

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.



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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.

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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.

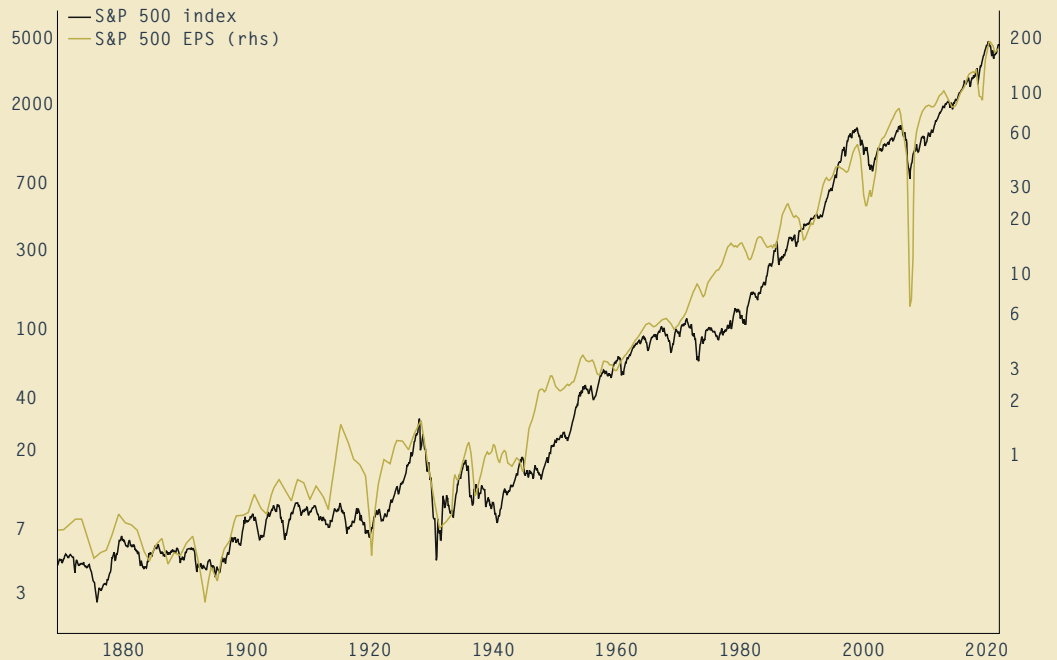
This second point needs some immediate attention, before laying out the reasons for our thinking in more detail. In brief, machines’ focus is typically on short-term drivers. And those are frequently unrelated to drivers that dominate in the long term. Therefore, a disciplined medium-to-long-term investor 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.

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.

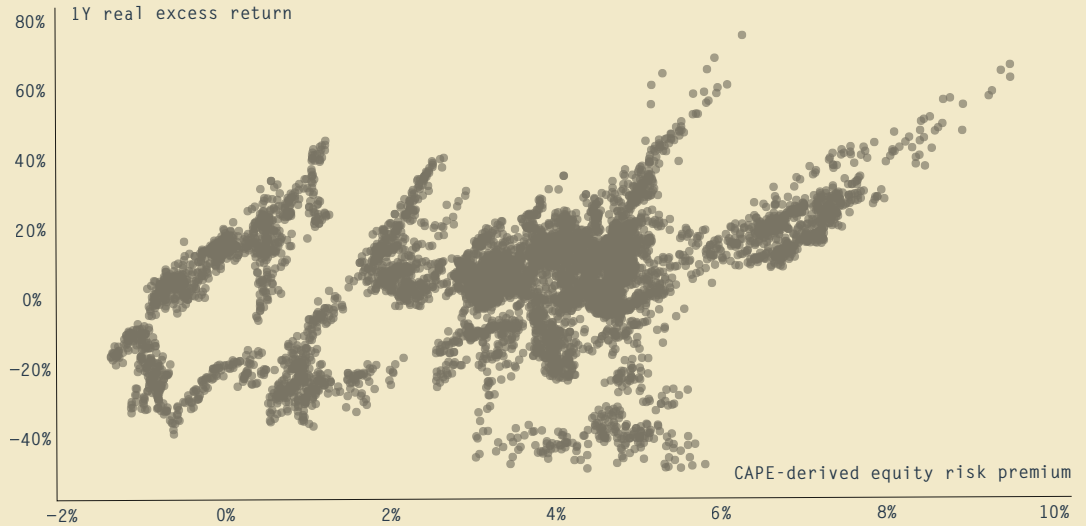
It is exactly because long-term drivers are very different from the collection of drivers that matter most in the short term, combined with machines' concentration on the short term, that active investors can have an advantage by focusing on the long term. Moreover, machines' short-term focus might create 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

