggerates market moves. For example, rising markets draw in more investors chasing performance, which pushes prices higher. Until something breaks. Credit – increasing or reducing borrowing – is often the preferred human expression of economic fear and greed.[5] And policymakers' decisions based on the idea they are dealing with mechanistic mean-reverting systems can have major unintended consequences.

REFLEXIVITY IN THE WILD

During the recent deflationary era, a myopic focus on price stability kept interest rates too low for too long, creating a series of record-breaking credit and asset bubbles, each bigger than the last. These bubbles were encouraged by the decision of emerging market exporters to fix exchange rates artificially low to accumulate foreign exchange reserves (predominantly US dollars) and thus prevent a re-run of the Asian financial crisis (1997-1998).[6] These reserves were recycled into US dollar assets, keeping US interest rates lower and asset valuations higher than would otherwise have been the case – something consciously ignored by the Federal Reserve.[7] Falling borrowing costs also fostered hyper-financialisation, with asset prices prioritised over the real economy (real life goods and services).

This has driven an increasingly tight reflexive relationship between the real economy and financial markets. For example, strong markets tend to boost the US economy, because CEOs typically hire workers as stock prices rise, and vice versa. So asset prices don't simply reflect economic activity, they increasingly drive it.

Meanwhile, onerous regulation in public markets and the privileged status of debt in the US tax code – itself contributing to financialisation – have encouraged a growing arbitrage between public and private markets. Investors are shifting lending and assets away from the regulators' glare into the so-called 'shadow banks' – institutions such as private equity and credit managers – which fall outside traditional banking regulations and can exploit private markets' 'lower volatility' (ie infrequent pricing) to carry more debt. With feedback loop upon feedback loop, this is a hall of mirrors where the concept of equilibrium itself becomes increasingly spectral.

"Reflexivity rules. Mood matters. And yet both are neglected by mainstream economics."

5 Ibid
6 Napier (2021), *The Asian Financial Crisis*
7 Bernanke (2005), *The global saving glut and the US current account deficit*

THE MARKET MIND

Feedback loops – whether influenced by conscious minds or not – are a key feature of complex adaptive systems. These range from rainforests and traffic to cities and financial markets. Other characteristics include non-linearity (ie small input changes can disproportionately influence outcomes), the spontaneous creation of order from local interactions (eg bird murmurations) and continuous evolution. Such systems also exhibit 'emergent properties': the system as a whole is significantly different to the sum of its parts, in unpredictable ways.

In financial markets, one of those emergent properties is a kind of extended conscious mind, one subject to the full range of emotions. In 1949's *The Intelligent Investor*, Benjamin Graham – the 'father of value investing' – embodied this insight in his iconic allegorical character 'Mr Market', who suffers mood swings ranging from bouts of euphoria to depression and phases of both efficiency and irrationality.

Building on insights from Adam Smith, Soros et al, and backed by veteran strategist Russell Napier, academic Patrick Schotanus' market mind hypothesis suggests "the market extends investors' minds [and] distributes their knowledge so it can be shared".[8] Prices are not simply a function of mechanistic market dynamics but incorporate "the phenomenon of market moods such as exuberance, depression, fear, despair, mania or euphoria that investors often report experiencing intersubjectively"[9] – ie between conscious minds.

A complementary take on how minds shape reality comes from the latest work of cognitive scientist Andy Clark, who views the brain as a simulation machine. "Contrary to the standard belief that our senses are a kind of passive window onto the world, what is emerging is a picture of an ever-active brain that is always striving to predict what the world might currently have to offer. Those predictions then structure and shape the whole of human experience."[10] In short, the brain is constantly comparing expectations with reality in a two-way exchange and adapting accordingly. Isn't that exactly what healthy markets do all the time?

Minds, therefore, have a strong reflexive relationship with reality, and expectations have huge power. Reflexivity rules. Mood matters. And yet both are neglected by mainstream economics.

MARKET NEUROLOGY

The precise relationship between mind and brain is beyond the scope of this article. But we know brain structure deeply influences our thoughts, even if it isn't where we do all our thinking. Clark notes, for example, that we already delegate more and more thinking to calculators and smartphones.[11]

Children's brains exhibit high neuroplasticity – an ability to rewire neutral connections and pathways as we learn and unlearn things. This plasticity reduces as we age. Neural pathways are like streams: the more flow they carry, the deeper they get, and so on. Thoughts become entrenched because we think them often, then they take on a reality of their own.

In the same way, market structure is probably key to understanding its psychology. In markets, we shape indices, benchmarks, portfolios and strategies, reflexively interacting with market flows, reinforcing the power of momentum and pro-cyclically drawing in – or pushing out – more money. Just as the brain's limbic system regulates humans' emotions, the

8 Schotanus (2023), *The Market Mind Hypothesis*
9 Ibid
10 Clark (2023), *The Experience Machine*
11 MacFarquhar (2018), thenewyorker.com

“Alien – ie non-human and inorganic – intelligence is at work all around us already.”

market's emotional responses are influenced by popular trading strategies' rules, which hard-code certain reflexes. For example, the level of market volatility influences how much money 'vol-targeting' strategies put to work in the market. If volatility jumps, machines pull money out of markets. If it falls, they add. (That passive funds under management in the US now exceed active may mean the market mind is accumulating plaque!)

Markets' capacity to regulate mood internally is being further eroded by a significant reduction in market makers' capacity to hold assets. With fewer buyers in panics, mood swings could be larger. This is a consequence of regulation after the global financial crisis, reminding us that we cannot ignore the role of institutions. And the stability of a market less capable of regulating its own mood will be more dependent on intervention from central banks and governments.

Each participant – from regulators and central banks to governments and asset managers – has a collective consciousness of its own as well as objectives which may not even be economic. For investors, therefore, reflexivity, the market's physical structure and its psychology matter at all times and in all places, but especially when the market mind is evolving quickly. With rapid advances in machine intelligence, that time is now.

ALIEN INTELLIGENCE

Last year saw a renewed surge of interest in UFOs or, as we're now supposed to call them, UAPs – Unexplained Anomalous Phenomena. Rumour has it 2024 may see confirmation of an exoplanet exhibiting signs of organic life. However, investors' gaze should be firmly terrestrial, recognising that alien – ie non-human and inorganic – intelligence is at work all around us already.

Sophisticated artificial intelligence (AI) programs do not reason like us. They also exhibit their own emergent properties. As ever more market activity is delegated to AI systems, the physical architecture of the market will change, and so will its psychology. We're likely to see higher speeds, liquidity feasts and famines (the machines typically trade within narrow ranges), greater tail-risks and even more powerful momentum. But will they increase investors' illumination and make markets more efficient?

BLINDED BY THE LIGHT

Data provides machines' food for thought. Yet, as the glut of often irrelevant information can make finding signals harder, a larger haystack may actually make markets less efficient, at least for a time.[12] Moreover, the greatest risks and opportunities will come from events and dynamics which do not appear in the data. After all, markets are evolving continuously and AI systems' memory extends only to digitised history.

This digital memory has been collected in the past generation – one partly defined by the remarkable stability of historically atypical asset correlations, notably a persistently negative correlation between stocks and bonds. This has been a product of a low inflation era which allowed central banks to cut rates at the first sign of trouble. But that's harder to do if there's more inflation around. So atypical data 'in' means

12 Wigglesworth (2023), ft.com

> **“It’s not the illuminated risks you should worry about. It’s what’s lurking unseen in the unexperienced – or unrecorded – darkness, past and future.”**

unrealistic expectations ‘out’ – especially when even the data collected is for markets not dominated by AI programs.

It’s like the old joke about the man drunkenly searching for his keys under a lamppost. A police officer stops to help. “Are you sure you dropped them over here, sir?” he asks. “I dropped them over there,” says the man. “But this is where the light is.”

This ‘streetlight effect’ also applies to risk. It’s not the illuminated risks you should worry about. It’s what’s lurking unseen in the unexperienced – or unrecorded – darkness, past and future. Equally, the biggest prizes exist outside the data.

MIND THE (DATA) GAP

The power of reflexivity and consciousness more broadly remains underappreciated by policymakers and mainstream economics. This has contributed to the build-up of systemic risk. Adding complexity, the nature of machine intelligence is changing the character of the market mind. Simultaneously, a growing reliance on data, far from closing the gap between investor perceptions of reality and emergent reality itself, risks anchoring expectations to an atypical period of history. And this is happening just as the broader ecosystem is undergoing a radical burst of evolution for which there is no precedent in the fossil record. The result? Massive gap risk is opening up. That gap is between market minds – both organic and increasingly inorganic – which are anchored to memories and expectations of a world which is disappearing, and a markedly different emergent order.

PART TWO
MACROMUTATION

DIRECTED EVOLUTION

Charles Darwin's theory of natural selection emphasises gradualism in evolution: incremental change over long periods. Previously, however, many biologists espoused saltationism, or sudden evolutionary leaps. Today, the broader market ecosystem is undergoing such a leap. But this burst is not driven by unconscious natural selection. Instead, it is a product of conscious minds' choices – let's call it directed evolution.

The era we are leaving has been characterised by ever-deeper global economic integration underpinned by a political settlement which favoured

relatively hands-off government, free trade and globalisation. US firepower underwrote it all. In other words, evolution was guided by political choices which drove lower inflation, interest rates and volatility. Many cultures consider paradise a well-watered garden, and this was a positively Edenic settlement – for the capital interest, at least.

Now, reflexive shifts in geopolitics, technology, demography, culture, climate pressures and the role of the state portend a more shock-prone environment of higher inflation volatility, which we call the New World Disorder. These changes are capable of creating disruptive dynamics unknown in market memory, and some deserve particular attention in 2024, a year when big choices – not all at the ballot box – could turbocharge the leap.

WELCOME TO THE JUNGLE

Political economy continues rewilding. The garden is becoming overgrown. In its place rises a jungle, more chaotic and competitive.[13] Challenging America's fragile imperium are a range of geopolitical beasts, big and small.

The Sino-US Cold War II continues (see Reviews *passim*), though both sides' domestic pressures have encouraged them to put a tactical floor under relations. Taiwan – which kicked-off 2024's bumper election schedule and around which Xi drew an even redder line during his summit with Biden – remains a live flashpoint. So do ongoing crises in the South China Sea – notably between China and US ally the Philippines. These are encouraging East Asia's arms race: Pentagon estimates suggest China's real defence spending is almost on a par with the US, when adjusted for purchasing power.[14]

But the breakdown is far wider than Cold War II, from which most countries are anyway seeking opt-outs. The International Institute for Strategic Studies counted 183 active conflicts worldwide in 2023, the highest level in several decades. That was before the eruption of war between Israel and Hamas, which could easily metastasise into a regional conflict.

Or the crisis in the Red Sea. Just when supply chains had recovered from covid-related disruption, Yemen-based, Iran-backed Houthi rebels reminded the world that the arteries of global commerce are increasingly exposed. Using drones and missiles, they imposed a *de facto* blockade on the Suez Canal by throttling the aptly named Bab-el-Mandeb (Gate of Tears) which separates the Red Sea from the Indian Ocean. Contested seas mean live firing gunboat diplomacy is back in a big way.

Joining the line-up of antagonists, Mother Nature herself choked another commercial artery with drought: the Panama Canal, which needs 200 million litres of water for each ship passing through. Even in Latin America, long a geopolitical backwater, Venezuela and Guyana are squaring off. Meanwhile, North Korea's increasing belligerence would make more headlines were it not for 'hotter' competition in the Middle East and Ukraine – whose fate hangs in the balance, together with the credibility of US security promises. Politics will decide whether the US retains the willpower to uphold the order it created. If not, expect further failures of deterrence and nuclear proliferation as countries fend for themselves. Geopolitics will remain an important driver of shocks and inflation volatility.

13 Kagan (2018), *The Jungle Grows Back*
14 Robertson (2023), foreignpolicy.com

YEAR OF THE DRAGON?

So, too, will China's economy. The post-covid re-opening proved a damp squib, and political instability did little to reassure investors: swathes of senior Communist Party and People's Liberation Army officials disappeared, including the foreign and defence ministers, and the remaining outposts of market-oriented thought, such as the central bank, had their wings clipped. Meanwhile, the prioritisation of security over growth continues. Xi will be hoping that 2024 – the People's Republic of China's 75th anniversary and the Year of the Dragon – augurs a change in fortunes.

Beijing faces chronic conditions, including a deflating property bubble which is feeding consumer and domestic demand weakness, a population in freefall and – care of a managed exchange rate – deflation. Moreover, its fiscal capacity is constrained by the reflexive relationship between land sales and local government financing: weak property prices mean weak government finances. Local government debt levels may be 50% higher than the World Bank believes, given the debt hidden in state-owned businesses.[15] The risk of contagion from property to the finance sector is high. And the security services, rightly fearing reflexivity, are threatening anyone reporting bad news about the economy.[16] Despite the power of mind in shaping reality, we all operate within constraints. No matter what Xi wills, debt, demographics and weak consumer confidence won't simply disappear. Were Beijing not trying to establish the yuan as a plausible store of value, it would probably already have devalued, sending a deflationary shockwave around the world. Russell Napier shares his take on these dynamics later in this year's *Review*.

"Both the fabric of the jungle and its residents are being altered from the roots up."

15 Yuxuan, Yang (2023), eastisread.com citing David Daokui Li and Zhang He

16 Bishop (2023), sinocism.com

SHOCK TRADES

But China doesn't need to devalue the yuan to export fresh deflation. It has moved rapidly up the value chain in key technologies of the fourth industrial revolution including robotics, batteries, solar, electric vehicles (EVs) and communications. As its gargantuan property bubble deflates, Beijing is increasingly pivoting to these new industries, hosing them with cheap credit.

Amplified by China's domestic demand weakness, deflationary waves of goods are about to break over the global economy. Again. Symbolically, BYD – a Chinese car brand – overtook Tesla as the world's biggest maker of EVs, and China is now the largest exporter of cars of all types. This flood of exports will accelerate a Western political backlash which has already begun (see the EU's EV subsidy investigation), increasing fragmentation.

SHOW ME THE (ALTERNATIVE) MONEY!

Yet industrial dominance is undermined by reliance on the favoured enforcement stick of Pax Americana: the US dollar. Growing geopolitical multipolarity sits increasingly incongruously with a still relatively unipolar currency and capital order.

Inevitably, the system is rewiring itself. Keen to use their own currencies more, rising powers are expanding bilateral trade, as evidenced by Indian purchases of Russian oil in rupees. The newly enlarged BRICS+ grouping is a likely testbed for a vastly expanded bilateral – or multilateral – trade and settlement network. This will be facilitated by new technologies, including central bank digital currencies, and will likely incorporate a neutral medium of exchange comprising gold and other commodities.

The end result: a disintermediation of Uncle Sam as financial middleman, and of the default recycling of capital surpluses into US assets. This would remove a central pillar of the current capital order and depress demand for US Treasuries just as deficits are soaring. These things happen slowly. Then suddenly. Such a shift could mean a much weaker relationship between the US dollar and emerging market prospects.

DIGITAL REFORMATION

Currency is just one way technological advances are helping to change the foundations of the financial ecosystem. DeepMind co-founder Mustafa Suleyman explains that "the coming wave of technology is built primarily on two general-purpose technologies capable of operating at the grandest and most granular levels alike: artificial intelligence and synthetic biology. For the first time core components of our technological ecosystem directly address two foundational properties of our world: intelligence and life."[17]

Both the fabric of the jungle and its residents are being altered from the roots up. From Amazon's new warehouse robots to aerosolised semiconductors[18] (yes, seriously), we have entered a new era in which machine intelligence shifts from the cloud to embodiment in the physical world. Even in the air we breathe. This is a revolution being driven by 'accelerationists' whose modus operandi is, quite literally, 'move fast and break things'.

17 Suleyman (2023), *The Coming Wave*

18 Chris Miller, in conversation

This increasingly inorganic ecosystem will only add to the surprise factor – both good and bad. Google DeepMind's discovery of 380,000 new materials in just a few days hints at the colossal productivity opportunities AI is unlocking.[19] Likewise, anti-obesity drugs could relieve pressure on public finances via reduced healthcare expenditure whilst boosting productivity through longer working lifespans. The potential is endless.

Unlike any previous general-purpose technology, however, machine intelligences are increasingly improving themselves. Unconstrained by biological limits, they will often reskill faster than publics and policymakers. As a result, our ecosystem now features evolution directed by human minds and, increasingly, by machine intelligence. This will have profound implications for where power sits, both between states and within them.

The issue is much broader than autonomous drone swarms or state-sponsored, AI-powered information warfare. Michael Creighton's novel *Jurassic Park* famously explores the unintended consequences of playing God with the foundation blocks of life. Our era will see not just governments and Big Tech equipped with the power to play God, but individuals and non-state actors, too. We might not be about to bring T-Rex back (yet, anyway), but the unintended consequences of the AI era are set to fatten tail risks dramatically and indefinitely.

DEBT AND TAXES

Leviathan – a powerful state with a united government – was the sovereign entity Thomas Hobbes believed could protect individuals from the state of nature: "a war of all against all". Beyond public security, modern states are increasingly expected to socialise other risks, from energy price shocks to rising mortgage payments.

With debt and deficits in many cases near peacetime records, the state is under more pressure than ever before: from technology's threat to its monopoly of violence (think of cyber insecurity or the inevitability of random drone attacks) and the provision of basic public order to the potential for major upheaval in labour markets. Then add in the costs of the energy transition, ageing populations which crimp the Ponzi-esque public finance model, and rearmament.

Fraying social cohesion – accelerated by technology and mass migration – completes the mix. Unsurprisingly, anti-establishment populist parties are in the ascendancy – a tide which will keep rising. That creates a strong incentive to keep policy loose to avoid economic pain, especially in an election year. But higher interest rates have taken us closer to the fiscal endgame, where heavily indebted governments manage their debt burdens more proactively. This is likely to include both higher tax burdens and financial repression, where interest rates are held below the level of inflation.

19 Fan (2023), singularityhub.com

20 Lyons (2023), The China Convergence, theupheaval.substack.com

21 Smith (1759), *The Theory of Moral Sentiments* – hat tip Russell Napier

> **"Our ecosystem now features evolution directed by human minds and, increasingly, by machine intelligence."**

THE GREAT PARADOX

Investors face an evolutionary paradox. On the one hand, genuine fragmentation and rewiring of world order. On the other, a convergence of sorts between East and West as governments grapple with high debt levels, restive populations and new technologies. As NS Lyons explains, "both China and the West, in their own ways and at their own pace, but for the same reasons, are converging from different directions on the same point – the same not-yet-fully-realised system of totalizing techno-administrative governance."[20]

Though given new life by mass surveillance technology, this is an old human instinct. Here is Adam Smith writing in 1759 about what we today recognise as both an ideologue and a technocrat: "The man of system...is often so enamoured with the supposed beauty of his own ideal plan of government, that he cannot suffer the smallest deviation from any part of it... He seems to imagine that he can arrange the different members of a great society with as much ease as the hand arranges the different pieces upon a chessboard. He does not consider that...in the great chessboard of human society, every single piece has a principle of motion of its own, altogether different from that which the legislature might choose to impress upon it."[21]

Technocracy is the ideology – and worship – of expertise, real or imagined. One which rarely accepts it is wrong. Look no further than the UK Post Office's Horizon scandal where faith in the system's infallibility led to the greatest miscarriage of justice in British history.

Policymakers everywhere are doubling down on managed outcomes. That's a recipe for further upheaval.

> "First, respect Mr Market's mood. This is especially important in periods of upheaval, where patterns are being broken and re-established. Now, for example."

PART THREE
IMPLICATIONS

How can investors incorporate the power of minds beyond their own into portfolios?

First, respect Mr Market's mood. This is especially important in periods of upheaval, where patterns are being broken and re-established. Now, for example.

Indicators for investor sentiment, positioning, trailing performance and narrative can help gauge this 'conscious' dimension. Extreme market pessimism can create tactical opportunities even where fundamentals are weak. And expectations rule.

In complex adaptive systems populated by conscious agents, standard measures of 'risk' – normal distributions, standard deviations, etc – fail to capture the potential extremes which non-linear, reflexive dynamics can deliver. Consequently, tail risks will often be underpriced, creating opportunities in derivatives.

But investors are not flying blind. We can observe the preferences and needs of other conscious agents and try to understand the rulebooks and limitations which guide their likely actions, whether Marxism-Leninism in China, the trading rules of dominant market strategies or the fact that, given the choice, indebted democracies generally don't do deflation.

Chronic challenges with geopolitics, the environment, debt and demography will encourage the existing bias to looser fiscal and monetary policy and more activist government. Combined with the emerging order's greater susceptibility to supply shocks, these will increase the chances of more volatile inflation leading to more unstable correlations between asset classes.

Bonds and equities are likely to be positively correlated more often. Alternative portfolio hedges could include commodities – energy, metals, gold and uranium – which offer optionality around currency, China and climate adaptation.

The structural preference for easier policy will get an extra boost from incumbents during a bumper election year which may yet accelerate or slow the pace of evolution.

The historian AJP Taylor mused that "nothing is inevitable until it happens". Today, US-led order hangs in the balance. What lies beyond the election horizon – whether that's an extended US-China thaw, resolution in Ukraine and a technology-fuelled Roaring Twenties or, as currently seems likely, something more dangerous – will largely be a product of minds meeting more or less moveable matters.

MIND OVER MACHINE

Markets and economies are not mechanistic. Like all systems suffused with consciousness, they are reflexively shaped by minds in a never-ending conscious dance.

Investors' job is to identify gaps between market expectations and the emergent reality they are themselves influencing. Then arbitrage them.

Twin evolutionary leaps in the nature of the market mind and the wider system are turbocharging that dynamic.

As increasingly powerful machine intelligence reinforces an all-too-human temptation to anchor to a passing era of atypical stability, the opportunity for their thoughtful organic rivals has never been bigger. Mind matters more than ever. ●

"As increasingly powerful machine intelligence reinforces an all-too-human temptation to anchor to a passing era of atypical stability, the opportunity for their thoughtful organic rivals has never been bigger."

the Adventures of a Capitalist.

(A tale about.)

MARK TWAIN.

WRITE ABOUT WHAT YOU KNOW. SAGE ADVICE FOR THE BUDDING AUTHOR. ADVICE WELL HEEDED BY SAMUEL LANGHORNE CLEMENS – ONE OF THE FATHERS OF THE GREAT AMERICAN NOVEL – BETTER KNOWN TO YOU AND ME AS MARK TWAIN.
Rise and ruin, poverty and prospects, feats of derring-do. These were the hallmarks of Twain's cherished canon, whose characters reflected many of their creator's own triumphs and tribulations.

RORY MCIVOR
Investment Communications Specialist

FOR MARK TWAIN, BRILLIANCE AND BANKRUPTCY WERE TWO SIDES OF THE SAME COIN. His journey to riches and back embodied the boom and bust of an era he would later christen. The story of his personal financial exploits reads like a tragicomedy, and his own inimitable narration provides an insight into the character of the most quoted (and misquoted) man in history.

PROSPECTIVELY WEALTHY

Clemens was born into shabby gentility. Comfortable, at least until his father – an attorney and judge – died shortly after Samuel turned 11. As he was growing up on the Mississippi river, the height of his teenage ambition was to become a steamboat pilot. It was an ambition he eventually realised (after working as a printer's apprentice) until the outbreak of the American Civil War scuppered any prospect of a life spent on the water.

It was after leaving for Nevada that Twain (the name we will use from now on) seems to have developed the financial worldview which would become a rudder in his personal and professional life.

"It is good to begin life poor; it is good to begin life rich – these are wholesome," he remarked. "But to begin it poor and prospectively rich! The man who has not experienced it cannot imagine the curse of it."[1]

For Twain, wealth was good. But great wealth was better by an order of magnitude. He suffered from nothing short of an infatuation with money, and so he set off – pen in hand – in pursuit of prosperity.

"For Twain, wealth was good. But great wealth was better by an order of magnitude."

BIG BUCKS FROM HUCK

The post-Civil War industrial boom meant there were more ways for Americans to get rich quicker than ever. But the speediest of all was to marry money.

A cynic might note the expedience of Twain's nuptials with Olivia Langdon, a wealthy coal heiress whose father gave the couple a mansion – complete with staff and carriages – on their wedding night. But the cynic would be wrong. Twain later recalled that he fell in love with Olivia at first sight (albeit of her photograph). Their lifelong union, of which he wrote fondly, endorses a more romantic interpretation of the marriage.

Twain achieved moderate success in his work as a newspaper reporter and published a collection of travel stories and humorous tall tales to public and critical acclaim. But his fortunes ratcheted up with the release of his first novels: *The Gilded Age: A Tale of Today (1873)*, *The Adventures of Tom Sawyer (1876)* and *Adventures of Huckleberry Finn (1884)*. Twain became a rich man in his own right. And this is where his misadventures as a capitalist begin.

1 Crawford (2017), *How Not to Get Rich: The Financial Misadventures of Mark Twain*

TAKES ONE TO KNOW ONE

In *The Gilded Age*, Twain satirised the gross materialism and political corruption emerging alongside the United States' economic boom led by the 'Robber Barons' and newly promoted 'Captains of Industry'.

America was financialising and there was money to be made.

Twain's sarcasm was thinly veiled: "Beautiful credit! The foundation of modern society. Who shall say that this is not the golden age of mutual trust, of unlimited reliance upon human promises?"

Wasn't this a wonderful era, he continued, in which a "distinguished speculator" could remark "I wasn't worth a cent two years ago, and now I owe two millions of dollars"?[2]

Sometimes, the faults we find in others are the things we dislike most about ourselves. Twain satirised the very greed with which he was afflicted. And it was avarice that prompted Twain's first foray into business.

A LIFE ROBBED OF ZEST

Whilst he had the glory of his writing successes, Twain believed he had missed out on some of the gravy. So, when it came to publishing *Adventures of Huckleberry Finn*, he decided to do it himself. By then, he had both the connections and the reputation to secure the publishing rights to the late President Ulysses S. Grant's memoirs. These were the first two releases from the Charles L. Webster & Co. publishing company – named after Twain's nephew, who he had put in charge of managing the firm.

Huck Finn was a triumph. Grant's autobiography was a colossal success.

Emboldened, the company took on some riskier titles, including an analysis of the speech of monkeys, a collection of sermons and a cookery book with 75 recipes for eggs.[3]

The payment model offered by the company frequently resulted in happy customers (they received entire sets of the latest releases on payment of a first instalment), but an unhappy accounts department (few customers felt obliged to honour the remaining instalments).

Twain tried to sell the publishing house. Several times. "I want to sell because I am not made for business," he said. "The worry of it makes me old and robs life of its zest."

But credit was drying up towards the end of the century. America was reeling from the Panic of 1893 – a stock market crash which precipitated the failure of 16,000 businesses and left 2.5 million people unemployed.

Eventually, he found a creditor, but not before haemorrhaging the vast majority of the royalties from his earlier successes.

"I oughtn't to say I was swindled out of all the money," he reflected. "Most of it was lost through bad business. I was always bad in business."

2 Warner and Twain (1873), *The Gilded Age: A Tale of Today*
3 Zacks (2016), *Chasing the Last Laugh*

> "There is a sadness to Twain's admission that his literary achievements, loving family and good financial health were not enough for him."

MISADVENTURE CAPITAL

Twain committed a cardinal financial sin in his business endeavours – his outgoings exceeded his income. And, in venture capital, he failed to follow another golden rule – sell your losers and know when to quit.

There is a sadness to Twain's admission that his literary achievements, loving family and good financial health were not enough for him. Success in the Gilded Age meant building an empire of wealth and letting the world know about it: "Man will do many things to get himself loved. He will do all things to get himself envied."

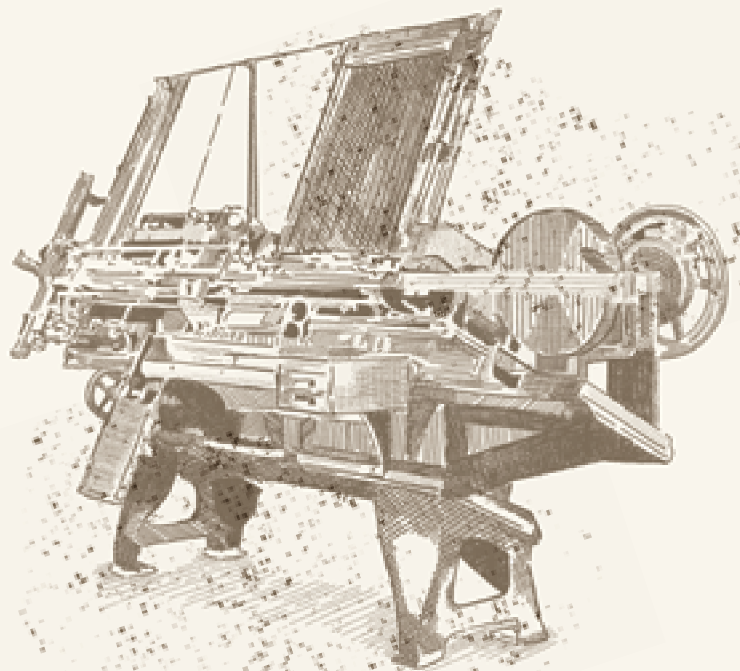
The zeitgeist demanded finding the next big thing and then betting even bigger.

The opportunity came in the form of an echo from his youth and his days as a printer's apprentice. It was a sophisticated new machine called the Paige Compositor, a typesetter which promised to revolutionise the printing industry. The prototype comprised over 18,000 individual parts and Twain, fascinated by science and technology, was awestruck by the engineering. He fell in love with an idea.

Twain stumped up an initial $5,000. But the complexity of the machine meant that further iterations – and capital – would be required. Twain began to sink what he could into the venture in the hope of a jackpot payout when they perfected the technology. By the mid-1880s, Twain was investing $4,000 every month (roughly $130,000 in today's money) to get the Paige Compositor over the line and into production. "A foot farther into the ledge and we shall strike the vein of gold. When the machine is finished everything will be all right again." He could not accept his losses with equanimity – this was sunk-cost fallacy in its cruellest form.

If the moustachioed maverick wasn't grey-haired at the beginning of the venture, he would have been by the end. In 1894, with the Paige Compositor still in development, Twain transferred his remaining assets to his wife (frowned upon in modern judicial systems) and was forced to declare bankruptcy.

Typically introspective, he later wrote, "There are two times in a man's life when he should not speculate: when he can't afford it, and when he can."



A RARE REPRIEVE

Most architects of financial failure are regarded with scorn and derision. Twain was an abysmal investor, but not a nefarious one. He was chastened by his pecuniary misadventures and resolved to settle his debts in any way he could. He kept writing and embarked on an international comedy tour, performing for adoring audiences across the world.

The American public – on learning of Mark Twain's financial catastrophe – did not cast him as a villain. That might have simply been because they loved his books, wit and unquestionable genius. Or they respected his fortitude in eventually making good.

More likely, the American public of the Gilded Age admired Twain's wholehearted pursuit of wealth because they could relate to it.

Twain was status obsessed, unashamedly ambitious, greedy and perpetually dissatisfied. His infatuation with money may have robbed his fans of more literary classics, yet he was not begrudged. Twain was loved not despite the inconsistencies and contradictions of his character, but because of them.

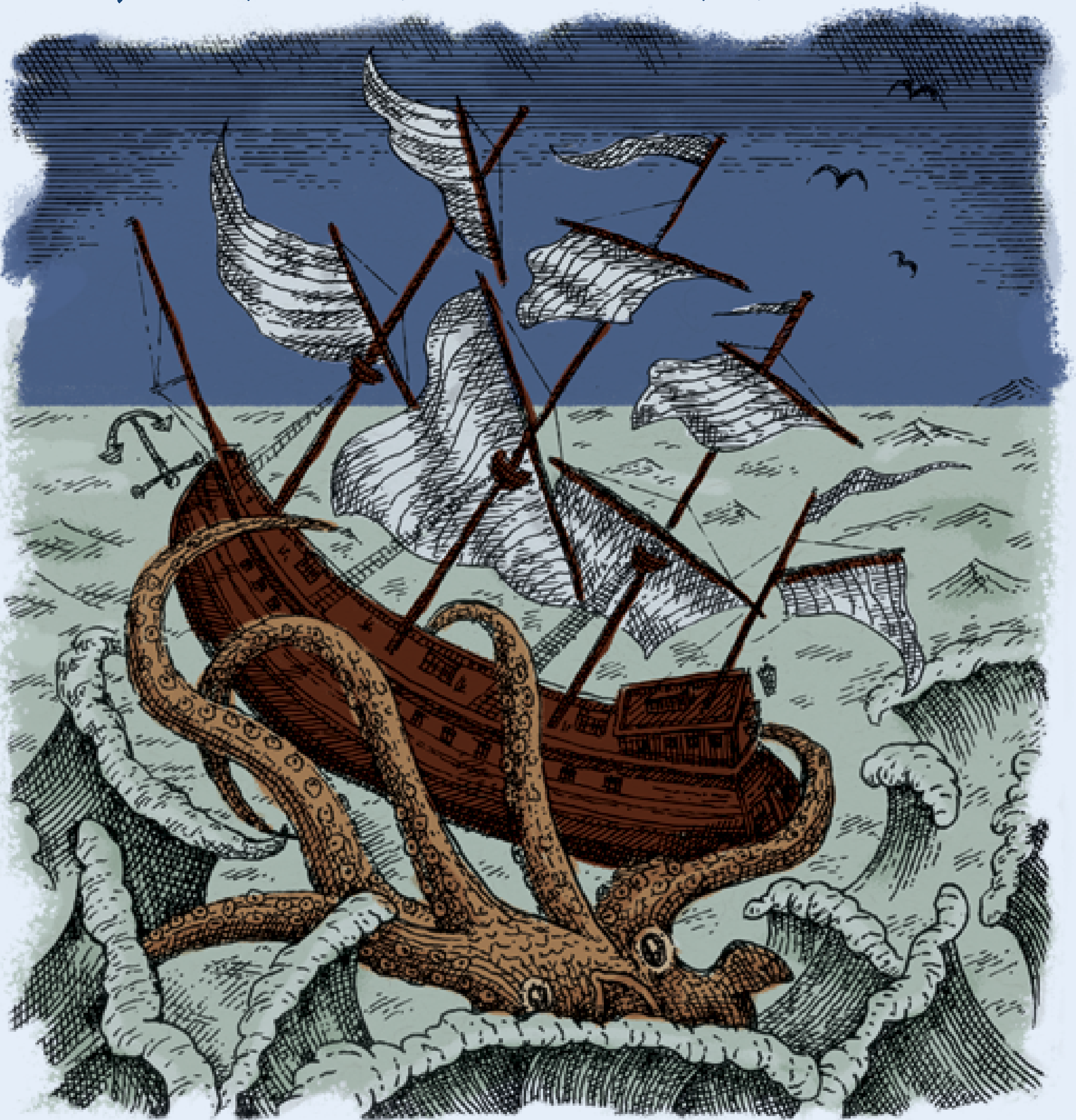
> "Twain was loved not despite the inconsistencies and contradictions of his character, but because of them."

THE OCTOBER EFFECT

In the year after his calamitous financial ventures came to a head, Mark Twain wrote in *Pudd'nhead Wilson*: "October. This is one of the peculiarly dangerous months to speculate in stocks. The others are July, January, September, April, November, May, March, June, December, August and February."

The best investors learn their lessons. For Twain, the lesson was that investing was best left to other people. ●

BLUE FRONTIER



Taming the Wild West of the High Seas

SINCE THE EARLY SEVENTEENTH CENTURY, THE MAJORITY OF THE PLANET'S SEAS AND OCEANS HAS BEEN LEGALLY OUTSIDE NATIONAL CONTROL. The result: maritime powers have plundered their resources and polluted their habitats at will. Now, a recently signed treaty aims to protect marine environments and divide the oceans' natural bounties more equitably. But will it be too little too late?

OLIVE HEFFERNAN

is an award-winning science journalist who writes about oceans and climate change. Her work has been published in Nature, WIRED, National Geographic, Guardian, and Scientific American, among other outlets. Olive was founding Chief Editor of the research journal Nature Climate Change. In 2019, she joined the faculty of Johns Hopkins University as an adjunct lecturer. Her first book, THE HIGH SEAS: Ambition, Power and Greed on the Unclaimed Ocean, *will be published in May.*

A REMOTE REALM, OUT OF SIGHT AND FREE FROM OVERSIGHT, THE HIGH SEAS ARE THE WILD WEST OF OUR PLANET. This unruly frontier has long harboured opportunists, rogues and outcasts, from the early explorers who first navigated these waters to the pirates who assailed them. Forbidding and mysterious, the high seas have been the backdrop of countless human triumphs and tragedies – of exploration and discovery, of storms, shipwrecks and lives lost. Even today, the high seas occupy a place of myth and legend in our collective consciousness.

Far less appreciated is that the high seas are a legal entity. They are that vast swathe of ocean beyond national control, usually starting 200 nautical miles from land.[1] Our largest earthly commons, the high seas cover 43% of the surface of our planet[2] and 95% of

1 Rothwell et al (2015), *The Oxford Handbook of the Law of the Sea*

2 Carnegie Endowment for International Peace (2023), *The High Seas Treaty is an Extraordinary Diplomatic Achievement*

> *"Almost half of our planet is an unclaimed ocean whose resources we are free to pillage or protect."*

its available habitat.[3] What that means, in broad terms, is that almost half of our planet is an unclaimed ocean whose resources we are free to pillage or protect.

To date, we've largely chosen the former. We've plundered the offshore ocean and used it as a dumping ground for our most noxious waste. Here, lax enforcement and apathy have become the status quo. But if the high seas are a free-for-all, open to rampant abuse, one event, in particular, sealed their fate.

It began on a February morning in 1603, when the crew of a huge Portuguese merchant ship, the *Santa Catarina*, were suddenly woken by a loud crash on the deck. Anchored at the entrance to the Singapore Straits, at the south-eastern tip of the Malay Peninsula, the 1,500-ton carrack was heavily laden with goods from China and India, including large quantities of musk, silk, earthenware and human captives to be sold as slaves. That night's anchorage had been a final stop-over en route to Macau, where the *Santa Catarina* would collect yet more riches before sailing back to Portugal with its cargo.[4]

Yet as dawn broke, the crew of the *Santa Catarina* found themselves under attack by Dutch admiralty sailors, who ransacked and seized the vessel, sailing it to Amsterdam to auction its valuable contents. Viewed as an act of piracy by the Portuguese, the incident led to a fierce rebuttal by the Dutch, who claimed they were acting in self-defence: the Portuguese, they argued, were unfairly monopolising the open ocean, an area they considered so vast with resources so bountiful that no single nation could either appropriate or exhaust it. The Dutch reasoning led to a rewriting of international law, and a recognition that the high seas are a global commons.[5]

It has since become all too obvious that our vast, deep ocean is neither inexhaustible nor immune to our presence. It is, to the contrary, incredibly fragile and increasingly under threat.[6] One quarter of marine species are already at risk of extinction, and roughly 60% of marine space is suffering from growing cumulative impacts.[7] Fishing takes place alongside shipping, military exercises, scientific research, and oil and gas exploration, in seas that are warming and awash with plastic and may soon be subjected to deep-sea mining or large scale carbon storage to alleviate climate warming.

With the high seas governed by a liberal access regime, there has been no global law to curb our offshore expansion or to protect life in these waters. But that is now set to change. In March 2023, UN member states secured a historic deal to protect the high seas. Twenty years in the making, the High Seas Treaty has now been signed by 80 nations, and while it still requires ratification by signatory states – a process that may take several years – it will fundamentally change our relationship

3 United Nations
4 Van Ittersum (2003), *Hugo Grotius in Context: an Heemskerck's Capture of the Santa Catarina and its Justification in De Jure Praedae, 1604–1606*
5 Nellen (2015), *Hugo Grotius: A Lifelong Struggle for Peace in Church and State, 1583–1645*
6 Jouffray et al (2020), *The Blue Acceleration: The Trajectory of Human Expansion into the Ocean*
7 Halpern et al (2019), *Recent pace of change in human impact on the world's ocean*

with the offshore world.[8] This treaty heralds a new era that will strike a better balance between the use and protection of this half of our planet.

A NEW OCEAN ERA

Currently, just 1% of the high seas are off limits to extractive industry, inside a marine protected area (MPA).[9] Yet scientists say that we need to set aside at least 30% of ocean space, and manage the rest in a way that is fair and sustainable, if we are to avoid a further collapse of global fisheries and stem the loss of marine biodiversity.[10]

In December 2022, almost 200 nations committed to protecting 30% of the ocean by 2030.[11] Until now, nations have had the legal right to create MPAs within their own waters, including their territorial seas, which typically extend up to 12 nautical miles from land, and exclusive economic zones (EEZs), which typically extend 200 nautical miles from land and give them first rights on mineral and fishery resources.[12]

Creating marine reserves in international waters, however, has been rather more difficult. A few small MPAs exist on the high seas, but only one is deemed effective. Created in 2016, the Ross Sea MPA, in Antarctica's Southern Ocean, covers 600,000 square miles, making it 1.5 times the size of the largest national park on land. A total of 432,000 square miles, or 72%, of its ice-covered waters are strongly protected.[13]

Without a legal mechanism to create new MPAs in international waters like the Ross Sea reserve, the 30% goal would be impossible to achieve. The High Seas Treaty provides that mechanism. As part of the deal, nations agreed on a process for creating a network of MPAs that will be

8 United Nations Treaty Collection
9 O'Leary et al (2019), *A Blueprint for Ocean Protection*
10 Ibid
11 European Commission
12 Rothwell et al (2015), *The Oxford Handbook of the Law of the Sea*
13 Brooks et al (2021), *The Ross Sea, Antarctica: A highly protected MPA in international waters*

interconnected and representative of the diversity of marine life and habitats on the high seas. The treaty will give UN member states the authority to propose new MPAs, and a science-led council will then evaluate, and approve or reject, them. Crucially, new MPAs can be created by a majority vote, without consensus.

But even if 30% of ocean space is protected, conservationists maintain that we must manage the remaining 70%, and its resources, sustainably. One way to achieve this, agreed as part of the High Seas Treaty, is to assess any likely harm from new activities. There is precedent here. Currently, on land and in coastal waters, new commercial activities have to undergo an environmental impact assessment (EIA) to weigh up any benefits against potential harm to wildlife and to ecosystems.

On the high seas, only some pursuits are regulated in this way. It wasn't until 2006 that bottom trawling – one of the most destructive fishing practices – needed an EIA. Even now, open-water farming and the disposal of space waste, for instance, do not need to consider environmental harm to the high seas. Conservationists want to see emerging offshore interests – such as new fisheries, open-ocean carbon storage or even sea-steading – tightly regulated. The new treaty should make it mandatory for these activities to undergo a strict review before getting the green light. This will do little to change the status quo of resource extraction on the high seas, but it will likely force us to consider, more carefully, how we use this space and whether pursuits such as deep sea mining or open-ocean carbon storage should proceed.

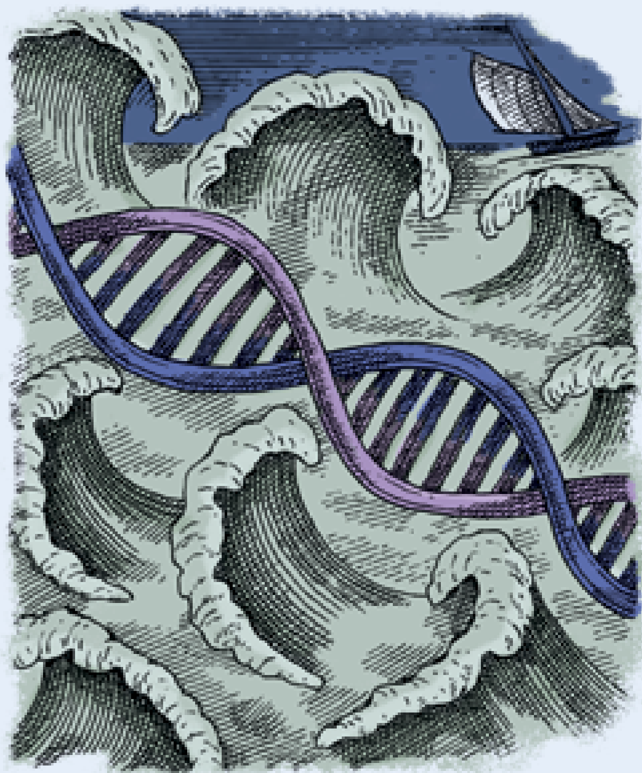
These decisions are unfolding at a unique point in human history, when atmospheric greenhouse gas concentrations have reached levels not seen on earth for 3 million years.[14] Each year, the ocean soaks up roughly a quarter of the emissions we pump into the air. It's also absorbed 90% of the extra heat we've generated in the past 50 years.[15] The depths of the high seas, in particular, are our greatest buffer against climate change. But the ocean can only continue as our ally if it remains healthy. Our choices matter.

SHARING THE SPOILS

The history of the high seas is not only a story of exploitation. It's a story of inequality. Wealthy empires – China, Spain, Portugal, Britain, the Netherlands – sent the first fleets of vessels across the unknown ocean in search of new lands and resources. Many formed mega-corporations, such as the Dutch East India Company, tasked with ensuring that their wealthy elites had a constant supply of luxury goods. Textiles, silks, jewels, coffee and spices all flowed in abundance from abroad.

This imbalance continues to the present day. Currently, 90% of patents on natural products are owned by corporations or institutions in the global north, with 90% of the source material coming from the global south.[16] In the past three decades, ocean exploration has been a luxury afforded to wealthy nations, most notably the US, the UK, Canada, Japan, Australia, Russia and Germany. Considering the cost of a research expedition can run to several hundreds of thousands of dollars, and millions in some cases, not to mention the investment required to build icebreakers or to develop new technologies such as deep-sea submersibles and sophisticated

14 CNN
15 Ramirez-Llodra et al (2011), *Man and the last great wilderness: human impact on the deep sea*
16 Hickel et al (2022), *Imperialist appropriation in the world economy: Drain from the global South through unequal exchange, 1990-2015*



> "Currently, 90% of patents on natural products are owned by corporations or institutions in the global north, with 90% of the source material coming from the global south."

lab equipment, it's clear that only very few nations can afford to be involved.

One ambition of the High Seas Treaty has been to remedy the inequality between countries that can afford to explore and use the high seas, by agreeing to build capacity in developing nations, including the transfer of technology. In practical terms, this could amount to training for scientists or opportunities to take part in high seas research expeditions.