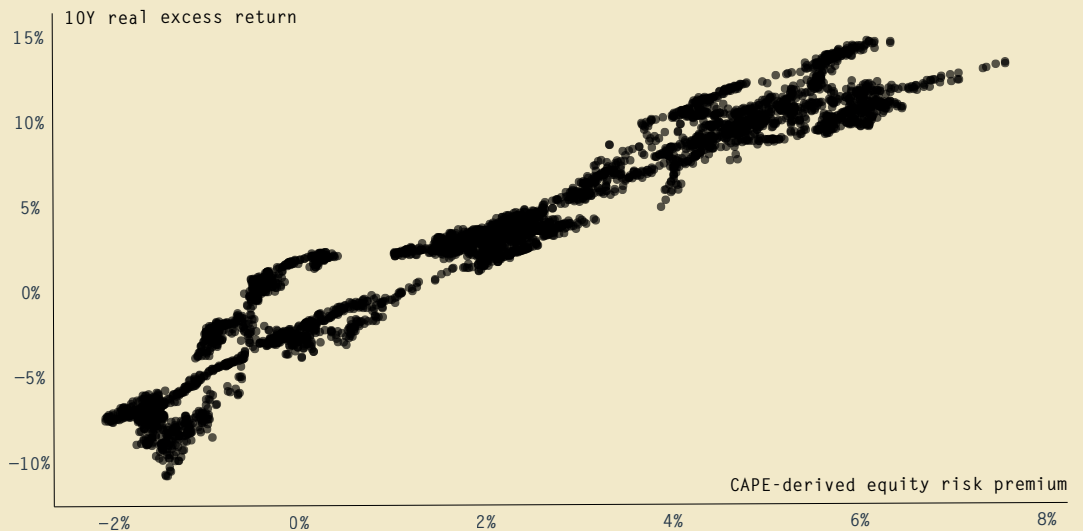
INDIVIDUAL DOTS REPRESENT A MONTH, DATA FROM JAN 1970. SOURCE: DATASTEAM, RUFFER CALCULATIONS



...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: DATASTEAM, RUFFER CALCULATIONS