But the High Seas Treaty goes further in addressing past inequalities. One aspect of the deal is a global agreement to share genetic code from marine creatures. Negotiations on this issue were fraught with tension because, under the existing UN Convention on the Law of the Sea (UNCLOS), genomes sourced from the high seas arguably belong to no one – or everyone. Historically, world powers – including the UK, the EU, the US and Japan – with the technology and financing to scour the high seas in search of new products argued for the right to patent and solely profit from these resources. They wanted to maintain the liberal access regime of the free seas.

Developing nations, including African and Caribbean countries, argued that genomes collected on the high seas are common heritage and that profits, and other benefits such as data derived from the use of these resources, should be shared. In securing the treaty, nations resolved this thorny issue, and agreed that marine genetic resources belong to all of humanity. A portion of the profits from their commercialisation must therefore be pooled once the treaty is enforced.[17]

17 Heffernan (2020), *Why a landmark treaty to stop ocean biopiracy could stymie research*

DRUGS FROM THE DEEP

But why, you might wonder, would anyone care to own the genome of a marine creature found lurking in the ocean's depths? Since the 1950s, scientists have discovered roughly 34,000 compounds from marine organisms – animals, plants and microbes – with commercial potential.[18] Some of these discoveries have led to successful products with a wide variety of applications: a deep-sea microbe has an important role in the development of a biofuel;[19] a gene sequence from a marine microbe has been found to boost the omega-3 content of rapeseed oil;[20] and a fish antifreeze protein – as delicious as that sounds – is now being used to improve the texture of ice cream.[21]

Most success stories have been in drug development. The first approved treatment for HIV, sold as azidothymidine (AZT), was derived from a sea sponge, as was remdesivir, the first treatment for seriously ill covid-19 patients.[22] Halaven, an anti-cancer drug that has annual sales of over $300 million, also has its origin in a sea sponge.[23] With the global marine biotechnology industry expected to reach a valuation of $6.4 billion in 2025, there is growing interest in the commercial potential of new discoveries from remote, extreme environments on the high seas – whether from the deep abyss of the Pacific Ocean or the ice-covered Arctic.[24]

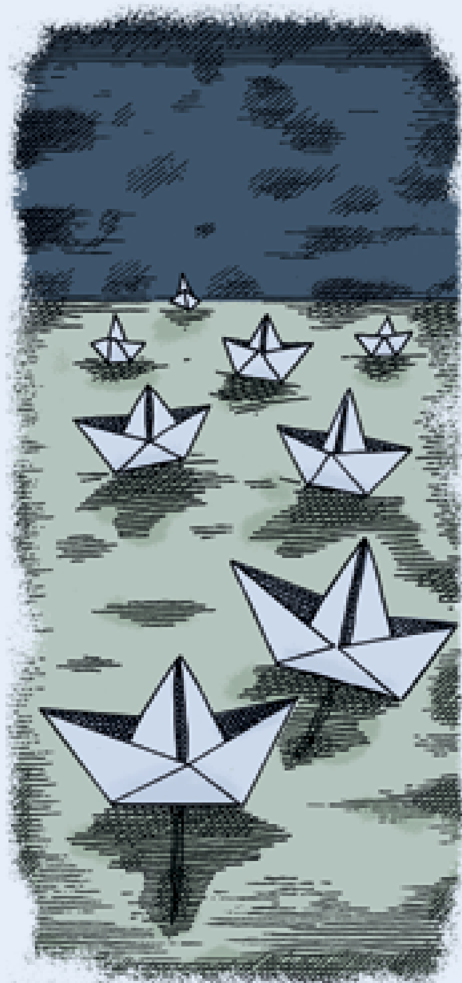
The new treaty will present challenges for those collecting high seas genomes and using them to develop patents, be they research scientists or private corporations. There will be regulatory hurdles, but also more interest and activity. One reasonable expectation is that there will be new requirements to document the collection and storage of physical samples taken from the high seas, as well as an obligation to make genetic information from samples easily and freely accessible in digital format online.

Pharmaceutical and chemical industries acquiring high seas genetic material for use in patented products will need to understand the origin of the source material and will need to do due diligence in ensuring its collection and use is fully compliant. A comparable example might be the onus on large retailers such as Walmart or Waitrose to ensure that the seafood they sell has been harvested legally and without the use of forced labour.

> *"With the signing of the High Seas Treaty, there is a genuine opportunity."*

18 Ibid
19 Girguis and Holden (2012), *On the Potential for Bioenergy and Biofuels from Hydrothermal Vent Microbes*
20 New York Times

The pay-off for adherence to these rules will be increased social standing among consumers, an important consideration in a world where corporations' sustainability standards are under scrutiny. Indeed, it is conceivable that future products derived from the high seas, whether antibiotics or skin cream, could be subjected to external ethical review and offered appropriate labelling for compliance. With the signing of the High Seas Treaty, there is a genuine opportunity, right now, to expand deep sea discovery and to explore ocean genomes as a sustainable, lucrative and equitable enterprise to benefit humanity.



TAMING THE WILD WEST

The high seas are often considered a lawless realm. The truth, however, is rather more nuanced. A suite of organisations, bodies and codes of conduct oversee specific activities offshore. For instance, the International Seabed Authority, an autonomous UN body, governs the nascent industry of deep-sea mining; the International Maritime Organisation (IMO) regulates shipping; 17 regional bodies oversee high seas fishing; and the International Cable Protection Committee (ICPC) governs the use of international telecommunications and power submarine cables.

One crucial provision of the High Seas Treaty, and a compromise in getting it passed, is that it can't undermine these authorities or restrict their activities. New, but not existing, fisheries, for example, would need to assess their environmental impact. The treaty can, however, nudge these sectors towards greater environmental compliance in the longer term.

Of existing high seas activities, shipping is the most tightly regulated. But it, too, operates under its own rules, which become laxer, and less frequently enforced, with distance from the land. In part, this is because monitoring and enforcement is easier close to shore. Complicating matters is the fact that, on the high seas, flag states – the primary authority for vessels at sea – enforce various levels of adherence to international regulations. At the extreme end are 'open registers', states that will register vessels from any nation looking for benefits such as lower tax rates and looser compliance with safety and environmental standards. According to one analysis, as much as 73% of the global fleet is flagged to a country other than that of the vessels'

21 Naing and Kim (2019), *A brief review of applications of antifreeze proteins in cryopreservation and metabolic genetic engineering*
22 Heffernan (2023), *Stemming the Threat of Biopiracy on the High Seas*
23 Ibid
24 Smithers report on The Future of Marine Biotechnology to 2025

beneficial ownership.[25] When it comes to environmental protection, this is concerning. It becomes even more so when one considers the international shipping fleet is ageing, posing a growing threat to the ocean.

Let's take, as an example, an environmental incident in international waters. The flag state of the vessel should, in theory, be held responsible, but this doesn't always happen in practice. A case in point is the Sanchi oil spill, to date the worst tanker spill of the twenty-first century. The incident happened on the afternoon of 6 January 2018, when the oil tanker *Sanchi* – flagged to Panama, owned by Iranians and crewed by Iranians and Bangladeshis – collided with the Chinese cargo vessel *CF Crystal* 185 miles off the coast of Shanghai, in the East China Sea. The tanker caught fire, exploded and sank to the seabed, killing all 32 of its crew and spilling over 100,000 tons of condensate, a light, highly combustible crude oil. While most of the condensate burned off, some entered the ocean, creating a slick the size of Paris on the high seas.[26] In the aftermath, an investigation concluded that both *Sanchi* and *CF Crystal* failed to keep look-out. While all parties involved agreed to take measures to avoid a similar incident in the future, no one was held accountable for the lives lost or the environmental damage.

With the new treaty, shipping companies will come under mounting pressure to ensure their fleet is seaworthy, whether by changing their design or operations or both. There will be more scrutiny of flag states to check that their vessels are fit for purpose and trained by competent staff. There will likely be changes to international shipping routes too, to accommodate newly designed MPAs on the high seas. The High Seas Treaty comes at a time when the global shipping fleet is also facing the need decarbonise. In addressing the dual challenge of protecting

"As much as 73% of the global fleet is flagged to a country other than that of the vessels' beneficial ownership. When it comes to environmental protection, this is concerning."

25 Inomics
26 Chen et al (2020), *Marine oil spill pollution causes and governance: A case study of Sanchi tanker collision and explosion*

"With the new treaty, shipping companies will come under mounting pressure to ensure their fleet is seaworthy."

the climate and the ocean, the sector has a historic opportunity to adapt, and to chart a course for a more sustainable future.

For the time being, the fate of the high seas still hangs in the balance. But in redressing our 'out of sight, out of mind' relationship with the offshore ocean, the new treaty is an exciting opportunity to consider how we can use our ocean in ways that protect the planet and benefit the majority. It is humanity's first serious attempt to tame the wild west of our planet, that blue frontier of the high seas. ●

NOT CRICKET

CRICKET HAS LONG SEEN ITSELF AS EMBODYING THE SPIRIT OF FAIR PLAY AND SPORTSMANSHIP. But betting scandals over recent decades have exposed a murkier reality. The game needs to restore integrity and trust. Clear, robust governance would help.

ELEANOR MORIARTY

Responsible Investment Associate

CRICKET ISN'T EVERYONE'S CUP OF TEA. IN THE WORLD OF SPORT, IT STANDS OUT FOR TWO THINGS. First, the game is complex. There are nine different ways for a batter to get out, and Wisden's book of the 42 laws of the game runs to over 200 pages. Furthermore, new formats of cricket have proliferated in recent decades, each with its own particular rules and regulations. Even the most devoted fans struggle to keep up.

Secondly, cricket has long prided itself on its integrity and fair play. Sir Pelham Warner, one-time captain of England, wrote: “The very word ‘cricket’ has become a synonym for all that is true and honest. To say ‘that is not cricket’ implies something underhand, something not in keeping with the best ideals.” Ironically, he was writing before the notorious bodyline series of 1932-1933, which sparked a diplomatic row after England’s fast bowlers targeted the Australian batters’ bodies, rather than their stumps. Warner was the team’s manager.

FALL FROM GRACE, LOSS OF TRUST

The truth is some cricketers have always been prepared to resort to sneaky ploys to gain an edge.

But the sport was truly shaken to its foundations by an incident at the turn of the millennium. Throughout the 1990s, Hansie Cronje was the captain and poster boy of South African cricket. He was even courted by Nelson Mandela, who used the colonial games of rugby and cricket to cement the bonds of the new rainbow nation through shared pride in multi-racial sporting prowess.

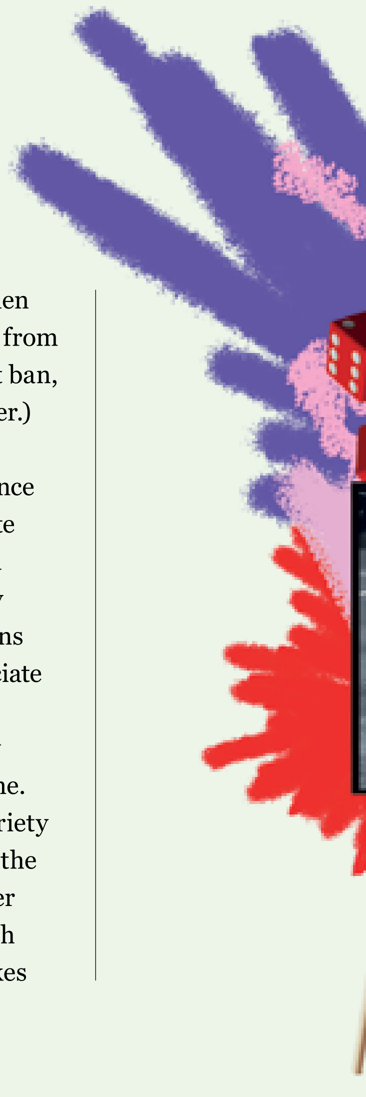
Then, in April 2000, Cronje was charged with match-fixing: accepting bribes from Indian bookmakers to lose games intentionally.

> “Perhaps these scandals should have come as no surprise. If cricket’s laws are complex, so too is the game’s governance.”

Cronje’s fall from grace was total. When he eventually confessed, he was banned from cricket for life. (Tragically, it was a short ban, as he died in a plane crash two years later.)

But the scandal also cast doubt on the whole future of the professional game. Once you lose trust that all players will compete to the best of their ability, why would you spend good money to go and watch? Why would television companies spend millions to secure coverage – or sponsors to associate themselves with players?

And the trust wasn’t just lost in every game, but in every moment of every game. Cricket is blessed with a bewildering variety of statistics. Punters can bet not just on the outcome of the match, but on the number of runs made by a team or a batter, which batter will be out next, which bowler takes



most wickets. You can even wager on the coin toss at the beginning of the match, or whether a team opts to bat or bowl first.

In 2010, after a newspaper exposé of illegal betting, two Pakistani bowlers and their captain were found to have conspired to bowl no-balls (illegal deliveries) at pre-determined points of the game. This sort of illegal betting on a segment of the game, rather than its result, is known as spot-fixing. All three were banned from cricket for years and received prison sentences after a criminal investigation.

A QUESTION OF GOVERNANCE

Perhaps these scandals should have come as no surprise. If cricket's laws are complex, so too is the game's governance.

Cricket was originally run from London by the Marylebone Cricket Club (MCC), which to this day retains responsibility for – and copyright to – the laws of cricket. For many years, it also ran England's national team.

Nowadays, the global game is run by the International Cricket Council (ICC), which governs international competitions for all forms of the game, like the world cups, and appoints the umpires and referees.

However, international matches between two nations are managed by their respective cricket boards, which are also responsible for running all domestic competitions at every level of the game. And there is a massive financial imbalance between these national cricket boards. Cricket is like a religion in India, and the wealth of the Board of Control for Cricket in India (BCCI) dwarfs its counterparts, even in the traditional cricketing strongholds of England and Australia, giving it massive clout within the game. This level of decentralisation makes it

easier for bad actors to take advantage of chinks in the governance armour, akin to regulatory arbitrage in the corporate world.

Complicating matters further, betting is illegal in some nations on the Indian subcontinent. That has helped spawn a massive and murky bookmaking black market, which is hard to investigate.

MUCKING OUT THE AUGEAN STABLES

After the Cronje scandal, the ICC established its Anti-Corruption and Security Unit (ACSU), led by an ex-Metropolitan Police Commissioner. During the early years, the ACSU was seen as underfunded and ineffective. It doesn't help that its jurisdiction is limited to international fixtures, only investigating or monitoring domestic leagues when it is invited to do so.

The ACSU really kicked into gear after the Pakistani spot-fixing crisis. Since then, it has undoubtedly helped clamp down on match fixing in international matches. The players are now paid enough to be less susceptible to bookies' enticements, and there are strict rules on dressing room conduct and access, as well as in-depth training for players on the potential pitfalls.

Certainly, the game has not gone into decline. Far from it: a range of new national competitions with different formats and more razzamatazz has attracted a younger, wider audience. At the same time, women's cricket has surged in popularity, attracting more participants, television contracts and money.

CRYPTO FRIGHT

A surge in popularity, baffling complexity, a proliferation of innovative products, a smattering of devious behaviour, sketchy governance: the parallels won't be lost on anyone familiar with the cryptocurrency arena. Of course, before crypto became seen as a low-effort path to a Lamborghini, a large part of its appeal was precisely that it was beyond the control of governments and central banks that were seen as incompetent or corrupt, imperilling the value of fiat currencies.

But the lack of regulation left the door open for bad actors. Just as less experienced cricket players may be groomed by bookies to fix matches, retail investors – typically less financially literate than their institutional counterparts – may be more susceptible to market manipulation, misinformation or outright fraud. Regulators, especially in the US, have woken up to the need for robust governance frameworks around the cryptocurrency ecosystem. FTX 'Crypto King' Sam Bankman-Fried and, more recently, Binance founder Changpeng Zhao have been found to have exploited the lack of governance controls and compliance oversight of their cryptocurrency exchanges.

A TIMELESS TEST

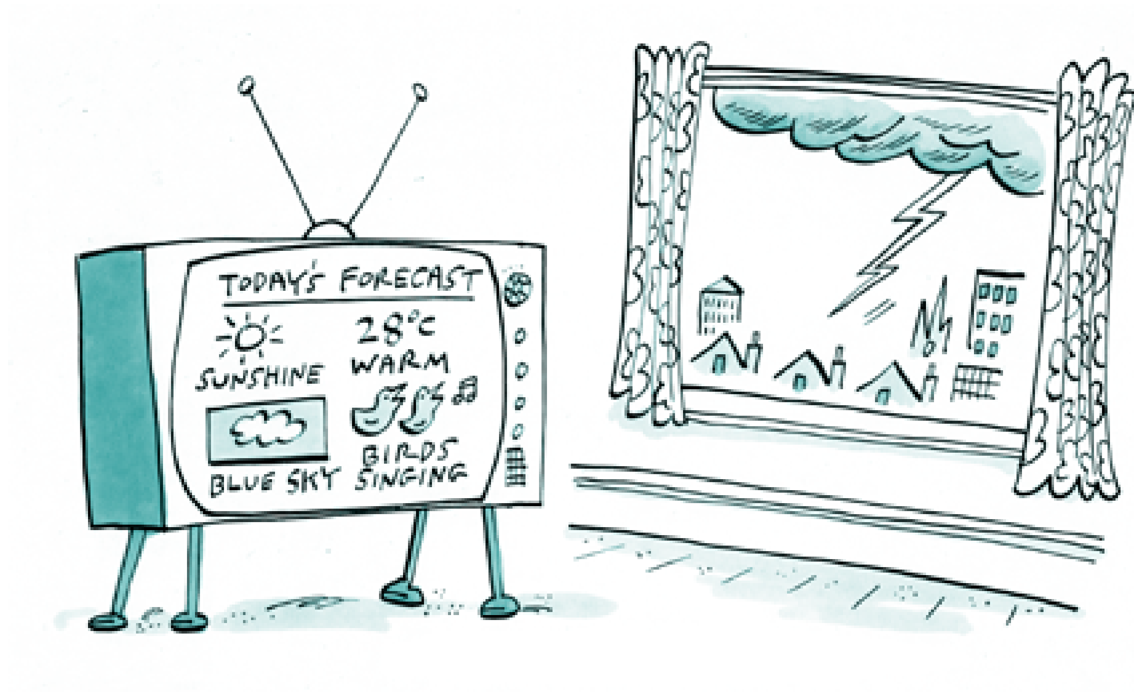
In any collective human undertaking, there will always be a tension between those who play by the rules and those who game the system. Cricket is no exception. Robust governance and strong management is key to both rooting out any malpractice and fostering the integrity which should underpin fans' and players' trust in the game.

"But the lack of regulation left the door open for bad actors."

Something new under the sun

FORECASTING IS A THANKLESS ENDEAVOUR.
But it's necessary – for investors and meteorologists alike. Last year, preparing portfolios for something which would have subsequently been declared 'out of the blue' proved futile as markets were buoyed by free-flowing liquidity and stronger economic growth. So is it time to abandon the forecast?

Emphatically, no. Novelties have emerged in the financial system which heighten the risk of a crisis and could amplify market moves in the event. These emergent features – the new things under the sun – are yet to be tested. When they are, investors will once again blame it on the weatherman.



Cartoons by Robert Thompson robertthompsoncartoonist.com

HENRY MAXEY

Co-CIO

"EARLIER ON TODAY, APPARENTLY A WOMAN RANG THE BBC AND SAID SHE HEARD THAT THERE WAS A HURRICANE ON THE WAY. Well, if you're watching, don't worry, there isn't."

Those were the infamous words of British weather forecaster Michael Fish, a few hours before the Great Storm of 1987. In 2023, our forecast that slowing economic growth and a deterioration in liquidity conditions would lead to a hurricane in financial markets was an error in the opposite direction – a severe weather warning but no storm. Instead, we saw strong growth from a surprise positive

fiscal impulse. And this was accompanied by improved liquidity because of how that fiscal expansion was funded.

The Ruffer portfolio is built to deliver positive performance in all market conditions. Last year's error was not the decision to prepare portfolios for a sharp change in the weather, but our selection of the assets held to drive returns if skies remained blue. So what of tomorrow's weather?

The focus of this article is squarely on liquidity – an important pillar in the theory that informs our portfolio construction, but not the only one. First, I'll briefly recap how liquidity dynamics developed in 2023. Then I'll explore the emergent novelties in the financial system which heighten the risk of a liquidity crisis and could amplify its severity.

Liquidity can mean different things in different contexts. Here, we use liquidity to describe the purchasing power available to a current or prospective asset owner within the financial system.

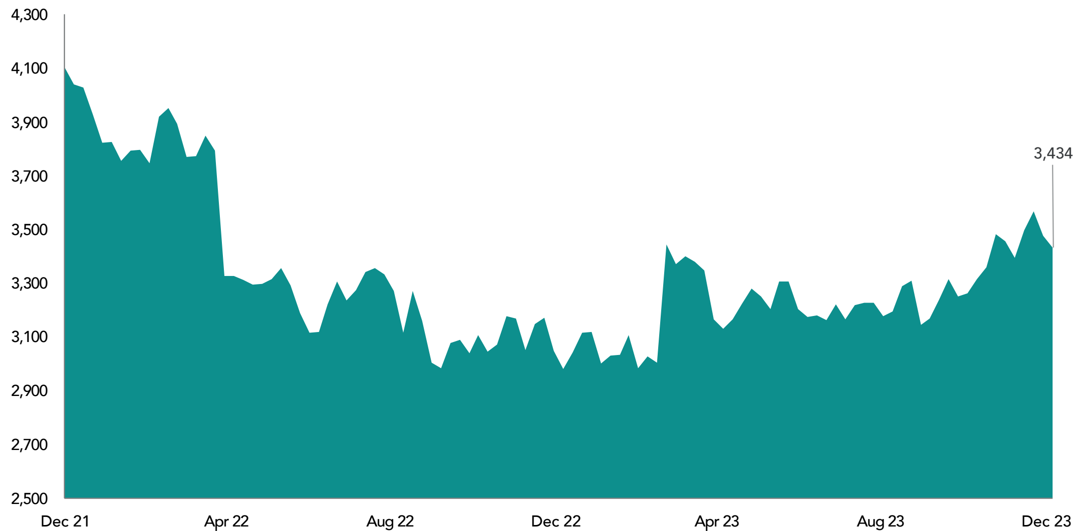
LIQUID LUCK?

Despite massive inflows into money market funds out of bank deposits and despite ongoing quantitative tightening (QT), the reserves of the US banking system (and leverage of the financial system) increased in 2023, rather than decreasing as we expected.

Reserve cash balances within the Federal Reserve (Fed) system is our current proxy for liquidity conditions in financial markets (Figure 1). It directly affects the aggregate financial sector balance sheet. In early 2023 – alongside those bank reserves – there were $2.5 trillion dollars in the Fed's reverse repurchase programme (RRP) facility. The RRP had become so large because it represented the best and safest cash return for investors. When an alternative asset – Treasury bills (issued by the US government to fund its fiscal expansion) – offered a better return, money poured out of the RRP into reserve balances. This increased liquidity in financial markets and enabled investors to re-leverage. This is a possibility again in 2024. But, if the Fed chooses to flood the system with more liquidity, it would significantly increase the likelihood of further inflation volatility, creating the type of environment I described in the 2022 Ruffer Review.

So has danger been averted, or merely postponed?

Figure 1
RESERVE BALANCES HELD WITH THE FED $BN



Source: US Federal Reserve

A TIGHT SQUEEZE

Our answer is that it is postponed.

Why can't this benign free-for-all continue? For two main reasons: the mechanics of liquidity tightening reasserting themselves; and asset preferences of money market funds returning to the Fed's RRP facility. The latter is most likely to happen when markets anticipate imminent rate cuts, and Treasury bills of short duration yield less than the rate on the RRP.

QT – which sucks money out of the system – remains the Fed's preference. Meanwhile, there's danger in an exhaustion of the re-leveraging of financial markets, which has been so supportive of liquidity. Why? Because many investors have their portfolio risk exposure governed by volatility or allocate to risk based on trends in asset prices. Once portfolios have adjusted to the upper end of their risk limits (which is a self-reinforcing dynamic because the re-risking tends to reduce volatility and support price trends), markets become vulnerable to a reversal.

Our concern is that the reversal will have more in common with 1987 than any of the other crises in the last 30 years. But to suggest markets are prone to a 1987-esque crash is not to say we have designed a portfolio solely geared towards that outcome. As those factors which made 2023 benign go into reverse, they will do so from a starting point of extremely compressed risk premia, extended investor positioning, buoyant sentiment and more fragile fundamentals. Our investment philosophy guides us towards owning assets on the other side of these dynamics whilst acknowledging ever-present (and ever-changing) opportunities to make money in different parts of the market.

Danger is heightened today as a result of some emergent features of the global financial system – the new things under the sun – which have not been properly tested and could amplify market moves. I'll consider these novelties in turn: 'run to RRP' risk; the emergence of multi-strategy hedge funds using stop-loss risk management; the rise of zero days to expiry options (0DTE) markets; the continued migration of derivatives to central counterparties; and algorithmic market making.

"Our concern is that the reversal will have more in common with 1987 than any of the other crises in the last 30 years."

Figure 2
A RISK PARADOX

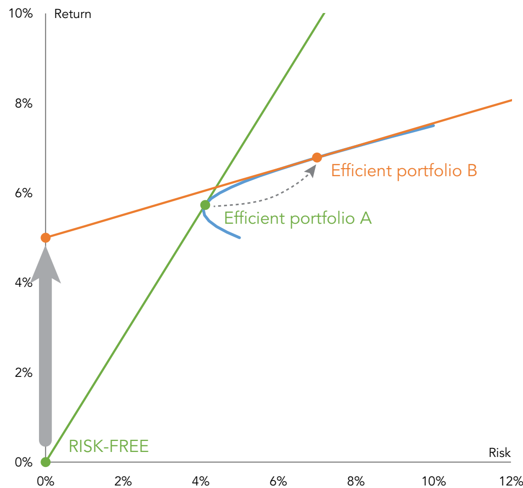
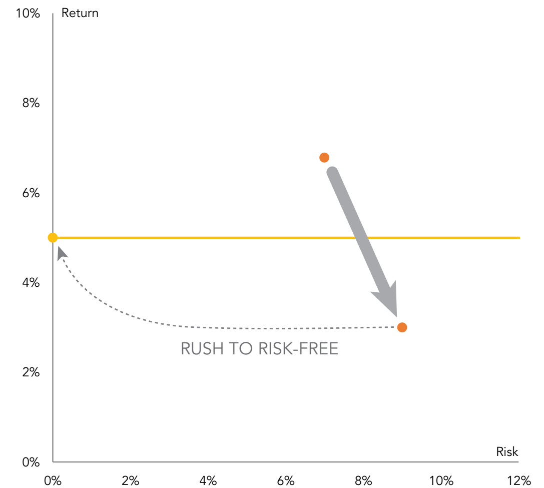


Figure 3
DASH TO CASH



Source: Ruffer, Bloomberg

'RUN TO RRP' RISK

The RRP facility was introduced to allow the Fed to raise interest rates in a post quantitative easing (QE) and excess bank reserves world. It provides a riskless, 'administered' interest rate – where the yield doesn't fall as demand for the facility rises. The rate is set five basis points above the lower bound of the Fed's interest rate band, which will look very attractive when investors start to fear the downside in risky assets again and bid up the price of riskless T-bills.

One way to conceptualise this run risk is to consider some textbook risk-return charts.

Figure 2 shows how, for a given efficient frontier, a rise in the risk-free rate can push investors into a riskier portfolio (with a worse risk-return trade off). This holds until risky returns drop below the risk-free rate, at which point the optimal allocation is 100% cash – illustrated by Figure 3. There's a tipping point beyond which the dash to cash becomes self-reinforcing. Central banks would probably cut interest rates in the event of any serious financial stress, but the aggressive rate cuts needed are likely to be reactive, not pre-emptive.

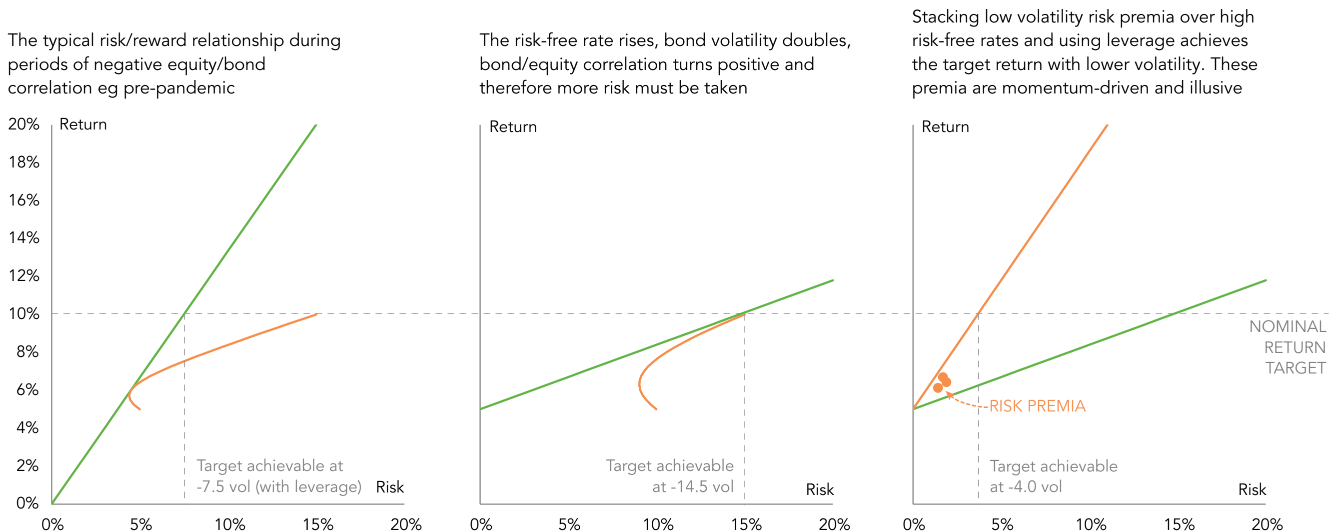
POD SHOPS AND COPYCATS

The multi-strategy hedge fund model is becoming a victim of its own performance success. This model allocates capital across lots of independent portfolio manager 'pods'. It then fillets out unwanted risks, leverages up and aggressively manages the capital allocation across those pods, using stop losses. Long-run historic performance for these funds, especially the blue-chip ones, has been eye-wateringly impressive.

This approach to asset management also looks attractive in a world where bonds no longer act as an offset to equities. As Figure 2 showed, a rising risk-free rate and high bond price volatility can force investors to seek return much further out along the risk spectrum. If this is too uncomfortable, then an alternative is to hold cash plus some leveraged risk premia strategies, a practice known as yield stacking.

> "The clients carry all the risk and most of the costs."

Figure 4/5/6



Source: Ruffer, Bloomberg

After bonds', growth stocks' and 60:40 portfolios' terrible time in 2022, it should be no surprise that yield stacking and diversified risk premia strategies like multi-strategy hedge funds seemed attractive options in 2023.

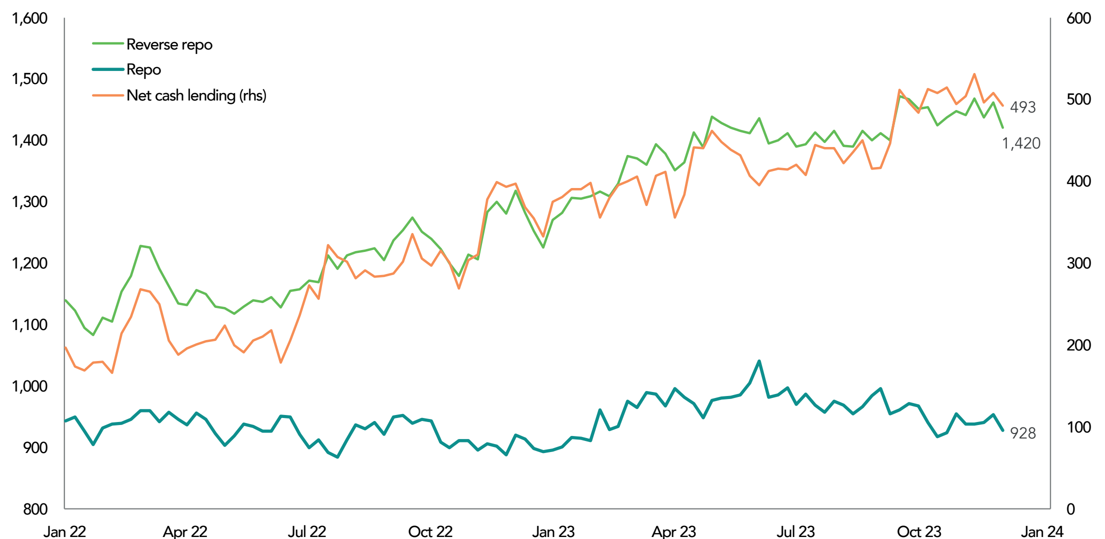
As a result, these strategies now collectively manage between $300 billion and $600 billion, which is, on average, leveraged three to five times. To keep up with the growth, there has been aggressive competition for talent and aggressive increases in fees. This includes the notorious pass-through model, which can lead to performance fees being paid to individual pods even when the overall fund has not generated a positive performance.

This has become a massive moral hazard machine. Individual portfolio managers are incentivised and expected to max out their risk budget in the hope of collecting performance fees. When strategies don't work or traders get stopped out, they can generally find another seat at another fund without too much difficulty. The clients carry all the risk and most of the costs. It is the reincarnation of Wall Street's proprietary trading desks in asset management, with upside-down incentive structures, without the same regulatory oversight and with ill-fated stop loss risk management.

To illustrate the regulatory blind spot, the Office of Financial Research in the US did a pilot study on the opaque, $1.4 trillion non-centrally cleared bilateral repurchase agreement (NCCBR) market, which is used primarily by hedge funds to leverage their trades. It found that over 70% of Treasury repo in NCCBR was transacted with zero haircut – ie the theoretical leverage available to buy US Treasuries was infinite.

The net cash lending by NCCBR primary dealers (Figure 7) is a good proxy for the leverage demands of hedge funds. It increased by about $300 billion in 2023.

Figure 7
LENDING BY PRIMARY DEALERS, $BN



Source: Federal Reserve Bank of New York

> “It would not surprise me if multi-strategy hedge funds were similarly vilified after the next crisis.”

Some of the strategies employed by these players, such as dispersion trading, have become crowded. In an unwind, they could turn a low correlation, low volatility market into the inverse very fast. Something akin to this happened in August 2007 – a fire sale liquidation of quantitatively constructed portfolios which revealed a systemic risk in this part of the hedge fund industry.[1]

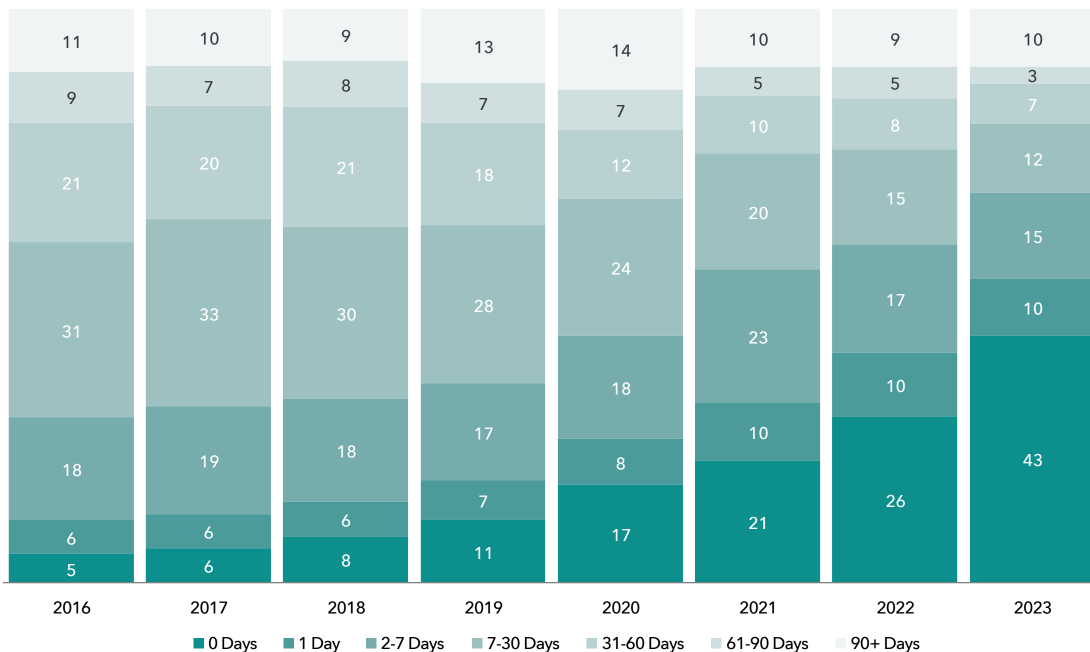
Portfolio insurance – a dynamic hedging strategy based on stop losses which was designed to let pension funds hold a higher equity allocation ‘safely’– was deemed the villain of the 1987 crash. It would not surprise me if multi-strategy hedge funds were similarly vilified after the next crisis.

ZERO DAYS TO EXPIRY OPTIONS (0DTE)

These are options contracts which are opened and closed within the same day. Figure 8 shows the enormous growth of interest in these options over the past few years.

Figure 8

TIME TO EXPIRY OF S&P 500 OPTIONS %



Source: Chicago Board Options Exchange

1 Khandani and Lo (2007), *What happened to the quants in August 2007?*

There seems to be little clarity or agreement on who exactly does what within this market. Its advocates say it allows for more specific hedging of, or speculation in, event risks, thereby providing greater flexibility and more complete markets. Detractors say it is just a casino for all those with post-covid stock market gambling addictions.

Those who can see all the details of the activity (such as the CBOE) seem to be comfortable there is nothing to be afraid of; the net exposures are low, they say.

Naturally, that makes me nervous. And it seems to have caught the eye of financial stability watchers at the European Central Bank (ECB), who said this in a recent report:

"Some characteristics of 0DTE options might, however, increase procyclicality in the equity market. The smaller premia paid for options with a shorter time to expiry mean the effective leverage embedded in these contracts is much higher. This can magnify their impact on the underlying stock market because of the way exposures are managed by option sellers. Some traders only hedge their position after breaching a certain loss threshold."[2]

Note another stop loss behaviour within intraday options.

My concern is less that this ecosystem is risky now, per se. It is more how it will interact with other parts of the market during a period of stress. The potential for toxic combinatorial chemistry worries me most. For example, during financial stress different players may seek to use this market to lay off risk, disrupting the market's normal balance. Or stress could change the behaviour of existing players in the market.

"The potential for toxic combinatorial chemistry worries me most."

CENTRAL COUNTERPARTIES AND MARGIN REQUIREMENTS

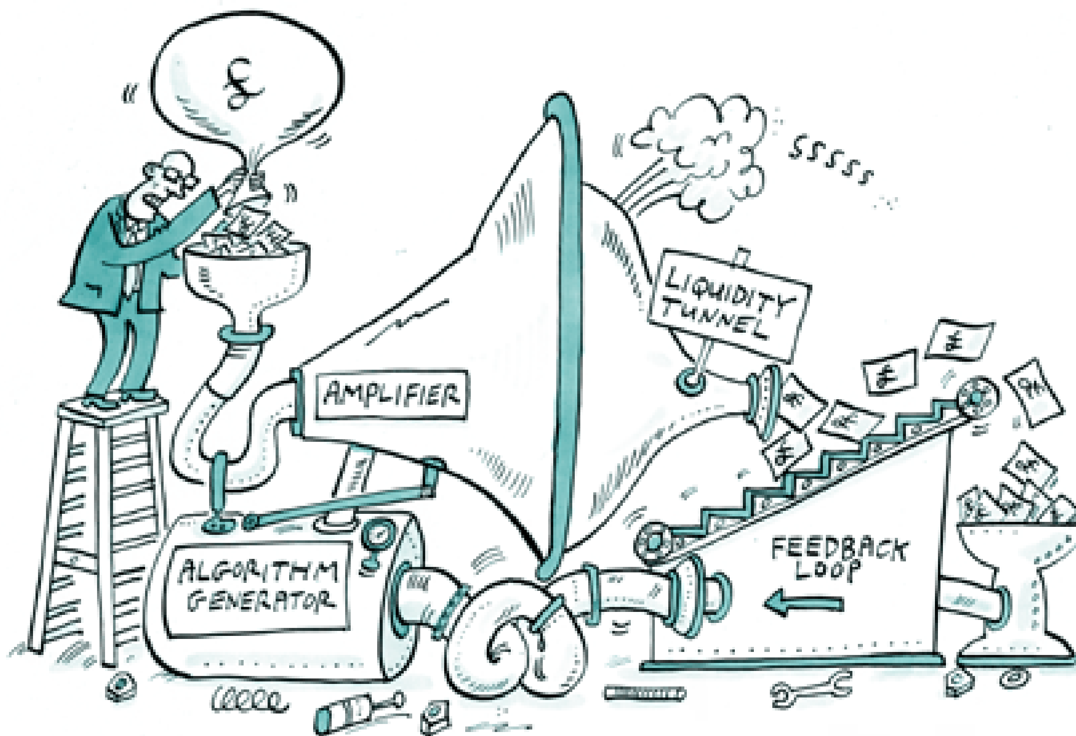
Since the 2008 financial crisis, there has been a push to move as much bilateral derivatives business – eg interest rate swaps – as possible onto central counterparties (CCPs) in order to reduce counterparty credit risk concerns in stressed markets. These efforts have introduced different risks. In particular, margin requirements tend to be pro-cyclical, meaning they can increase during periods of market stress. This can create a liquidity squeeze, as market participants need to sell assets quickly to meet margin calls.

2 ECB Financial Stability Review, November 2023

ALGORITHMIC MARKET MAKING

We have already seen algorithmic market making fail under stress. It has attracted some scrutiny but remains a feature of markets. Algorithmic market making improves liquidity when markets are operating normally but detracts from liquidity in tail events. In 1987, the withdrawal of specialists from the market during the crisis meant the quoted NYSE stock index was not based on live prices for all its constituents. This made arbitrageurs reluctant to step into the basis – the difference in price between the cash market and the futures market – which had opened up between the futures exchange in Chicago (where there was heavy selling of index futures by portfolio insurance funds) and the underlying equities on the New York Stock Exchange.

Once the arbitrageurs stepped back, liquidity worsened, which exacerbated the falls and increased the dysfunctionality. If liquidity provision disappears when markets behave unusually, you have an amplification mechanism – and one which is much faster than human specialists. In the modern age, as we saw in the case of Silicon Valley Bank, runs happen far faster than was ever imagined in the past.



AMPLIFIERS

The common thread running through all these developments in financial market architecture is that they are likely to amplify short-term liquidity squeezes and price volatility. This matters because a lot of money is managed systematically these days, with risk asset exposures scaled mechanically according to volatility and price trend signals. And, if you include money which is not run systematically but is effectively governed by backward looking volatility-based risk metrics, that probably accounts for the majority of the asset management industry. So, if liquidity, correlation and volatility become an amplified feedback loop and this disrupts price trends, enormous selling flows can be unleashed. And today flows seem to matter more than fundamentals.

Mike Green at Simplify has done some work to show that, when ETFs' and passive index vehicles' share of an index rises above 40%, the market shifts from being driven by fundamentals (eg earnings) to being driven by flows. The market becomes pro-cyclical. In this scenario, in-flows tend to benefit the largest, most liquid and currently most crowded names in an index. And vice versa.

Fans of the HBO series *Chernobyl* will recognise what I am describing as a 'closely coupled system'. That is, one in which the components or elements are tightly linked together. In such systems, changes or disturbances in one part quickly and directly affect other parts. In our financial application, the system is complex, tightly integrated, interdependent and highly sensitive to liquidity conditions. Crucially, it predominantly sits outside the banking system, where much of the post 2008 crisis regulatory focus has been.

People often think financial catastrophes occur because herds of humans panic when the emotional pendulum swings from greed to fear. The next market sell-off will be much more mechanical, mathematical, precise and fast. Regulators and policymakers, meanwhile, are human – their reaction times are slower, with decisions made by committees.

> "Algorithmic market making improves liquidity when markets are operating normally but detracts from liquidity in tail events."

> "People often think financial catastrophes occur because herds of humans panic when the emotional pendulum swings from greed to fear. The next market sell-off will be much more mechanical, mathematical, precise and fast."

A BOLT FROM THE BLUE?

For most people these days, the 1987 crash is a faded memory or just a market meme. Asked to describe what happened, the vast majority would cite portfolio insurance as the root cause. Some might recall the notable macro features of the time, such as the big trade deficit, the sharp rise in interest rates and the weak dollar. Those close to the coalface might remember some of the proximate events: a data release revealing a larger trade deficit than forecast; proposed curbs on tax breaks for company acquisitions during the corporate raider era; the British Petroleum initial public offering; and an attack on a US oil tanker in the Persian Gulf.

Few, I imagine, would discuss the regulatory compromises which had emerged over years of squabbling between the different regulatory authorities as Chicago and New York battled for dominance of futures markets. Or that the influence of portfolio insurance had been increasingly evident in markets in the years preceding, particularly the violent movements in the final 'witching hour' of trade on the days futures and options contracts expired.

The 1987 crash was not a bolt from a blue sky due to a single, clumsy portfolio management mechanism. It was the culmination of many innovations and evolutions in a system architecture which ultimately proved to be catastrophe prone and had already provided many clues to this vulnerability.

Today's market participants consider the introduction of circuit breakers – ie the pause or closing in trading after the market has fallen by a specific amount – the post 1987 regulatory innovation likely to prove most effective at preventing a rerun.

S&P 500 CIRCUIT BREAKERS

LEVEL 1

Triggered if the S&P 500 index falls 7% from its previous close. Trading is halted for 15 minutes, provided this occurs before 3.25pm (Eastern Time). If the drop occurs after 3.25pm, trading will not be halted.

LEVEL 2

Triggered if the S&P 500 index falls 13% from its previous close. As with Level 1, trading is halted for 15 minutes if this happens before 3.25pm and is not halted if the drop occurs after 3.25pm.

LEVEL 3

Triggered if the S&P 500 index falls 20% from its previous close. Trading is halted for the remainder of the day, regardless of when the decline occurs.

“The 1987 crash was not a bolt from a blue sky due to a single, clumsy portfolio management mechanism.”

Interestingly, despite the numerous post-crash studies and enquiries (notably the Brady Commission report), few recommendations were agreed upon. Circuit breakers were one, but there was real scepticism at the time whether they would actually help.