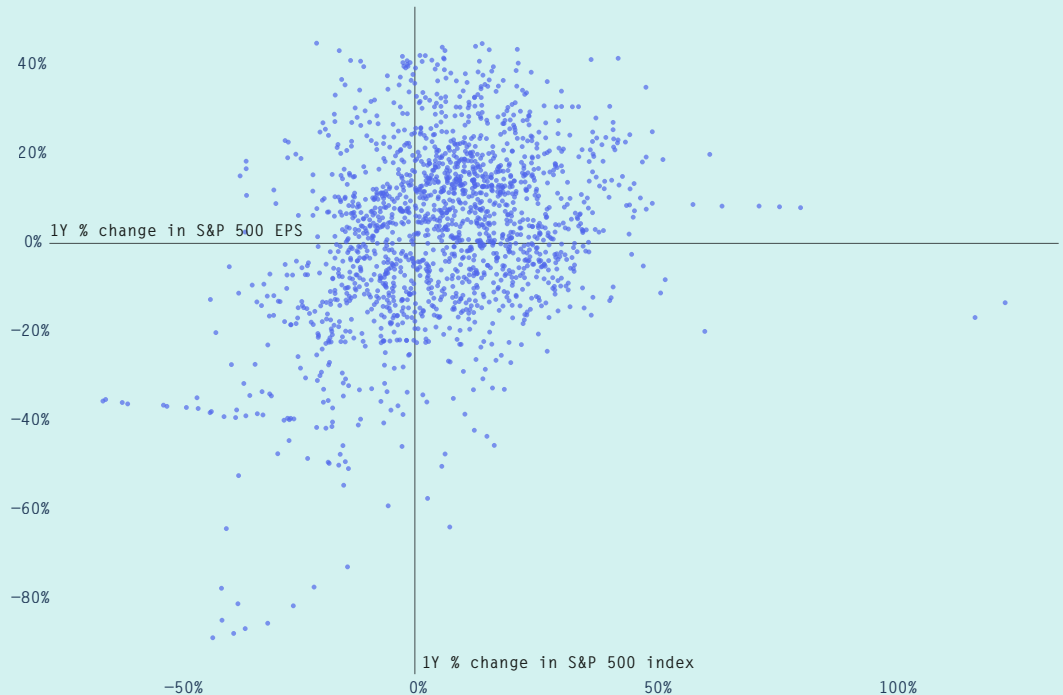


And EPS growth does not seem to matter for equity markets on a one year view.

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

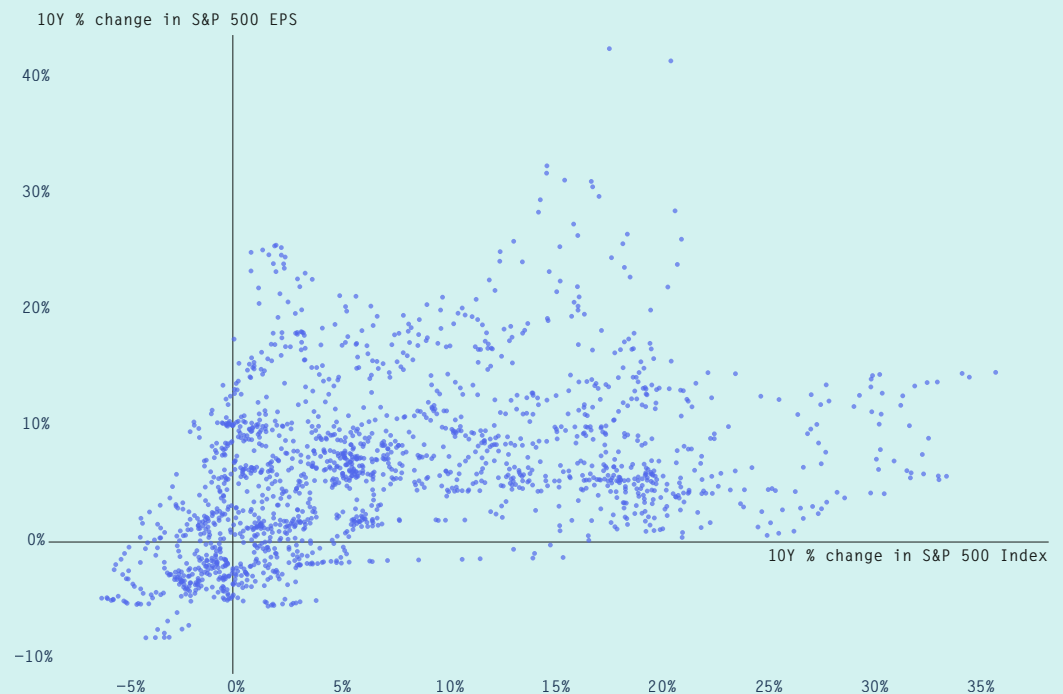


But, on a ten year view, EPS growth and equity markets are more closely linked.