When so much money is systematically managed – directly or indirectly – circuit breakers can buy a little time for policymakers to try to figure out what is going on. But they can also exacerbate moves. For example, I wonder how many traders of 0DTE options know what price their option will be settled at if the market closes down 20% on a circuit breaker? Is it -20%? Or the price of the index at the open the following day – ie potentially a lot lower?

Spoiler: -20% is not the right answer.

> "Today, I see a closely coupled financial system sensitive to pro-cyclical liquidity in which the largest investors tend to want to move in the same direction at the same time."

Imagine what this uncertainty does to selling flow as the market threatens closure.

In her brilliant book on the 1987 crash, *A First-Class Catastrophe*, Diana Henriques described the Brady report conclusions as follows: "It wasn't about market prices; it was about market power – unprecedented market power, capable of derailing the financial engines of the country. All that was required was for a significant portion of the world's biggest and wealthiest investors to move in the same direction at the same time."

Today, I see a closely coupled financial system sensitive to pro-cyclical liquidity in which the largest investors tend to want to move in the same direction at the same time.

As we found in 2023, liquidity is hard to pin down and harder still to forecast accurately in time. But, over time, we can have more confidence. The conditions which made 2023 so benign can easily persist into 2024, propelling markets even higher. Some even predict 2024 markets will be protected by pre-election politics and the deep state motivation to keep Trump out of the White House. Perhaps.

And there are levers that can be pulled to keep liquidity supportive. But markets don't tend to dance to political tunes for sustained periods, and liquidity will eventually tighten, through QT or balance sheet mechanics. Then, the risk will be an amplification to the downside.

In the UK, the mood music to the financial crash of 1987 was the Great Storm, an event which defied the weather forecasters. The storm was caused by an extratropical cyclone rather than a more easily forecastable tropical hurricane, and what made it so fierce was a small area of highly intense wind known as a sting jet.

We don't know exactly when the next sting jet of illiquidity will hit markets but, when it does, the financial storm will be declared 'shocking' and 'out of the blue'.

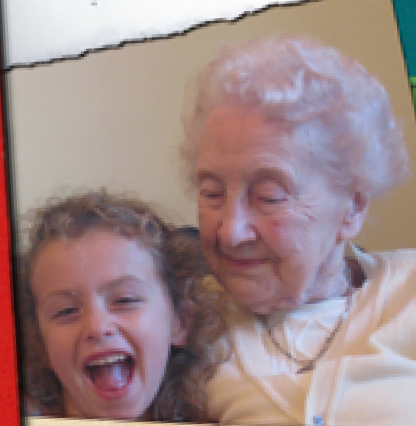
We have been surprised by how long it has taken to happen, but we want to ensure portfolios are not caught short when it does.

In the meantime, we will remain cautious in our allocation to risk and opportunistic in our return-seeking forays and resolve to do a better job for clients in 2024.

> “We don’t know exactly when the next sting jet of illiquidity will hit markets but, when it does, the financial storm will be declared ‘shocking’ and ‘out of the blue’.”

A FEW GOOD CHOICES

"You Boys don't



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IFF CITY POLICE
Raid Precautions
ertify that
Newby
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ISAAC NEWTON SAID, "IF I HAVE SEEN FURTHER IT IS BY STANDING ON THE SHOULDER OF GIANTS."

At five foot one, my grandmother wasn't a conventional giant. But she's helped me see further, and better. And helped me in my own way to make better decisions.

CHRIS BACON

Chief Executive

MY GRANDMOTHER, ZENA NEWBY, WAS BORN IN 1917, GREW UP WITH LITTLE, WAS FORMED BY THE GREAT DEPRESSION – AND HAD THE STORIES TO BOOT. Early-morning dashes to the toilet in the back yard. A girl in the school playground so poor she'd ask Zena for the core of her apple. In home economics lessons, potatoes were peeled with precision – and the peelings were weighed – to ensure minimal waste.

My Nan lived all her 95 years in Grangetown, a short walk from Cardiff docks. She married in August 1939 and, on the final day of their honeymoon in Torquay, Britain declared war on Germany. My grandad worked for the Port Health Authority in a 'reserved occupation', which made him exempt from military service. But he was having none of it. "If my brothers are fighting, I am too." And off he went.

Newly married Zena didn't see him for three years. She spent the war-by-day as a shorthand typist; she spent the war-by-night as an air raid warden, enforcing blackouts and sounding alarms. At some point towards the end of the war, she contracted tuberculosis. After months in a sanitorium, there seemed no hope of recovery. Her family moved her to a home a few streets away that had (only from the front bedroom, and only partially, and only until the builders started work opposite…) a view of the sea. This was to be the long-term spot for her long-term convalescence and limited mobility.

Yet Zena had other ideas. She volunteered to be part of a trial testing "a wonder drug from America". The drug was streptomycin… and the rest is (oral family) history.

Zena made a full recovery. The war ended. Her husband returned. But starting a family proved an easier thing to want than to do. After the pain of many unsuccessful pregnancies, my mum was born, in 1954.

Jump ahead to the early 1980s, and two grandsons arrive – my brother and me. Two boys for Zena to spoil rotten with Welsh cakes and pikelets and Cadbury Twirls. Two boys with central heating and inside toilets who'd never hungered for apple cores. Two boys who, in her phrase, "don't know you're born".

"THIS IS ABSOLUTELY THE WORST CAREER DECISION YOU COULD EVER MAKE."

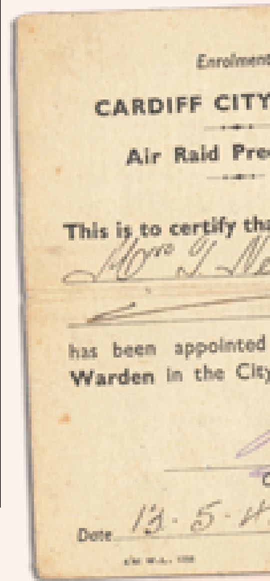
I moved from London to Cardiff in 2008. Zena was 89 then, and had lived for a decade alone.

My mum, an only child, and an alcoholic, died aged 40, when I was 12. Four years later, my grandad also died, of what we all knew to be a broken heart.

(There's a mask of a paragraph, one that doesn't touch the edge of the suffering. And there's a word – alcoholic – that would be unprintable if Zena were alive, because of the pain-shame complex, a complex that left much understood but unspoken.)

So it's 2008. I've bought my first house, with my New Yorker wife, in a city a long way from Kansas. We've got two young kids, in a season of life full of nap times and teething and beakers and car seats.

On the plus side, we're now just a few minutes' walk from Zena, and from her home that had long since lost its view of the sea. Less good – we're 156 miles from my work, which is a three-hour walk-train-tube journey away, in the City of London.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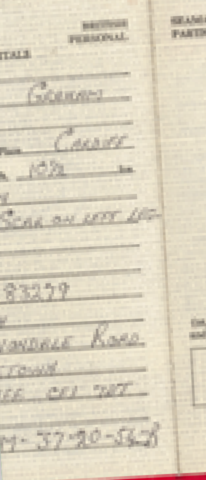
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NEWBY
CARDIFF

Every Monday, I'd be up at 4.25am to reach a distant desk by 8.15am. Every Thursday, I'd return, catching the first super-off-peak train from Paddington, arriving home hours after the kids were asleep. Fridays, I had special dispensation to do something then-wacky, called working from home.

I lasted 15 months. Yes, Nan, I know – it was much easier than dodging the Blitz, and I should be glad to have a good steady job, and to be home every weekend, and with enough left over after paying the mortgage. But I married for love, and I like the kids, and it's too much apart.

My boss at the time was a chief investment officer, based in Zurich. Our conversation went something like this: "I can't keep going like this." "Well, Chris, we don't want to lose you." "OK, here's my suggestion…"

And at the end of the meeting, he said: "I'm happy to support you. But before deciding, know this is absolutely the worst career decision you could ever make."

His comment was meant well; it sounded wise and right. And like a lot of career advice, it turned out to be totally wrong.

The arrangement we came to saw me cut my job in two. I recruited and trained someone for one part of the role. I kept the other part, working on a pay-as-you-go deal. This included a trade that turned out nicely for me: a Swiss-franc-linked income, on a Cardiff cost of living.

I set up an office in Zena's box bedroom. We'd have lunch together daily, wonderfully content in each other's company, chatting about life, and things she'd read that morning in the Daily Mail.

My own working time was also split roughly in two. Half was spent on work for my former employer. Liberated from organisational drag, I was free to focus on things I felt made the most difference. Having to submit an invoice every month, and account for my time, provided excellent discipline. My ratio of meetings to impact felt high, and being part-in, part-out of the company gave me a different perspective. With no long-term goals or forward ambition, my work – you could almost call it a career – ascended for the best part of a decade.

"His comment was meant well; it sounded wise and right. And like a lot of career advice, it turned out to be totally wrong."

With the other half of my time, I was free to explore and experiment. The cost of living was taken care of. So where might things lead?

I like serendipity, autonomy and optionality. I don't like being constrained. And so this set-up was near-perfect for me. I did some conventional consulting for a mix of clients. I joined a branding agency. And did some teaching. And launched a smartphone app – an app we thought was going to conquer the world, but didn't even conquer a car park.

"THAT SEEMS LIKE AN AWFUL LOT OF MONEY."

This being an investment publication, it is now time we come to Zena Newby and an illustration of a concept my friend and colleague Shaheen Zaman loves to talk about: skewness in stock returns. He has the data and charts; I'll tell you a story.

From the early 1960s, Zena worked as a secretary for British Road Services, later renamed the National Freight Corporation. In 1982, the company was sold to its employees, becoming one of the first of the UK's state-owned firms to be privatised. My Nan invested some of her savings. And then, for the next several years, she put 100% of her weekly wages into the employee share-ownership scheme.

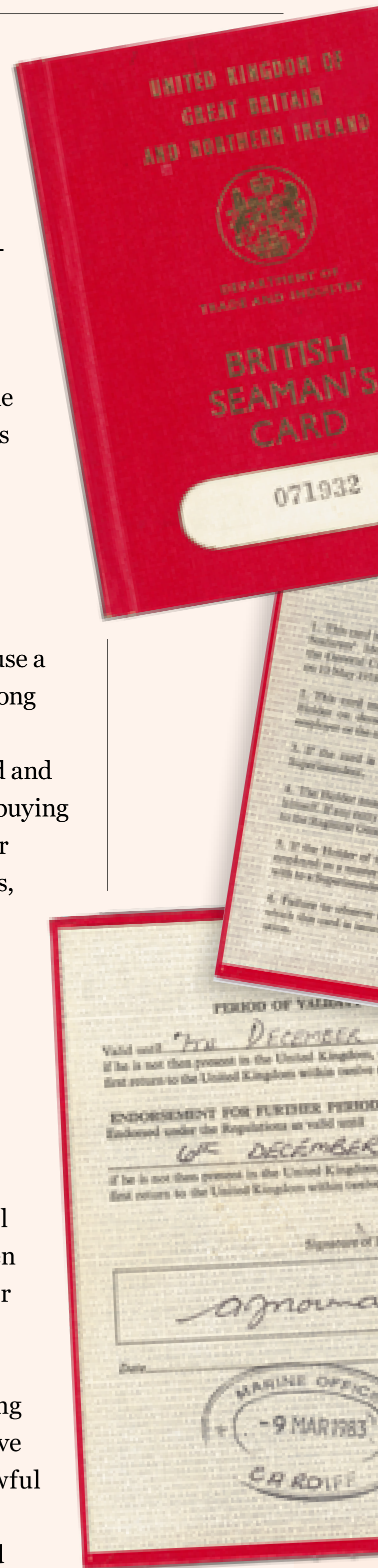
The company was listed in London in 1989, changed its name again and later merged with a similar firm to become Exel Plc, a logistics business with operations in North and South America as well as the UK. In 2005, Deutsche Post bought Exel for £3.6 billion, in a transaction that caused a head-scratching smile for a soon-to-be-great-grandmother.

> "I like serendipity, autonomy and optionality. I don't like being constrained."

Zena kept all her financial records in a battered suitcase in a cupboard under the stairs, half-hidden by coats. Inside the suitcase were batches of share certificates and paper statements – "it's too soon to throw that one away" – all recorded in a maroon notebook. The notebook was as battered as the suitcase, with page after page of crossing-out and updating, all tracked in blue biro. Occasionally, she'd use a calculator, but her preference was to do long multiplication in the margins.

Through the 1980s, Zena, my grandad and tens of thousands like them had started buying shares as Britain privatised. Most of their investments began with a B – British Gas, Airways, Telecom, Petroleum – though I remember some Marks & Spencer and Tesco in the notebook as well. Over the years, their share prices went down as well as up; they paid dividends; and over the next few decades, as a group, they produced what Zena felt were decent investment returns.

But one investment eclipsed them all – Exel, née British Road Services. When the letter on the Deutsche Post takeover arrived, she couldn't quite believe her own maths. Her shares, steadily accumulated 20 years earlier, were being purchased for a sum that seemed to have too many digits. "That seems like an awful lot of money." The proceeds – to come from Deutsche Post in cash, shares and loan notes – totalled 70 times what she'd



paid for her house in 1944, and at least four times what that same house was worth the month the letter arrived.

By temperament, Zena would have been a natural Ruffer client. She loved safety and resilience, disliked permanent losses and mainly wanted to sleep well at night.

In practice, her pattern of gains looked more like those of a venture capitalist or entrepreneur than a shorthand typist – just one investment accounted for the bulk of all her returns.

"LOOK WHO I'VE BROUGHT TO SEE YOU."

In 2012, my wife was pregnant with our fourth child – a daughter, Cordelia, who's now the middle child of seven. Professionally, I was living happily ever after. Still enjoying the autonomy and optionality and my lunchtimes with Zena – until her health took a turn for the worse. She went into hospital; pneumonia set in.

Cordelia was born on the first Sunday of that November. We sneaked her into Zena's ward a few days later, and Zena died peacefully the following morning.

A few years later, Ruffer came knocking. I'd known the firm, liked what I'd seen and the people I'd met. After some good back and forth, I decided to join, mainly because I was curious.

In following that curiosity, I've ended up doing a job I enjoy. Doing a role Zena would mostly understand, and quietly be proud of.

"her pattern of gains looked more like those of a venture capitalist or entrepreneur than a short hand typist"

> "In 58 years of Berkshire management, most of my capital-allocation decisions have been no better than so-so... our satisfactory results have been the product of about a dozen truly good decisions – that would be about one every five years."
> –Warren Buffett

A market miscellany

SOPHIE JAMIESON
Senior Associate – UK Institutional

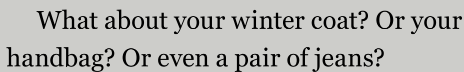
CHARLOTTE MACKAY
Senior Associate – Private Wealth

WILL JUDGE
Research Associate

Investment pieces

"IT'S AN INVESTMENT PIECE." THIS WELL-WORN JUSTIFICATION FOR OUR MORE PRICEY SARTORIAL SELECTIONS MAY BE BECOMING MORE TRUTH THAN SELF-REASSURING FICTION.

Firstly, what makes a purchase an investment? The distinction between 'consumption' and 'investment' boils down to the buyer's expectation of realising some future financial value from the purchase. We can think of it in terms of utility and expected future value. Your family home scores highly on both. A KitKat only scores highly on the former, a share in a company only on the latter.



What about your winter coat? Or your handbag? Or even a pair of jeans?

Quickly we enter the realm of heuristics and mental accounting. We might think of the cost per wear or make back-of-an-envelope calculations about the depreciation of the alternatives we haven't bought. A 2023 TikTok phenomenon dubbed this sort of mental accounting 'girl math'. But there may be something more revealing to it than that.

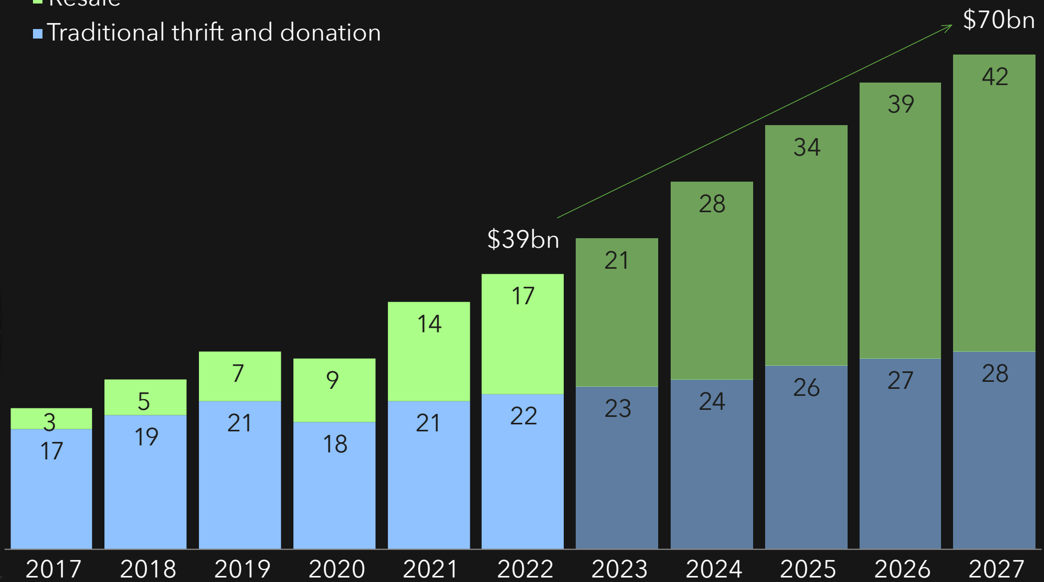
The surge in resale and second-hand shopping trends, dominated by younger generations, is causing a seismic shift in consumer spending habits. Second-hand clothing retail is forecast to double by 2032, capturing 18% of the total US apparel market. This growth is being facilitated by online resale businesses like Vinted, Vestiaire and Depop, which enable individuals to sell their seldom-worn items seamlessly to buyers around the world.

In a similar vein, the emergence of high-end clothing rental platforms – through companies like HURR or By Rotation – present the prospect of making your money back on an item in just a few rental arrangements.

Today, an estimated 82% of Gen Z consider an item's resale value before making a purchase, compared with 58% of consumers overall.[1] Sustainability is the most commonly cited reason for the rise of resale, but perhaps it's the introduction of investment psychology – where our spending habits are being increasingly shaped by these newly acquired selling habits – that matters most of all.

SOPHIE JAMIESON

Senior Associate – UK Institutional

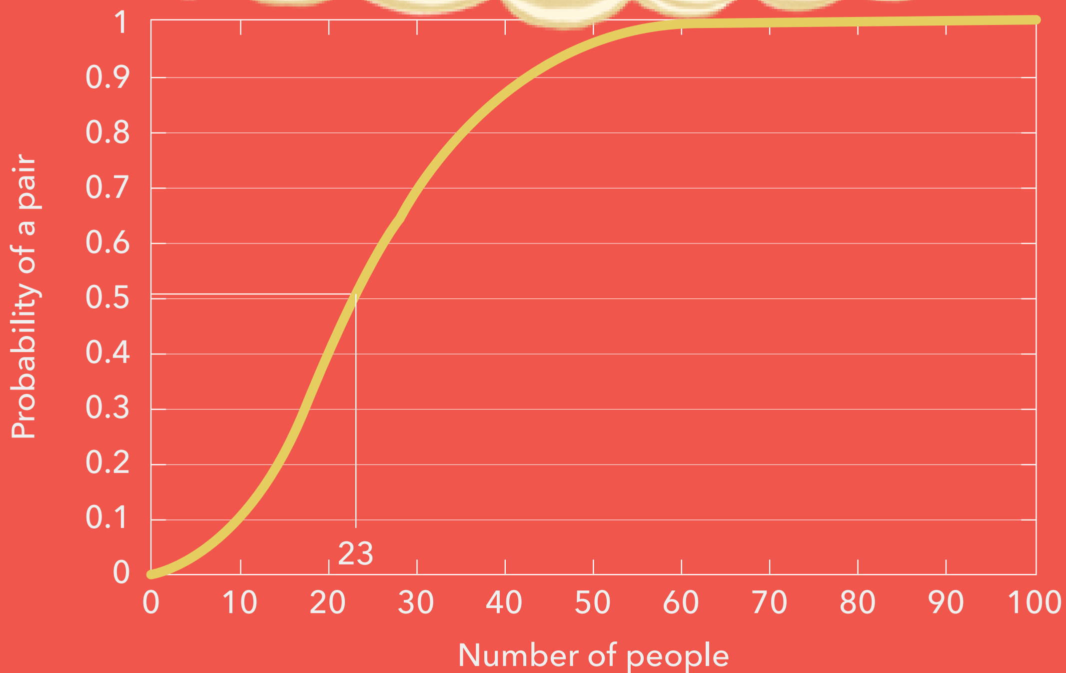


"The surge in resale and second-hand shopping trends, dominated by younger generations, is causing a seismic shift in consumer spending habits."

1 ThredUp 2023 Resale Report

Source: GlobalData 2023

Happy Birthday to you, too



GROUP SIZE AND THE PROBABILITY OF TWO PEOPLE SHARING A BIRTHDAY

"Investors are much worse at assessing probabilities than they think they are."

STRANGE, ISN'T IT? THAT QUIET DELIGHT WE FEEL ON LEARNING WE SHARE A BIRTHDAY WITH SOMEONE ELSE. That their diary has a red X on just the same page as ours, that you pedal through the seasons in tandem – a rare kinship. But how rare?

Put differently: how many people would need to be in a room together for there to be a 50% chance that two of them share the same birthday?

The starting point for most of us might be something like this: there are 365 days in a year. My birthday is one out of 365 – so there's a pretty slim chance the person beside me has the same. Maybe add 100 people. That still only gets us to three months' worth of days. Hmm.

Our mental shortcuts – or heuristics – don't get us very close.

Mathematicians, however, fare better. They've discovered what's known as the birthday paradox. It states that you need a group of just 23 people to have over a 50% probability that two of them share the same birthday. And in a room of 75 there's a 99.9% chance of at least two people matching. Fewer people than you expected?

There are a couple of reasons why this number surprises us, and they reveal why investors are much worse at assessing probabilities than they think they are.

Firstly, we tend to think of the question from an individual perspective: how many people would I need to be in a room with for one of them to share my birthday? It's much more difficult for us to compute and account for the experience and perspectives of others.

In this group, there are 23 people, each of whom needs to compare dates with 22 others. If we consider all these possible comparisons (22 + 21 + 20 + 19 + 18 and so on), we find there are in fact a total of 253 opportunities for shared birthdays. Not just the 22 match-ups for us personally.

Secondly, exponents aren't intuitive. Our brains are great at linear calculations – add, subtract, multiply, divide – but not so good with exponential or logarithmic calculations. Compound interest rates are a fine and familiar example – at a 5% interest rate, an investor would double her money in 14 years, not the 20 years our linear minds might assume. That makes any equation requiring a calculation of n^{253} quite tricky.

Investment decision making, in its crudest form, is about assessing the probabilities of a range of outcomes. The lesson from the birthday paradox is that our instincts for likelihoods may be even less accurate than we'd imagined.

CHARLOTTE MACKAY
Senior Associate – Private Wealth

Lying flat or standing up to youth unemployment?

YOUTH UNEMPLOYMENT IS A GROWING CONCERN AROUND THE WORLD. In almost every country, the rate of unemployment among 15 to 24 year olds has been climbing and is higher than for the adult workforce as a whole.

Among the main reasons for the recent steep rises: covid-19. Anyone leaving education during the pandemic faced the nightmare of finding a job during lockdown. In addition, the economic shutdowns particularly affected the services sector, one of the key employers of young people. But what can be done?

The Chinese authorities chose a novel approach. In June 2023, the official young adult unemployment rate in China reached a record high of 21.3%, up from less than 10% in May 2018 – and many suspect the real figure was far higher still. So Beijing simply stopped publishing a separate youth unemployment rate.

This does nothing to fix the problem. Many young have become 'full time children', dependent on their parents and often paid to do household jobs. Two other terms have become widespread since 2021: *tang ping*, or 'lying flat', signifies the young's rejection of the rat race; and *bai lan*, or 'let it rot', reveals a darker despair at the mismatch between their attainments and what the labour market has to offer.

The Chinese authorities could do worse than look across the East China Sea to Japan, currently at the bottom of the table (with 4.2%), despite similarly dire demographics. Japan suffered a slump in youth employment after its economic bubble burst in the 1990s, creating the *shushoku hyogaki sedai*, or 'employment ice age generation'. The damage was long-lasting: many of the ice age generation, now in their forties, are still not in stable employment.

Eventually, the Japanese government took responsibility and instituted several youth employment policies in 2003, with a full Youth Employment Promotion Act following in 2015. Judging by the table, that's a job well done.

CHARLOTTE MACKAY
Senior Associate – Private Wealth

"*Bai lan*, or 'let it rot', reveals a darker despair at the mismatch between their attainments and what the labour market has to offer."

Source: OECD, National Bureau of Statistics of China

Flatpack furniture: AI's final frontier

OPENAI'S RELEASE OF CHATGPT IN 2022 WAS A WATERSHED MOMENT IN THE TECHNOLOGICAL REVOLUTION. At last, we could all access generative artificial intelligence (AI) and glimpse into the future. Crucially, it meant we could judge for ourselves whether once faraway fears of robots taking our jobs were now a doorstep reality.

Large language models (LLMs) are learning quickly and achieving impressive results. GPT-4 scores highly in the most demanding academic tests, passing the bar examination and SATs with room to spare. There's growing evidence to suggest machines can do almost everything humans can, but better, faster and more cheaply. Almost everything.

AI and robots still fall short when it comes to simple tasks which are second nature to most humans, like entering a home and making a cup of coffee or assembling flatpack furniture – the Ikea test, in robotics parlance. This is Moravec's paradox, formulated as long ago as the 1980s: whilst computers are generally good at well-defined tasks such as playing chess, they struggle when a process relies more on contextual judgement.

Why is this surprising? Moravec argues that humans are 'prodigious olympians' in perceptual and motor skills, thanks to a billion years' accumulated experience of such tasks. By contrast, reasoning is perhaps less than 100,000 years old, and we're still learning how to do it efficiently. So we think it's harder than it is – and have always rewarded it accordingly.

What does this mean for the future of work?

Historically, technological advances have mostly affected manual labourers, taking their jobs first in agriculture and then in manufacturing. The question is whether this time is different. Many of the tasks performed by white collar professionals are more at risk from AI-based automation than the sensorimotor, judgement and perception tasks done by midwives or builders.

> "But, when it comes to Allen keys, humans still have the edge."

Nevertheless, not every part of a professional's job can be automated, and it remains unlikely that one machine could take over the entirety of a role. Many white collar roles involve both specialised and non-specialised tasks. Lawyers, for example, require in-depth knowledge of the law as well as clear communication skills and critical thinking.

Industries' increased focus on innovation and development in AI and robotics, at least in the short term, is also likely to create jobs for highly skilled segments of the labour force – particularly for those with experience in data science or other quantitative disciplines.

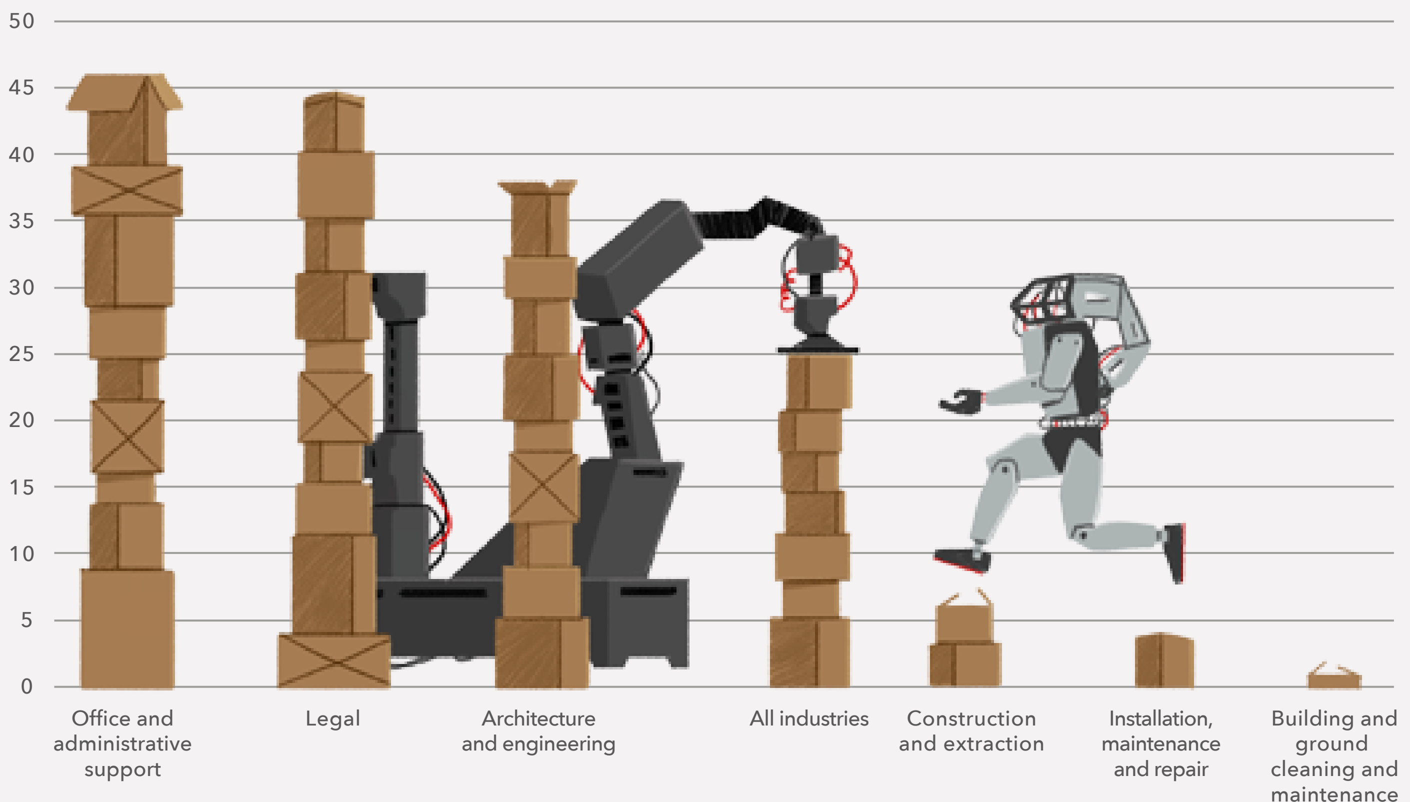
So machines may be closer to solving the apparently intricate and complex reasoning problems laid out in Alan Turing's famous test for machine intelligence. But, when it comes to Allen keys, humans still have the edge.

The working world is in flux but for now, at least, AI can be both a boon and a bane for the professional workforce.

WILL JUDGE

Research Associate

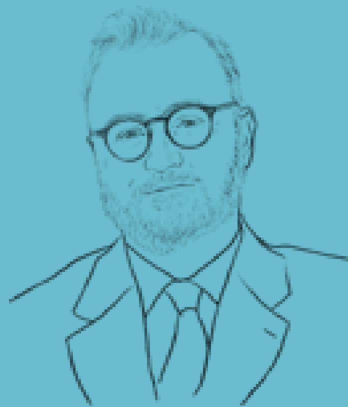
SHARE OF US INDUSTRY EMPLOYMENT EXPOSED TO AI AUTOMATION



Source: Goldman Sachs

WHAT THE HELL IS WATER?

CHINA'S DECISION TO DEVALUE ITS EXCHANGE RATE IN THE MID-1990S CREATED A NEW GLOBAL MONETARY SYSTEM. Over the past three decades, governments and central banks acclimatised to these changed waters. But a new monetary order is emerging to which investors will need to adapt if they are to keep on swimming.



RUSSELL NAPIER

is a financial market strategist and researcher. He co-founded the investment research portal ERIC and is the author of The Solid Ground, a fortnightly newsletter focused on global macro trends. Russell's 2005 book Anatomy of the Bear: Lessons from Wall Street's Four Great Bottoms *has become an indispensable title to students of financial history. In 2014, he founded the charitable venture The Library of Mistakes – a business and financial history library headquartered in Edinburgh, now with branches in Europe and Asia.*

IN HIS COMMENCEMENT SPEECH TO THE STUDENTS OF KENYON COLLEGE IN 2005, THE NOVELIST DAVID FOSTER WALLACE EXPLAINED HOW "THE MOST OBVIOUS REALITIES ARE OFTEN THE HARDEST TO SEE AND TALK ABOUT." He illustrated this observation by relating the story of the old fish who, while swimming along one day, meets two young fish. The old fish says, "Morning, boys. How's the water?" The two young fish swim on. Then one looks over to the other and asks, "What the hell is water?"

For those seeking to preserve and grow the purchasing power of their savings, the most obvious reality that is not talked about is the structure of the global monetary system. For almost 30 years, all fish – young, old, and those who started that period young but are now old – have been swimming in peculiarly disturbed water. We don't discuss it, for the same reason Wallace's young fish don't discuss it: because we have known nothing else. That is about to change.

"FOR ALMOST 30 YEARS, ALL FISH – YOUNG, OLD, AND THOSE WHO STARTED THAT PERIOD YOUNG BUT ARE NOW OLD – HAVE BEEN SWIMMING IN PECULIARLY DISTURBED WATER."

THE 'NON-SYSTEM'

That investors misunderstand the water that is the global monetary system is evident from their focus on the latest emanations from the US Federal Reserve (Fed). The Fed is important, but it has adapted to swim in the water established by decisions made in China and elsewhere in Asia in the 1990s. In 1994, China devalued its exchange rate and then refused to allow it to appreciate. By 1998, most other Asian countries had followed suit. The decisions to prevent the appreciation of these exchange rates created a new global monetary system that Paul Volcker referred to in his 2018 memoir *Keeping at it* as 'the non-system'. But it was a 'non-system' in name only; it was as important in determining interest rates, inflation, economic growth and asset price returns as previous global monetary systems, such as the gold standard or the Bretton Woods system. What follows is an explanation of how political decisions taken in Asia in the 1990s have distorted economic outcomes and asset price returns and why that system is ending, as well as some thoughts on how the new system will develop and the consequences for investors.

Any central bank that is determined not to permit the appreciation of its exchange rate creates local currency to purchase foreign currency. The central bank pursuing exchange rate targeting is then in possession of foreign currency, which it invariably invests in government bonds. Think of this as a form of quantitative easing but one in which the local currency created by the intervening central bank results in the accumulation of the government debt of other nations. For example, the People's Bank of China (PBOC) created renminbi (RMB) via commercial bank reserves – the form most central bank money takes – and exchanged these mainly for US dollars, which were invested primarily in US government bonds.

DISTURBED WATER

The PBOC was agnostic as to the price it paid for the government bonds of other nations as it accumulated and invested foreign currency at a rate determined by the condition of its external accounts. This intervention directly distorted exchange rates, the quantity of money in the domestic economy, the level of interest rates and the availability of credit of developed world economies and, as we shall see, indirectly distorted much more. From 1998 to 2014, China's foreign exchange reserves grew by $3.8 trillion. Over the same period, the foreign exchange reserves of Asia ex-China grew by $3.0 trillion.[1] That is a lot of disturbed 'water', and it is a disturbance to which households, corporations, financial institutions, governments and central bankers have all, to differing extents across the globe, had to adapt. We now live in a world which has been built upon the 'most obvious reality' that this is the way things will always be, because this is the only way we have known them to be.

1 World Bank

EXCHANGE RATE MANAGEMENT

The external accounts of any country are referred to as 'the balance of payments' because, when an exchange rate adjusts freely, these accounts balance. However, when exchange rate management is in place, the balancing item in the balance of payments is the adjustment in the country's foreign exchange reserves. The greater the external surplus, the larger the rise in a country's foreign exchange reserves, the more foreign government bonds it acquires, and the more domestic currency bank reserves it creates. In the 'non-system', foreign reserves grew particularly quickly as China and other countries managing their exchange rates ran surpluses in both current and capital accounts. China limited the scale of capital outflow by its citizens but welcomed capital inflows, exacerbating the size of its capital account surplus.

BUYING UP BONDS

The undervaluation of China's exchange rate also boosted capital inflow as it attracted direct investment by foreign companies seeking to reduce their costs of production. China's capital account surplus, added to its current account surplus, turbocharged the growth in foreign exchange reserves and foreign currency bond holdings by the PBOC. The 'non-system' was thus set up to transform the developed world's stock of savings flowing into China into more RMB liquidity and even higher holdings by the PBOC of foreign government bonds. In previous global monetary systems, there had been legal or practical limitations to the scale of cross-border capital flows, but the 'non-system' had no such fetters. The movement of this stock of savings to China, to the extent that it added to the pace of reserve accumulation by the PBOC and others, further distorted the global supply of money and credit.

DISCOUNTING THE FUTURE

For investors, the most important distortion was that exchange rate intervention by Asian central banks acted to decouple interest rates from growth rates across the developed world. At the core of asset price valuation is a discounted cash flow calculation. Using a current interest rate (often the yield on government bonds), analysts discount the value of all the future cash flows of an investment to establish the net present value of these cash flows. The faster these cash flows grow, the greater their present value. The lower the discount rate, the higher the present value of future cash flows. In a particularly rapidly growing economy, investors expect, unless there is a major surge in productivity, inflation to rise as economic growth rises. In such a system, there is a limit to the gap between the discount rate and the nominal growth rate and also a range of probable outcomes for the net present value of discounted future cash flows.

But what if there was a buyer for government bonds that paid no attention to the rate of growth in the economy and the likely consequences for higher inflation? In such a situation, the discount rate need have no relation to the growth rate of the economy and expected inflation. A much larger gap between the discount rate and the growth

"AT THE CORE OF ASSET PRICE VALUATION IS A DISCOUNTED CASH FLOW CALCULATION."

"THE ABILITY OF BUSINESSES AND HOUSEHOLDS TO ADJUST TO THE NEW 'WATER' DEPENDED VERY MUCH UPON THE SOCIO-POLITICAL ENVIRONMENT IN WHICH THEY OPERATED."

rate of cash flows would be possible, and the net present value of such cash flows would rise. It is no coincidence that, following the devaluation of the RMB in 1994, the valuation of US equities began to rise. The cyclically adjusted price earnings (CAPE) ratio of the S&P 500 – a measure of value relative to earnings that attempts to adjust for the cyclicality of corporate earnings – surpassed its October 1929 level of 33x CAPE by the end of 1997. It continued to rise to a new all-time high of 43x in March 2000. In Q1 2024, the S&P 500 remains elevated at 31x.[2] While many reasons were given for this rise in valuations, the key was that investors had come to believe the growth rate of cash flows could remain high, perhaps permanently, while the discount rate could remain low. That reality was a consequence of decisions taken by Asian central banks, not the Fed or other developed world central banks.

FINANCIAL ENGINEERING

The ability of businesses and households to adjust to the new 'water' depended very much upon the socio-political environment in which they operated. US corporations, which operated with relatively few restrictions, responded to this new system by adding ever higher levels of debt and outsourcing their manufacturing capabilities to countries, such as China, undervaluing their exchange rates. The US non-financial corporate debt-to-GDP ratio jumped from 55% in 1994 to 73% in 2008 and is at 77% today.[3] An increasing amount of the new debt was used to gear up existing income streams from assets rather than create assets with new income streams, and this so-called financial engineering was well rewarded when the discount rate decoupled from the growth rate. Blue collar America was left to adapt to the exodus of jobs to countries acting to undervalue their exchange rates. The wealth gap between asset owners with white collar jobs and blue collar workers with no assets grew and grew. The 'water' of the global monetary system had huge real-world impacts, particularly in the US. In other societies, corporations were not as free to move their manufacturing capabilities, fire people or engage in financial engineering. The freedom of US corporations to adapt to the realities of this global monetary system produced high levels of corporate profitability in the US which, when combined with rising equity valuations, produced very good returns for the S&P 500.

CREDIT CUSHIONING

The other side of this price agnostic flow of newly created capital into the developed world bond markets is what happened to the newly created money in China and elsewhere in Asia. Those schooled in the operation of the gold standard or the Bretton Woods system would expect this excess money to ultimately produce high levels of inflation which would, over time, undermine competitiveness. This decline in competitiveness would have produced a deterioration in the external accounts of these countries and, eventually, a tightening of liquidity that would create an economic slowdown. However, inflation in Asia also remained low in the 'non-system'. The

2 Bloomberg
3 International Monetary Fund

excess money created by the PBOC funded a major expansion in bank credit, but China's state-owned banks ensured this credit was focused on funding increased production rather than increased consumption. With the state-owned banks funding Chinese capacity expansion with cheap credit, China's investment boom went on, keeping prices low both in China and across the globe. Elsewhere in Asia, households and corporates lived in the shadow of the Asian financial crisis of 1997 and did not respond to the availability of cheap credit by borrowing. The creation of ample liquidity in China and elsewhere in Asia thus did not produce the higher inflation that would have led to a rebalancing of external accounts, higher interest rates and slower growth.

RATIONAL EXUBERANCE?

The Fed often questioned, sometimes out loud, what was happening. As early as December 1996, Fed Chairman Alan Greenspan wondered at the 'irrational exuberance' in the US stock market without realising the rationality of high equity valuations when the discount rate and the growth rate decouple. In 2005, Greenspan pondered why US bond yields were falling while he raised short-term interest rates. What he hadn't assessed was the impact from price insensitive buying of his government bonds by Asian central bankers at a time when undervalued exchange rates continued to send a wave of disinflation to US shores that also supported government bond prices. Ben Bernanke, the man who was to succeed Greenspan, attributed this decoupling of the US growth rate and the discount rate to the 'Asian savings glut' without reference to the role Asian exchange rate management had in transforming Asia's external surpluses into purchases of US treasury securities. Perhaps they really did not realise what was going on, but the bottom line is they ultimately adapted their own monetary policy to ensure deflation was avoided and any collapse in asset prices that would damage financial stability was resisted. The Fed's actions were crucially important, but they were reactions – the driving force behind monetary policy was Asian exchange rate intervention policies. Developed central banks may have been independent but they independently adjusted their own policy to the new global monetary system established by political decisions in Asia.

CHANGE TO EXCHANGE

For China, the policy of managing its exchange rate no longer delivers positive economic outcomes. There is growing evidence of an internal deflation in China at a time when the country's external accounts are deteriorating markedly. If the PBOC now has to intervene to support the exchange rate, the result will be the selling of foreign government bonds and a contraction in RMB bank reserves – a tighter monetary policy which will exacerbate deflationary pressures. The country's external accounts seem likely now to force the PBOC to intervene to support the RMB or accept a devaluation. China's current account surplus is much smaller, relative to GDP, than it has been, and recent contractions in exports may reflect structural problems

> “For China, the policy of managing its exchange rate no longer delivers positive economic outcomes.”

as foreigners diversify their supply chains. Meanwhile, the country’s capital account has moved into deficit as foreigners have been liquidating both their RMB denominated portfolio assets and even their direct investments. The more these adjustments are driven by structural changes associated with a growing cold war, the more difficult it will become for China to maintain a stable exchange rate and grow the economy. China’s total non-financial debt-to-GDP ratio is at a record high of 308%, well above the US level of 252%. With deflation evident and debt to GDP rising, China cannot

accept an exchange rate management policy which finally, due to a deficit in its external accounts, restricts its ability to grow.

If China continues to target its exchange rate, it is likely to have to endure the form of debt deflation associated with economic contractions that turn into depressions. Even the unelected president of China is unlikely to force such a form of economic adjustment upon his people. We cannot know when China will abandon its exchange rate targeting policy and adopt the fully independent monetary policy it needs to escape a debt deflation, but that time is nearing. When that move to a freely floating RMB does come, the cornerstone of the global monetary system will be removed. Suddenly, as they did when the gold standard ended in 1933 or the Bretton Woods system ended in 1971, investors will face the obvious reality that the most obvious reality is no more.

ONE WORLD, TWO SYSTEMS

The period following the collapse of the gold standard and the Bretton Woods system was one of chaos, and it took years rather than months or quarters to establish a new global monetary system. On this occasion, a dichotomy seems highly likely, with China and its allies forming one monetary system and the rest of the world coalescing around the US dollar as the cornerstone of its monetary system. It's very unlikely that China could simply repeg its currency at a lower level to the US dollar as that would result in an even greater reliance upon cheap Chinese products. It is also unlikely, given the deteriorating geopolitical situation, that China would wish to link its currency in any way to the exchange rate of its cold war enemy. Investors will increasingly have to choose to invest in only one bloc. And, for most, that will be the US bloc, where returns are more likely to be fungible and support spending in retirement. When the time comes to formulate the rules of the new US dollar bloc, the key criterion for almost all countries will be to establish a system that inflates away the excessively high levels of debt which are a legacy of the 'non-system'. Such a system will have to permit a high degree of domestic autonomy over the creation of money and also likely recognise that local authorities can influence the choices of their domestic savers with a view to forcing investment in government bonds and keeping yields low. This is known as financial repression and, in its consequences for investors, it is almost the polar opposite of the 'non-system' which has produced such outsized returns from most developed world asset markets.

THE MOST OBVIOUS REALITY

In a financial repression, bonds become, as they did from 1945 to 1979, 'certificates of confiscation'. The equity winners from the 'non-system' have a lot of adjusting to do to survive and eventually thrive in a financial repression. They will have to reverse a generation of financial engineering and will lose access to the very cheap manufacturing facilities which helped power their profits. The S&P 500, in particular, is full of the winners of the old regime. In seeking the equities that will produce real returns in the new system, investors should generally

avoid equity index constituents which have large market capitalisations – often because they have been the winners of the old regime. Eventually 'the most obvious realities' – the 'water' of the new monetary system – will form from the chaos. For the active managers who can see how it forms, there is the ability to both preserve and grow the purchasing power of savings. Success in investment need not entail getting the right answers about the future. It entails merely getting better answers than your competitors but, crucially, to the right questions. "What the hell is water?" is now the best, most obvious question.

"IN A FINANCIAL REPRESSION BONDS BECOME, AS THEY DID FROM 1945-1979, 'CERTIFICATES OF CONFISCATION'."

PERMANENCE *and change*

A potted history of the stock market

OVER THE CENTURIES, MARKETS HAVE CHANGED A LOT. SMOKE-FILLED GEORGIAN COFFEE HOUSES – NOT TO MENTION ANCIENT FORUMS – ARE A FAR CRY FROM TODAY'S CRYSTAL AND CONCRETE PALACES OF ELECTRONIC TRADING. And yet much has remained the same. The ups and downs, the booms and busts reflect the constants of human nature: fear and greed don't go out of fashion. Nevertheless, some important market trends of recent decades could have profound consequences for investors – most notably, the changing purpose of markets.