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?

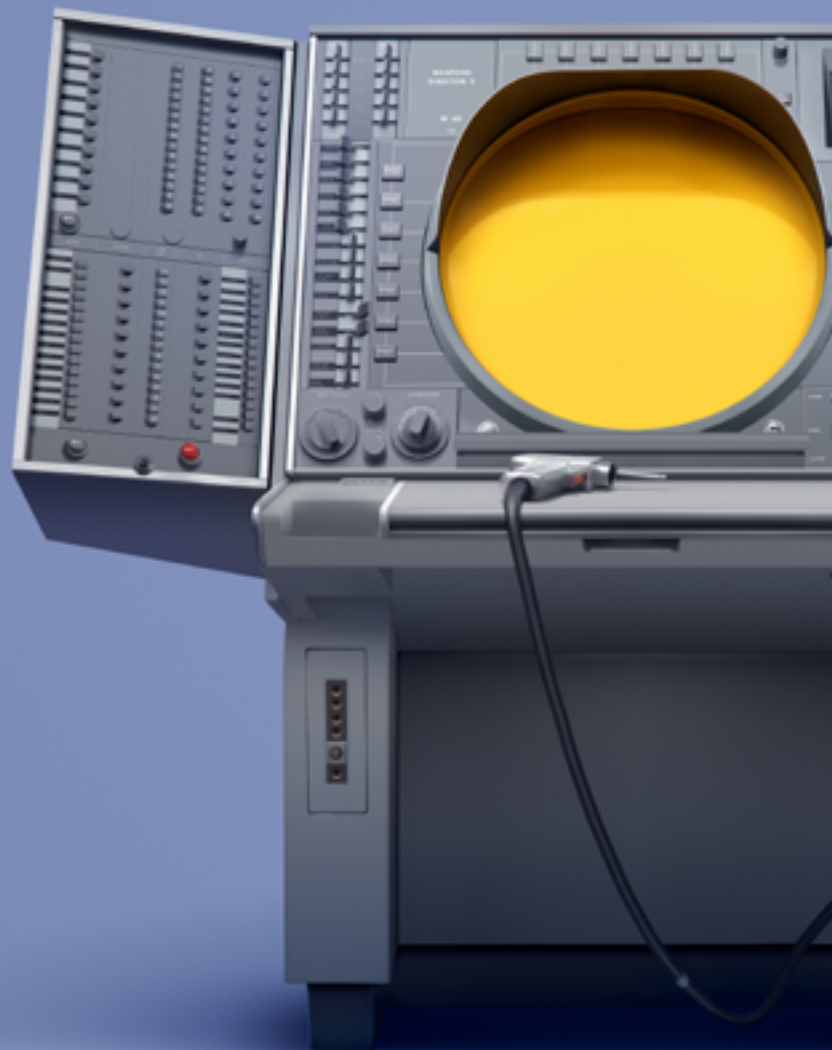
Developed by Richard Grinold and Ronald Kahn, the fundamental law of active management states that an active investor's success depends on two things: their skill in picking winning bets; and the number of bets they can make.

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.

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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