DUNCAN MACINNES

Fund Manager

IN HIS *LIFE OF THESEUS*, THE GREEK PHILOSOPHER AND HISTORIAN PLUTARCH RECORDS A PARADOX. Out of respect for the mythical founder of Athens, the citizens preserved the ship in which he returned from Crete after slaying the Minotaur. Over the years, as the ship's parts rotted, each was replaced. Plank by plank. Nail by nail. The question is: once every part had been renewed, was it still the same ship?

Here we present a timeline exploring how markets have changed over the centuries – and some ways in which they remain unaltered – before going on to explain how the market's twin purposes of funding enterprise and rewarding investors have become perilously imbalanced.

200BC

ANCIENT FORUMS

Some of the earliest recognisable financial markets were in ancient Rome – around 200 BC – where men would meet in the forum to trade interests in tax collection rights or farms, alongside the money lenders and merchants. These markets were just as prone to partisan dogma as today's – Roman playwright Plautus referred to the 'puffers' and "malevolent fellows…uttering calumnies". Such characterisations evolved into the 'liefhebbers' and 'contremines' in 17th century Amsterdam or bulls and bears today.

1608

A TECHNOLOGICAL EDGE

In their efforts to gain a predictive advantage, investors have long turned to cutting edge technology. With the invention of the telescope in 1608, traders could spot distant ships heading for Dutch ports. If a ship sat lower in the water, it was clearly laden with a large cargo of commodities, which would depress prices as they hit the market. This advance information allowed them to place their trades on the exchange before other investors received word.

> “These ventures often risked death; *bona fide skin in the game.”*

1688

INSURANCE INCEPTION

Whilst the scale and materials of the buildings may have changed over the centuries, the locations have not. Coffee houses – like those established in 1688 by Edward Lloyd – which began to insure risks such as highway robbery and ‘the assurance of female chastity’ becamehome to stockjobbers capitalising on the innovation of freely transferable shares in enterprises such as the Dutch East India Company.

Over 300 years later and just a short walk from their original buildings, the London Stock Exchange and Lloyd’s of London continue to perform the same basic functions, facilitating the transfer of billions in value and insuring risks like Lionel Messi’s legs and Bruce Springsteen’s vocal cords.

The parlours and salons of this era helped finance intrepid merchants and entrepreneurs hell bent on exploration. These ventures often risked death; bona fide skin in the game.

But these investors were no less sophisticated than today’s, with concepts like the time value of money, discounts and ‘intrinsick’ value widely used. They also had the creativity to invent 20% carried interest, the fee template for the world of hedge funds and private equity.

1690s

A MORAL MAZE

The massive growth in markets brought moral condemnation from the Church,[1] but also from disappointed investors. In the 1690s, Daniel Defoe wrote that "stock-jobbing is play, a box and dice may be less dangerous, the nature of them are alike, a hazard." In the 2020s, the box and dice have become 10x leveraged, no-commission trading on apps like RobinHood or Binance. The dopamine hit remains the same.

1772

THE FOUNDING OF FUNDS

The first ever investment fund was born out of the British credit crisis of 1772 when Dutch broker Abraham van Ketwich, sensing low risk appetite amongst his clients, launched a diversified global bond fund with a low management fee of just 0.2%.[2]

By 1900, investment trusts and mutual funds allowed citizens of modest means to gain access to a professionally managed, diversified portfolio of holdings, often in emerging markets. Many of these funds still exist, although 21st century sensibilities have prompted them to change their names from the likes of British Empire Trust and the Foreign & Colonial Investment Trust.

1774 Deed of Incorporation, Capital Amsterdam Foundation/Amsterdam City Archives

1815

INFORMATION IS POWER

Nathan Rothschild was supremely aware of the value of early and accurate information.[3] He established a proprietary network of couriers, swift ships and carrier pigeons, stationed strategically for immediate message dispatch.

In 1815, his courier arrived with news of Napoleon's defeat at Waterloo fully two days before Wellington's official messenger. Reportedly, Rothschild sought to inform Lord Liverpool, the British Prime Minister, of this momentous victory but was rebuffed by a butler, with the assertion that his lordship was in repose. So Rothschild turned his attention to the stock exchange, amassing a substantial quantity of gilts, which subsequently soared in value.

> "The dopamine hit *remains the same.*"

1 King's College London Professor Anne Goldgar argues that the 17th century Tulip Bubble in Amsterdam was exaggerated by 'Calvinist propaganda' as the church worried that consumerism would lead to societal decay

2 Rouwenhorst (2004), *The Origins of Mutual Funds*

3 Kay (2013), ft.com

1907

BOOM TO BUST TO BOOM

Americans espoused the most unfettered form of capitalism. The 19th century came to be dominated by the Robber Barons of the Gilded Age: the Rockefellers, Carnegies and John Pierpont Morgan, the man who single-handedly orchestrated the rescue packages in the panic of 1907.

The ambition and optimism of the early 20th century was visible in the Manhattan skyline. It reflected a transformation underway in markets, as the raucous outcry pits of yesteryear eventually gave way to something more institutionalised and democratic.

1929

STOCKS FOR EVERYONE

The bull market of the 1920s was more than just an economic phenomenon; it was a cultural revolution. By 1929, around 9 million Americans owned stocks, some 10% of households, staking their hopes and fortunes in pursuit of the American Dream. This was an astonishing number; just a few decades prior, the stock market had still been the preserve of the wealthy elite.

The next stage of development was a Cambrian explosion of savings and asset management institutions. Firms such as T Rowe Price, Fidelity, M&G and Franklin Templeton were all founded in the 1930s and 1940s.

4 Burrough and Helyar (1989), *Barbarians at the Gate*

5 McKinsey Global Private Markets Review 2023

1950s

NEW WORLD, NEW THINKING

The birth of modern portfolio theory in the 1950s shaped how an emerging industry thought about risk and return, laying an intellectual foundation for the decades to come.

As America flexed its economic muscles after World War II, people began to save in a way never before possible. These newfound pools of capital didn't just sit idle; they swirled into the then-novel vessel of pension funds, turbocharging the asset management industry. In the 1950s, asset managers controlled 10% of the US equity market. By the 21st century, this figure had surged to 70%.

Financial markets were also undergoing a rapid technology fuelled renaissance. The launch of NASDAQ in 1971 marked the advent of electronic trading, which had profound implications: trading volumes soared, and bid-ask spreads shrank.

> "The bull market of the 1920s was more than just an economic phenomenon; *it was a cultural revolution.*"

1980s

PRIVATE MARKETS AND PROCESSING POWER

In the 1980s, a competitor appeared: private markets. These had fewer regulations and less oversight, allowing managers greater control and eye-watering amounts of leverage. The leveraged buyout of RJR Nabisco for nearly $26 billion epitomised the swashbuckling spirit of the age.[4] Today, the private equity market is worth almost $12 trillion.[5]

With the advent of better data collection, increased computing power and sophisticated software, quantitative trading strategies took root. These PhD quants, more at ease with differential equations than dinner parties, marked a departure from traditional financiers. They didn't care about a company's business plans or management teams; they were designing mathematical models to exploit pricing inefficiencies in its stock.

Post 2008

COMPLEXITY AND CONVEXITY

Rather than relying on telescopes, market information began moving at the speed of electrons.[6]

High-tech investment firms make decisions in nanoseconds following abstract methodologies such as correlation and dispersion trading or statistical arbitrage.

Post 2008, we've witnessed the rise of multi-strategy hedge funds, or 'pod shops'. Their model relies on specialist traders seeking market-neutral, idiosyncratic alpha, overseen by sophisticated risk management technology, and with a ruthless approach to rewarding success and punishing failure. The only thing more remarkable than their performance is their fees. Only time will tell if these institutions have solved the riddle of markets or if these strategies are the next iteration of Long-Term Capital Management.

The rise of zero day to expiry (0DTE) options adds into the system another new component which remains untested in a crisis. These options, designed for professionals, afford a maximum time horizon of eight trading hours with extreme leverage. They didn't exist until 2022 but now account for a staggering 50% – and growing – of option trading volume.[7] Their advent seems likely to increase system wide fragility.

6 Famously, high frequency trading firm Spread Networks spent $300m to bore through a mountain in Pennsylvania to improve their trade latency by three milliseconds. That is three thousandths of a second – around 1% of the time it takes you to blink. Krugman (2014), The New York Times

7 Wigglesworth (2023), ft.com

THE RISE OF PASSIVE TRADING

Parallel to the rise of quantitative strategies was a more profound change, one rooted not in complexity but in simplicity: passive investing. The concept wasn't new. But, as active managers struggled to outperform their benchmarks, the allure of low fees and 'market returns' proved irresistible during a prolonged bull phase.

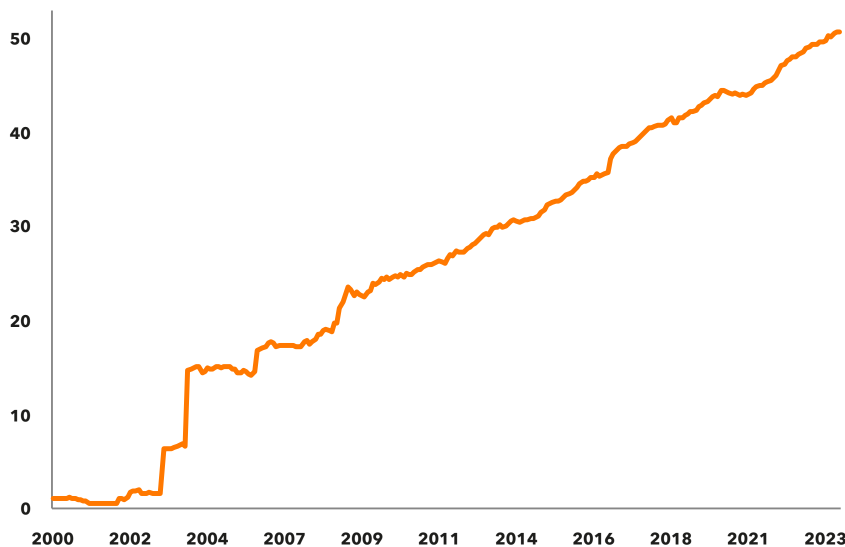
This shift towards passive strategies wasn't just a matter of investment philosophy. It was deeply entwined with technology. The automation of trading made it feasible to manage vast portfolios that replicated indices cheaply. The uptake has transformed the investment landscape: in 2023, passive strategies made up over 50% of global assets under management and almost all developed world net flows.[8]

Yet there is a parasitical aspect to passive investing: it relies upon the active participants of the market to price assets and assimilate information speedily and accurately. Can this be done effectively when active investors' share of the market keeps diminishing?

The world's two largest investment management businesses – BlackRock and Vanguard – are passive powerhouses. They are at the top of the shareholder register of almost every large company in the world. In the age of ESG, it is strange that the top shareholders of most global businesses are philosophically agnostic to what they invest in, what price they pay and how those businesses are run.

Figure 1

ALL EQUITY FUNDS – PASSIVE SHARE %



Source: EPFR Global, Bernstein analysis

8 Goldman Sachs flow of funds, US weekly, 13 October 2023

> “There is nothing permanent *except change.”*
>
> **HERACLITUS**

WHAT ARE MARKETS FOR?

Our timeline reveals both change and constancy in the evolution of the stock market. But one change in the make-up of markets is most crucial of all: their purpose. Markets were conceived with a view to providing funding to capital-hungry businesses and, in exchange for that, strong returns for investors.

The coffee house markets of centuries past were high risk endeavours with a power law distribution of returns. By pooling risks and raising capital, they encouraged enterprise and were thus more akin to today’s venture capital industry.

Today’s markets are closer to public utilities. Their goal is less about directing capital to its most productive ends than about generating returns for stakeholders or even signalling the health of the economy.

Each year, many trillion dollars’ worth of publicly traded stocks and bonds change hands. For public equities, the total value is around $100 trillion. Of that, only $400 billion, well below 1%, represents new investment, used to grow companies via IPOs or secondary issuances.[9] The rest is secondary trading of stakes in existing enterprises.

Meta (formerly Facebook) has raised money just twice from the public markets, in 2012 and 2013, providing exit liquidity for early investors and founders plus some growth capital. Every sale and purchase since then, averaging around $9 billion each day, has been a seller and buyer transacting without the company receiving any capital.

By contrast, the total global debt issuance has been greater than $20 trillion in each of the last five years.[10]

Only a tiny fraction of public market activity is now about providing equity capital to help companies grow. Increasingly, the purpose of financial markets is to farm existing businesses and receive or trade a proportionate stake in the cash flows they generate.

Subtly, over several decades, the purpose of equity markets has been redefined. In the 1990s, President Clinton said it was “neither prudent nor appropriate for a president to comment...on the market.”

Yet Donald Trump was explicit that stock market returns would be a measuring stick of his presidency, explicitly tweeting about the US market more than 150 times.[11]

The media has morphed the stock market into an abstraction which tells you how the real economy is doing, even though the two have become increasingly divorced.

9 SIFMA Capital Markets Fact Book 2023
10 Ibid
11 Randewich and Ahmed (2020), reuters.com

Markets have fallen victim to Goodhart's Law: when a measure becomes a target, it ceases to be a good measure. The equity market is now 1.7x the size of US GDP, having traded at less than 1x for most of the 20th century. The market is too big, too visible, with too many external implications not to be on policymakers' radar.

Adam Smith's invisible hand has been replaced by the highly visible hand of central banks and governments, which have a vested interest in rising asset prices. Andy Grove's 'only the paranoid survive' and Joseph Schumpeter's 'creative destruction' have been ousted by regulatory capture, oligopolistic incumbents and the maintenance of the status quo – taking much of the market's vitality with it.

"Does the political imperative of rising asset prices make markets safer? *Or over-priced and moribund?"*

A CAUTIONARY TALE

Financial historian Jim Grant observed that "progress is cumulative in science and engineering, but cyclical in finance." Despite centuries of advances, many of the problems investors grapple with remain the same.

The beguiling yet confounding game of markets is a problem with no solution. You can't innovate away human nature; the context changes but our psychological frailties remain.

However, the changing purpose of markets raises some important questions. Does the political imperative of rising asset prices make markets safer? Or over-priced and moribund? As Liz Truss's UK government discovered, political largesse is fine – until the markets lose confidence. And tipping points can only be identified in hindsight.

Plutarch had another story about Theseus' ship. Before leaving for Crete, Theseus and his father, Aegeus, agreed a signal. If Theseus survived his fight with the Minotaur, he would replace the ship's black sails with white. But, in his joy at returning home, Theseus forgot to make the change. And Aegeus, mad with grief, threw himself off Cape Sounion and drowned.

Ill-advised signalling, attempts to cushion against painful outcomes, irrational exuberance, calamitous unintended consequences. We can only hope that political efforts to manage asset prices don't ultimately precipitate ruin in financial markets.

GETTING TO THE BOTTOM OF THE DOLLAR

TODAY, KING DOLLAR REIGNS SUPREME OVER THE GLOBAL ECONOMIC AND FINANCIAL SYSTEM. IT IS THE WORLD'S PRINCIPAL RESERVE CURRENCY, USED IN ALMOST 90% OF FOREIGN EXCHANGE TRANSACTIONS. But might the days of dollar supremacy be numbered? To assess the dollar's future, we must first consider its past. For that, we look to the latest addition to the Ruffer collection of historic currencies – a clutch of noteworthy bills – displayed on the walls of our London office.

GEMMA CAIRNS-SMITH

Investment Specialist – UK Wholesale

COINS OF THE COLONIES

The dollar's origins can be traced back to the Joachimsthal silver mines of 16th century Bohemia. Coins minted there became known as thalers – anglicised as dollars.

The next phase in the journey to the currency we recognise today came with the Spanish colonisation of the Americas. Silver coins, like many pictured on these pages, became the default currency for trade across the vast and expanding Spanish empire. These pesos were known in English as Spanish dollars, or pieces of eight.

The success of the dollar in facilitating transatlantic trade with the Latin south throughout the 17th and 18th centuries stood in stark contrast to the North American colonies where, under British control, there was a dearth of practical means of exchange.

Successive British governments prohibited the minting of new currencies whilst failing to provide sufficient coinage to meet the fast-growing demand in the burgeoning northern economies. Eventually the colonial governments took the onus upon themselves and, in 1652, the Massachusetts Bay Colony began minting silver shillings imprinted with the emblem of a pine tree.

With no gold or silver mines of their own, the colonies sought an alternative to coinage and began issuing paper money. Between the 17th century and the onset of the American Revolution (1765-1783), each of the 13 colonial governments released their own currencies. These were not physically backed by gold or other commodities but by a simple promise. With trust as collateral, fiat currency had arrived.

A REVOLUTIONARY IDEA

In 1765 Britain sought to impose a sterling denominated sales tax on the colonies via the Stamp Act. It met fierce opposition, under the slogan 'no taxation without representation.' In 1775, the Continental Congress – which had executive function for the 13 colonies and coordinated resistance to British rule – launched the continental dollar.

Continental dollars were printed with clear intentions: to fund the revolution, pay soldiers and liberate America from British rule. From 1775 to 1779, printing totaled $200 million.[1] This was a vast issuance – too vast. A swift devaluation followed, and the phrase 'it's not worth a continental' soon entered the vernacular. In 1781 they were abandoned, signifying the official failure of America's first foray into fiat.

1 National Bureau of Economic Research
2 United States Mint
3 Federal Reserve

THE ROOM WHERE IT HAPPENED

Until Lin Manuel Miranda's hearty Broadway show, Founding Father Alexander Hamilton's legacy had faded into relative obscurity. But it was Hamilton, as innovative as he was daring, who swept in with an early experiment in central banking.

He came up with the blueprint for America's first national bank, which opened in Philadelphia in 1791. First Bank was modelled on the Bank of England and was granted a 20 year charter and a mandate to issue credit for national improvements and economic development. First Bank provided the infrastructure required for the next attempt at a single and functional currency. The US silver dollar – issued with a ratio of silver to gold fixed at 15:1 – was ratified in 1792.[2] This marked the return to commodity-backed money.

But the silver dollar was no silver bullet. By 1860 an estimated 8,000 different types of currency were still in circulation, and a unified federal monetary system remained a pipe dream.[3]

“BUT THE SILVER DOLLAR WAS NO SILVER BULLET.”

CANNONS AS CATALYSTS

Wars, throughout history, have tended to catalyse industrial and economic change. The outbreak of the American Civil War in 1861 exposed the limitations of the bimetallic system. Reserves of gold and silver were insufficient to meet the demands of financing war. Congress, to advance the cause of the Union, issued a new form of paper money, which became known as ‘greenbacks’ because of their green reverse. They were printed at breakneck speed: $450 million worth of greenbacks were issued between 1862 and 1865, and the consequent rise of inflation quickly eroded their purchasing power.

The greenback was down, but not out.

FROM GREEN, BACK TO GOLD

The ubiquity of greenbacks made their outright removal from circulation impractical. Instead, Congress decided to cut back production and, in 1879, link the currency to gold. But what had changed that made physically backed dollars viable once again?

America emerged from the Civil War politically stronger and with a more prosperous economy. Rapid industrialisation and an accompanying boom in manufacturing brought about a Gilded Age. By 1900 the United States' share of global GDP had reached 18%.[4] As international trade boomed, the dollar became increasingly significant on the world stage. At last, Americans could be confident in a currency with clout.

Domestically, however, the absence of a federal monetary system remained problematic. The banking system was disparate and fragmented – operating as a series of cottage industries with some 20,000 individual institutions.[5] The system's instability culminated in the panic of 1907, which saw a frenzy of withdrawals. Runs on the major New York banks eventually required bailouts from private institutions and individuals led by John Pierpont Morgan.

This crisis accelerated plans to establish a central bank as the lender of last resort. The Federal Reserve System (Fed) was founded in 1913, with sole authority for the printing of paper currency. This provided the stability the dollar needed to continue its rise to global hegemony.

"WHILST IT MAY HAVE REMOVED ITS CROWN OF GOLD, THE DOLLAR'S REIGN CONTINUED THROUGH THE LATTER HALF OF THE 20TH CENTURY."

EXCEPTIONAL TO EXORBITANT

In the first half of the 20th century, US export trade boomed, with its comparative leadership accelerated by the two world wars. America supplied the allies with armaments and goods in exchange for gold, resulting in the US accumulating roughly 70% of the world's gold.[6] By contrast, Britain amassed debt of around 270% of GDP, the franc devalued by 80%, and Germany's monetary system collapsed entirely.[7] By the mid-20th century, the US had emerged as the pre-eminent global superpower.

The 1944 Bretton Woods Agreement was King Dollar's coronation. Under this system, 44 countries agreed to base their currencies on the US dollar rather than the gold standard, whilst the dollar would remain backed by gold. This created structural buyers for dollars, affording the US exceptional monetary and fiscal freedom – described by Valéry Giscard d'Estaing, then the French minister of finance, as the United States' 'exorbitant privilege'.[8]

4 Brands (2011), *Greenback Planet: How the Dollar Conquered the World and Threatened Civilization as We Know It*
5 Federal Reserve Bank of St Louis
6 International Monetary Fund
7 Office for Budget Responsibility
8 Eichengreen (2010), *Exorbitant Privilege: The Rise and Fall of the Dollar*

FAST-TRACK FIAT

But privilege never lasts in perpetuity. Successive US administrations tested the dollar's strength by adopting 'guns and butter' fiscal expansion. The butter came with President Lyndon B Johnson's 'Great Society' project in the mid-1960s, the guns with the Vietnam War, whose ballooning costs forced President Nixon to suspend gold conversion in 1971.

This severance from the gold standard was made permanent in 1973, amid concerns that US gold reserves were no longer sufficient to cover the number of dollars in circulation across the globe. Like its ancestral greenbacks, the dollar had become a pure fiat currency.

Whilst it may have removed its crown of gold, the dollar's reign continued through the latter half of the 20th century. It was supported primarily by trade agreements, like the 1973 Petrodollar Deal in which Saudia Arabia committed to price and trade oil in dollars in return for US aid. In 1975 the other OPEC members followed suit.

More recently, capital flows have provided the ballast. With dollar-based securities protected by US rule of law and backed by the US federal state, dollar capital markets have become the deepest and most liquid in the world. As a result, the dollar's role as the world's international reserve currency has thus far been guaranteed. Testament to its domination, over 65 countries today still choose to peg their currencies to the dollar.[9]

BUCK TO THE FUTURE

Clearly, a dominant dollar is not in everyone's interest. The Chinese Communist Party has made no secret of its desire to upend the dollar-based world order by positioning the renminbi as an attractive, carefully managed alternative. A growing number of countries are also seeking to use bilateral currency settlement systems, potentially aided by the advent of central bank digital currencies (CBDCs).

US sanctions on Russia after its invasion of Ukraine have increased the perceived risk of holding dollars for potential enemies of America, and this too will encourage a diversification of reserve assets. Commodity exporters, such as Saudi Arabia, may also begin accepting alternative currencies for key exports.

Capital flows are critical in the kingdom of currencies – they dwarf trade flows. Until there is a meaningful shift in investors' willingness to hold their assets in renminbi or digital currencies, we are unlikely to see an abrupt and immediate de-dollarisation of the global economy.

The dollar owes its staying power not only to the political power and economic prosperity of its issuer, but also to the flexibility of the currency itself and to a less tangible quality – the legacy of trust.