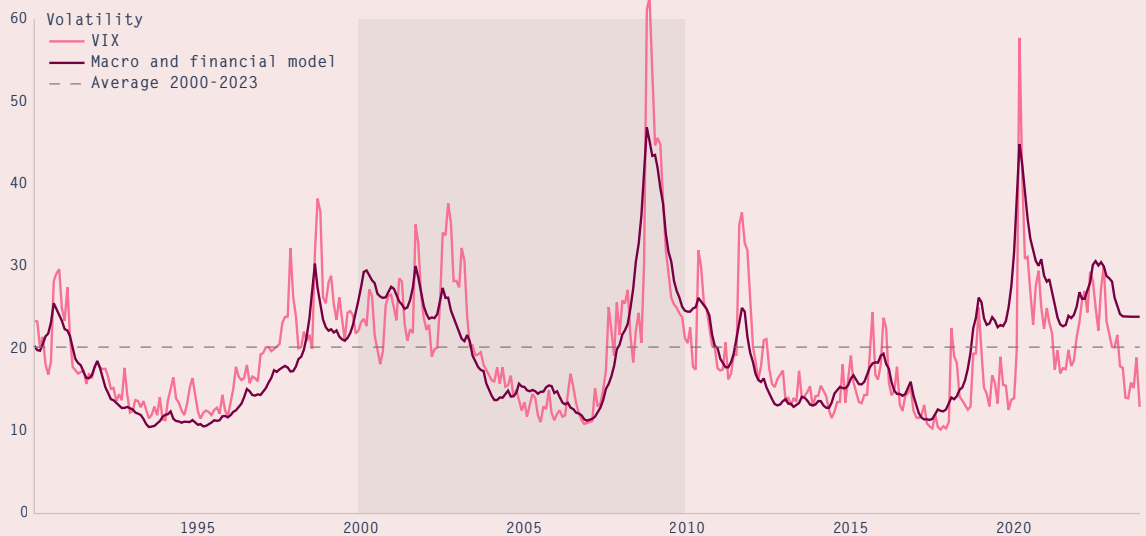
As a result of these dynamics, we expect there will be more longer-term fundamental opportunities for the skilled active investor. One example we consider in portfolios today is implied volatility – the CBOE Volatility Index (VIX), also known as the fear gauge. We track a fundamental model that explains 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.

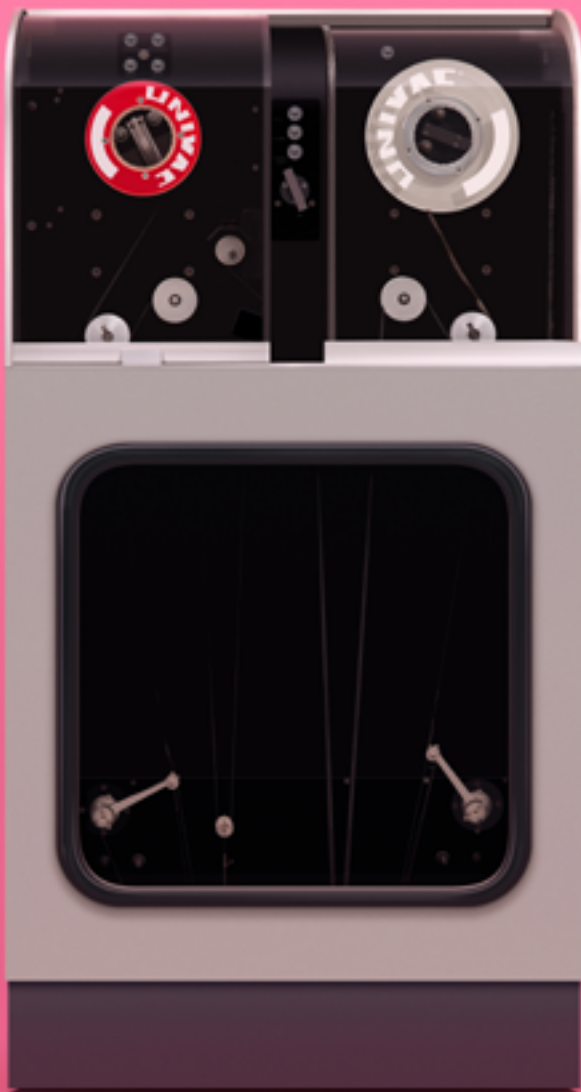
Take inflation – its recent rise and subsequent fall caught many investors off guard, and the impact of rising inflation on asset prices was quite poorly understood. In caricature, if an inflationary episode has never occurred in your data set, your data-driven approach is not going to know what to do. 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.

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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 Lefèvre’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 (oDTE) 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. ●