Still, there may come a time when some investors are forced to bet their bottom dollar on whether the US will remain on top. ●

9 The Brookings Institution

Book Corner

Takes on three books, by three people at Ruffer. A mix of personal favourites and topical insight, with some utility for investors.

THE CURRENCY OF POLITICS
Stefan Eich

PAGE 119

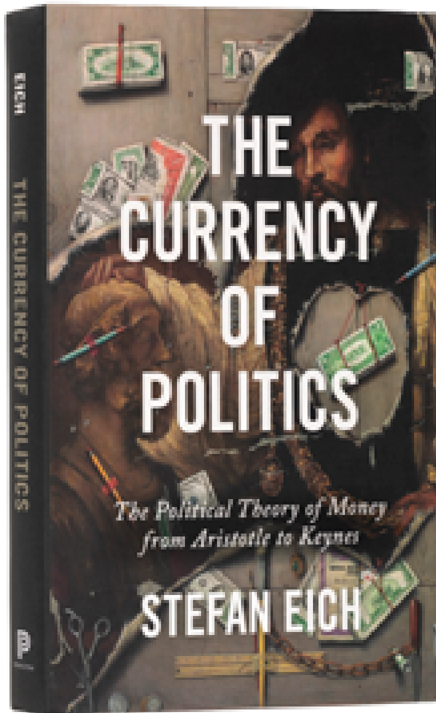
MATERIAL WORLD
Ed Conway

PAGE 122

THINKING IN BETS
Annie Duke

PAGE 125

THE CURRENCY OF POLITICS
Stefan Eich
PRINCETON UNIVERSITY PRESS, 2022



Lessons from monetary history

MY THIRD CONTRIBUTION TO BOOK CORNER COMPLETES AN UNINTENDED TRILOGY. In 2019, I reviewed Dan Lyons' *Disrupted*, which detailed the exploitation of labour by capital; in 2020, Chris Arnade's *Dignity*, which laid bare the societal effects of that exploitation. This year, I review a history of the political and monetary regimes which led to the world we operate in today.

Stefan Eich is a political theorist and philosopher, and it is through these prisms that he seeks to define money as more than simply a medium of exchange. Eich's central thesis is that money is not just a tool in politics; it is also the currency through which political power is ultimately acquired and wielded. This reflexivity informs policy and the reactions to it.

The *Currency of Politics* evaluates five key figures in monetary history – Aristotle, John Locke, Johann Gottlieb Fichte, Karl Marx and John Maynard Keynes – placing

their theories in the context of the regimes which spawned them before arriving at the seemingly apolitical monetary world post Bretton Woods. His analysis of each figure reveals the underlying tensions between democracy and capitalism – and the inevitable shift in policies when breaking points are reached.

Central to early political theories of money is Aristotle's dictum: "Currency can be just, but not when it fuels accumulation for its own sake. As a tool of reciprocity, however, currency serves political justice." This quote perhaps reveals just how far removed those theories are from today's system.

Locke's policies sought to re-establish monetary order and trust in the value of money after one of the first modern instances of currency debasement. He argued it was necessary to make money anti-political; but, as Eich notes, this was itself a political act.

Fichte and Marx had two contrasting perspectives. Fichte saw the benefits of the state actively regulating money, and capital controls. Marx was more radical: money was unavoidably political, overly influenced by and therefore lenient to the owners of capital. His response was essentially to abolish money and leave decisions solely to the state. Unsurprisingly, this has not carried far.

Keynes subsequently provided much of the current framework: independent central bankers operating with loose political oversight. But, I would note, people often forget that Keynesian policies frame government as the employer – not just the lender – of last resort.

EXPOSING A SILENT REVOLUTION

Having reviewed these five monetary regimes, Eich discusses the apparent depoliticisation of money since the late 1970s. This 'silent revolution' has allowed central banks to distance themselves from any political responsibility for money. If tight monetary policy meant putting people out of work and causing economic harm, it was better not to be seen doing so intentionally. Following prescribed monetarist rules to control money supply and prices allowed central bankers to avoid

> "This 'silent revolution' has allowed central banks to distance themselves from any political responsibility for money."

blame for any resulting pain. Monetary policy (or money itself) had become 'market led' and free from political scrutiny.

Eich describes this as a period of neglect. The politics of inflation dominated the immediate post-Bretton Woods years. Since the 1970s, money has been subject to technocratic rule.

Eich, a left-leaning protégé of Adam Tooze (who saw the post-2008 policies as anti-democratic), focuses on the need for money to be re-politicised. "Inflation targeting was perfectly compatible with enormous asset-price inflation and a build up of financial bubbles," he says. "In calm times it had been possible to reduce money to a seemingly neutral means of economic exchange. During financial crisis it became harder to disguise the formative nature of fiat money and the political choices inherent to it… As the veil fell money emerged once more as a construct of our collective imagination."

ADJUSTING TO A NEW REGIME

Whether or not you agree with his politics, he is perhaps right that we are now operating in a new world. At the Grant's conference in 2021, Henry Maxey gave a speech titled 'Preparing for a world central bankers can't imagine'. We should expect a very different model moving forward, and this is reflected in our portfolios.

How do I think this new model might look? Money can find its way to four places in an economy: the shareholders; the managers of companies; governments; and workers. During the era of inflation targeting and deep disinflation, most of the money accrued to the first two. That was amplified by the policy decisions after the collapse of Lehman Brothers.

But the response to the pandemic started a new wave of fiscal dominance, with money being re-politicised. One clear example: last September, Joe Biden stood on picket lines alongside the United Auto Workers, the first sitting US president to join labour in demanding higher wages. The pendulum does not need to swing far towards workers and governments to do considerable damage to asset owners.

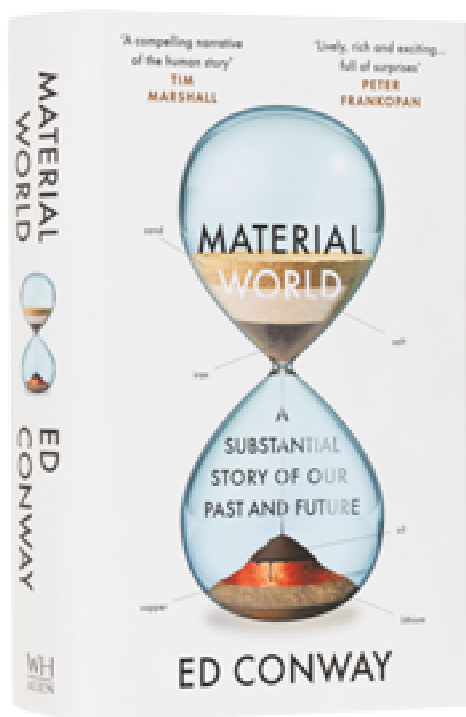
Economists are taught that inflation and prices can be plotted on spreadsheets, based on rational and homogeneous choices. However, if the politics of money is going to become more explicitly recognised, we should prepare for a less predictable world.

ALEX LENNARD

Fund Manager

MATERIAL WORLD
Ed Conway
WH ALLEN, 2023

Holes in the ground



ONE OPTION, NEARLY (BUT NOT) SUGGESTED BY ED CONWAY, WOULD BE TO DIG UP CORNWALL. THAT IS, IN THE NAME OF THE ENERGY TRANSITION. It seems unfittingly twee to begin in England's beautiful and rugged southwestern-most tip for what amounts to a sweeping, urgent and thorough examination of civilisation's dependence on the physical resources making up the 'material world'.

A material world distinct from the services and technology age we live in, which Conway calls the ethereal world.

This is the tension at the heart of Conway's story – an ethereal world disconnected from the material world, but entirely dependent upon it.

DISCONNECTED DEPENDENCE

Conway uses six physical substances as his medium: sand, salt, iron, copper, oil and lithium. By examining the people and processes behind their extraction, distribution and application, he unearths unexpected and uncomfortable truths about the extent of modern society's reliance on the physical world.

By now, most of us understand lithium's indispensable role in the energy story. Lithium-ion batteries are used in everything from industrial scale energy storage farms and electric vehicles to wireless headphones and vaping devices. But where does lithium come from?

Conway takes us to the salt flats in Chile's Atacama Desert, one of the driest places on earth. A few metres below ground, there are gigantic underground reservoirs of brine.

> “He unearths unexpected and uncomfortable truths about the extent of modern society’s reliance on the physical world.”

These lithium ponds have sat undisturbed for millions of years. The extraction process involves pumping up the brine and gradually allowing the sun to evaporate away the water, then separating the lithium from the other residual salts.

It is a complex process with a heavy footprint. Lithium extraction reveals two of the major questions surrounding our interaction with the material world. Are we willing to destroy a pristine ecosystem to extract valuable minerals? And who foots the bill? Battery makers are in a tussle with each other, and with governments, to secure access to lithium. This raises political questions. At the national level, local populations demand compensation for the impact on their land and politicians seek to protect or exploit these resources; and, at the geopolitical level, access to resources determines power on the international stage.

YOU CAN’T EAT OIL

So read the placards held aloft by protestors outside the London HQs of some major energy companies last year. Their message: we are at a critical point for humanity and, unless we stop using oil, we will slide towards extinction. We must prioritise our survival, or else.

But we do eat oil. Or at least fans of salt and vinegar crisps do. Conway reveals that the vinegar taste in crisps comes from petrochemicals.

Now this isn’t reason enough in itself to keep the drills spinning, but it does illustrate how (unknowingly) reliant we have become on the ‘dirty’ resources in environmental activists’ crosshairs.

LIKE TWO ATOMS IN A MOLECULE, INSEPARABLY COMBINED

Beyond the obvious environmental challenges posed by our reliance on the material world, Conway’s study demonstrates the hidden complexity of modern supply chains.

Raw substances are surprisingly intertwined, with the production or processing of one entirely dependent on another. Hence Conway’s scepticism that the energy transition can happen with minimal disruption to the planet. He puts some numbers on it, to illustrate our collective underestimation. To produce one tonne of steel, you need to extract 1.6 tonnes of iron ore and burn 770 kg of coal. For one tonne of concrete, 1.3 tonnes of sand are required. One two-megawatt wind turbine (which can power 2,000 houses) requires 295 tonnes of steel, 48 tonnes of iron and 1,300 tonnes of concrete.

Ultimately, we will remain beholden to the material world, and harnessing the power of raw materials depends upon the continued running of vast, intricate global supply chains.

NUANCED OPTIMISM

Now, and for the foreseeable future, resource-hungry industries are primarily concerned with finding the path of least resistance to the raw materials they need. Which brings us back to Cornwall, specifically Cornwall's abundant copper.

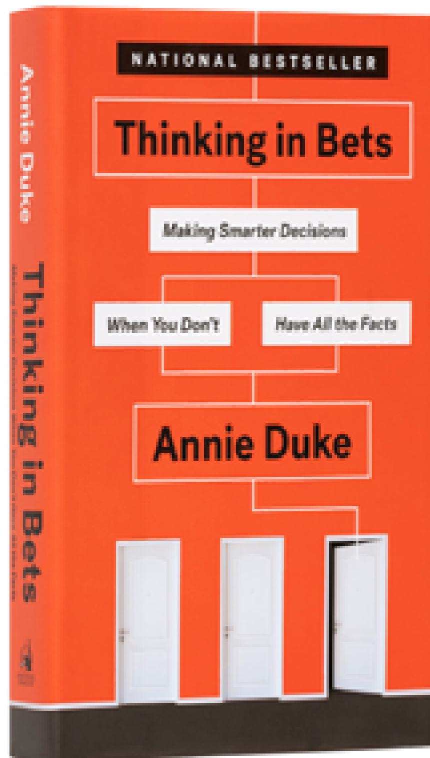
The suggestion that we should dig great holes in the Cornish countryside to extract copper for industry is anathema to most British readers. *Material World* forces us to confront these tricky and essential questions. Ultimately, what price are we willing to pay to keep our modern world running?

But Conway doesn't leave his readers to ruminate on the intractable problem that "the world's twin goals of decarbonisation and development are heading for a collision." Nor does Conway conclude with any blithe assumption about civilisation inevitably muddling its way through. No imaginary matriarch and her inventive offspring here.

Conway isn't didactic in the slightest. Rather, we're left with a deeper understanding of the critical importance of narrowing the gap between our ethereal society and our *Material World*.

"No imaginary matriarch and her inventive offspring here."

NYASHA MTETA
Associate – Private Wealth



THINKING IN BETS
Annie Duke
PORTFOLIO PENGUIN, 2018

Looking for luck

"GAMBLING'S FOR FOOLS," SANG IAN 'LEMMY' KILMISTER IN MOTÖRHEAD'S 1980 CLASSIC ACE OF SPADES. BUT, FOR ONCE, THE SAGE OF STÖKE MAY HAVE BEEN WRONG. Certainly, Annie Duke is no fool. She was studying for a PhD in psychology at the University of Pennsylvania before abandoning academia and taking up professional poker. It wasn't a bad decision: she became one of the most successful female players of all time, winning over $4 million at official tournaments.

But not before she had used her psychology background to scrutinise her own decision making and recognise how random outcomes can really be. In poker – as in life – chance and hidden information can have an impact on outcomes which is significant but unquantifiable in advance. The challenge for any decision maker is to reduce this impact.

Thinking in Bets distils Duke's experience and analysis into a practical and accessible guide to improving decision-making in any sphere.

Not least for investing. After all, each investment is like a bet. The buyer is banking on prospective returns being greater than the 'risk-free' alternative of US Treasury bonds. The outcome will be determined by both skill and luck.

It will also often vary over different timeframes. As investment markets can move in random directions in the short term, luck can play a significant role. Over the long term, however, the fundamental drivers of the asset's performance count, so skill is more likely to be rewarded.

To understand if a manager has been lucky or skilful, we first need to break down the relationship between decision quality and decision outcome. Just because the investment manager has had a few great years of performance does not mean they are necessarily skilful. Outcomes are often out of our control. We can make a bad decision and still have a good outcome, or vice versa.

YOU WIN SOME, LOSE SOME

Imagine it's New Year's Eve 1999, and you are considering an investment in Microsoft. You have a high level of conviction (say 90%) that Microsoft will benefit from the coming internet revolution. And it turns out you're right about that: since 2000, Microsoft stock is up over 900%, making it one of the best performers of the past two decades. But do you have the nerve to hold on to your investment when it loses 65% during the first year as the dot.com boom turns to bust?

Have you been unlucky? Or unskilful? Probably both – as Duke notes, "just as we are almost never 100% wrong or right, outcomes are almost never 100% due to luck or skill."

However, as in all scientific endeavours, the sample size matters. Results will eventually revert to the mean, so it makes sense to evaluate the process irrespective of the end outcome. The risk in relying on outcomes as a feedback mechanism is that random, improbable results could wrongly lead us to change our framework or beliefs. Decision quality should therefore be judged on repeatability. The objective of decision analysis is to delineate luck from skill; to focus on the signal, whilst ignoring the noise.

Duke argues the best way to do this is through probabilistic thinking. She suggests envisaging different possible outcomes as the branches of a tree, with the size of each branch determined by both its likeliness and the impact of the potential outcome.

What does this mean for an investor? Nipping back to 2000, I have 90% confidence that Microsoft will benefit from the internet revolution, but I deem that outcome already fully priced into the shares. That complicates the risk/return picture – is it worth investing? Probably not, for now.

Duke also points out that, by deliberately considering alternative scenarios, we reduce our susceptibility to hindsight bias

"The objective of decision analysis is to delineate luck from skill; to focus on the signal, whilst ignoring the noise."

(seeing outcomes as inevitable once they've happened). The journey to today was once uncertain. What we struggle to recall are the branches lopped off by the passage of time. The past seems deterministic, whilst the future is probabilistic.

Counterintuitively, striving for accuracy in decision-making contradicts how our brains have evolved. Our prehistoric tendencies prioritise efficiency over accuracy. If you encounter a sabre-toothed tiger, don't think, run – and hope someone else is slower to react. But, when making decisions, accuracy is vital: pick the poisonous berry, and your decision-making ability may be permanently impaired. *Thinking in Bets* seeks to marry these two otherwise competing modes of thought.

To think in bets means entering a state of perpetual learning. Challenging our existing tenets by seeking objectivity through truth-seeking and belief calibration. Changing our minds as the facts change. Only then are we more likely to improve our chances of favourable outcomes. And favourable outcomes can compound, allowing the skilled poker player – or investment manager – to prevail over time.

> "If you encounter a sabre-toothed tiger, don't think, run – and hope someone else is slower to react."

CHARLIE KING

Associate – Private Wealth

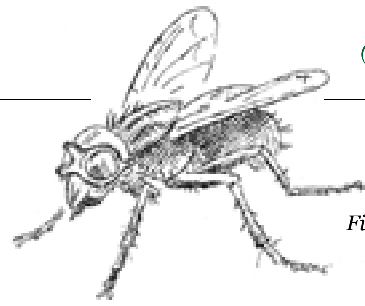


Figure B

V for Victory

WELCOME TO THE INAUGURAL RUFFER REVIEW CROSSWORD. BY INVESTMENT MANAGER E. ORE, IT IS A TEST OF BOTH GENERAL AND INVESTMENT KNOWLEDGE. Most clues are in classic cryptic form, others you will find depicted visually on this page and the next. The letters found in the green shaded cells of the completed grid can be written into the (5,4) block below to produce a final answer.

This being finance, there are acronyms. Where this is the case, we have listed the clue length as (1,1,1) etc.

If you would like your homework marked, please send a copy of the completed grid and final answer to review@ruffer.co.uk

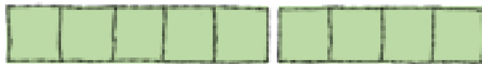


Figure C

ACROSS

1 Drug seller drinks vino too messily, losing it (4,7)
7 Helped to cause the 2022 gilts crisis? Liz did it to begin with (1,1,1)
9 At home allow sound (5)
10 Mad dog returning with German, for goodness' sake! (9)
11 Fashionable communist accepting one starting song in church (7)
12 *Figure A* (1-3)
14 *Figure B* (3)
15 God is understated in conversation (4)
16 Changes tides (5)
19 Terrorist organisation harbours conservationists within (5)
20 Moose hidden in dusk leave westward (4)
21 Company holds large debt instrument (1,1,1)
23 The leader of Qatar or the CCP rules in Europe? (4)
24 Shortage of French in good shape (about 101) (7)
26 *Figure C* (9)
27 *Figure D* (5)
28 Failed US bank's bravest returning, shedding tear (1,1,1)
29 Wheeler-dealers note huntsmen trapping stoat's tail (4-7)

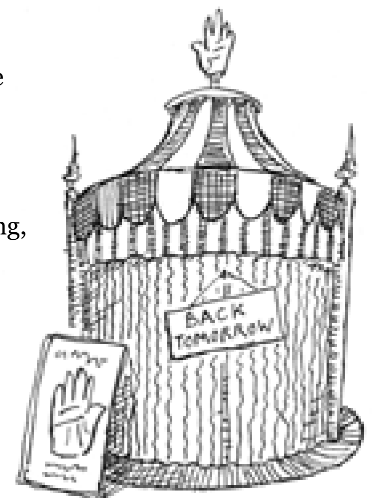


Figure F

Figure D

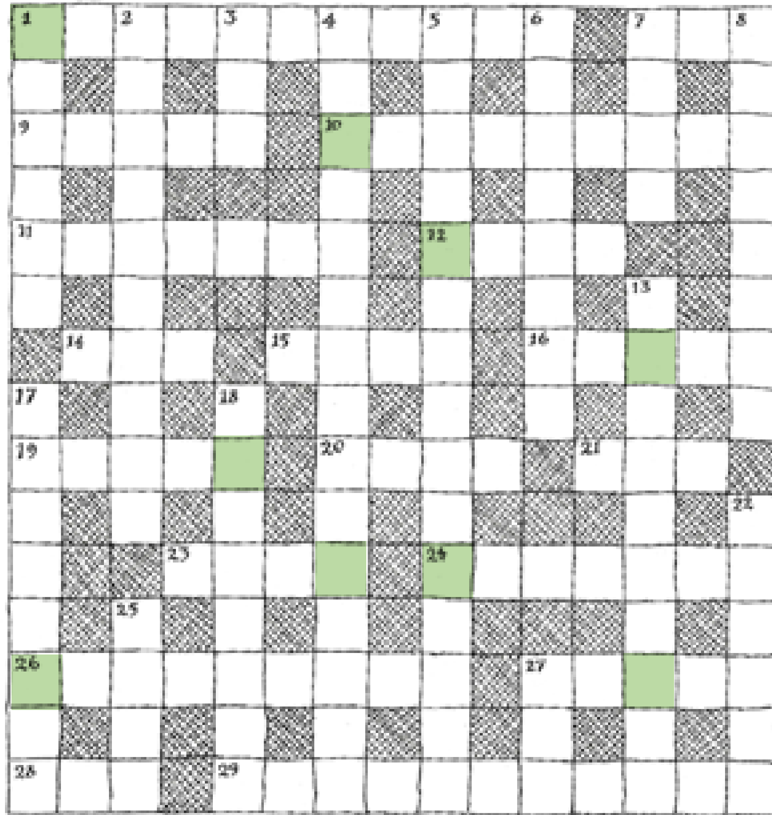


Figure G

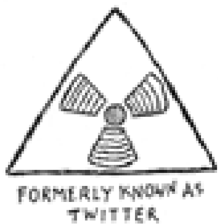


Figure A

DOWN

1 Victor amongst AI din arising (6)

2 Vega's the Greek translating Livy to Latin, losing direction? (10)

3 Loony head teachers (3)

4 *Figure E* (5,2,4,4)

5 I'll kid, extending misguided tips in the UK? (5-6,4)

6 King detests holding eastern half of Iran – lands ruled by Genghis's descendants, perhaps (8)

7 Europe's luxury empire, recently unseated by 1 across (1,1,1,1)

8 In beginning of track Queen established the price of time? (8)

13 Produce solution containing five interest rates across maturities? (5,5)

17 EMI loses head, unknown model copies music compilations (8)

18 *Figure F* (5,3)

22 *Figure G* (6)

25 Posh British after saint's remains (4)

27 Mid-sangria the Spanish mix well (3)

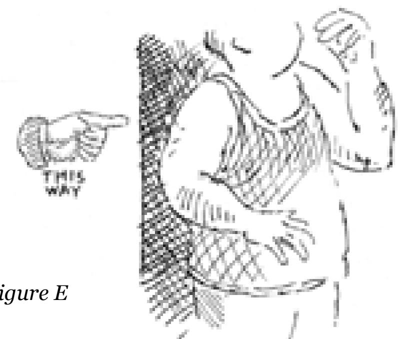


Figure E

About Ruffer

Ruffer looks after investments for institutions, private clients, financial planners and charities in the UK and internationally.

Our aim is to deliver positive returns, whatever happens in financial markets.

For more on what we do and how we do it, please visit ruffer.co.uk

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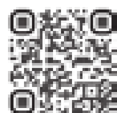

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Answers

SPOT THE DESSERT – PAGE 3

1. **APPLE CRUMBLE**
2. **GINGERBREAD MAN**
3. **ICE-CREAM SUNDAE**
4. **COFFEE MOUSSE**
5. **RHUBARB & MASCARPONE**
6. **TUTTI FRUTTI**
7. **BLACKBERRY PIE**
8. **VANILLA SHORTBREAD**

006

"Brilliance and bankruptcy were two sides of the same coin."
Rory McIvor PAGE 34

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