

# Informational Dissonance and Artificial Intelligence

Using AI to Harness a *Metric*  
of Contemporary Society

**Plotinus**   
Asset  
Management

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## Using AI to Harness a Metric of Contemporary Society

- At Plotinus Asset Management understanding the creation and deployment of AI technology for use in trade decision-making is at the core of what we do.
- We believe that advanced technology can be used to generate approaches that create new windows of opportunity to invest, particularly in existing asset classes. These can act to provide yield additions to investors' portfolios. This is a new approach, taken from first principles, rather than simply using technology to better financial engineer what someone else has done beforehand.
- Through our use of derived data, we seek to decant meaning from that data within the framework of targeted, task-based AI. This in our opinion is where AI is best exploited in the sphere of asset management.
- To do this, one must understand the context in which one intends to use AI, in order to discipline the method and avoid the temptation to use excess data and excess processing just because the capability to do so exists.
- This paper explores the broader philosophical, critical thinking and analytic insights necessary to properly fashion AI trade decision-making strategies and products. We contend that asset managers can benefit impressively from these innovations.

## Contextual Reality

With the continuing development of artificial intelligence, there is the ability to construct interpretations of the world around us that are not necessarily bound by the same conventions that we use to define objective reality. Furthermore, the presence of a subjective reality for a machine (beyond that of its creators) is questionable. This leaves us with a different reality, one which some fear could lead to a utilitarian nightmare where machine decisions, devoid of our humanizing tendencies will create an inhumane world. On the contrary some might argue of course that, that may not be such a bad thing considering that our human tendencies unlike those of our fellow animal species, have led to the most despicable atrocities witnessed by our planet.

Conventional understanding separates the experienced world into two viewpoints: the subjective world (that of the individual) and the objective world (that which is common to all). So prevalent is this way of thinking that we may not realize the extent to which it has been a matter of philosophical debate throughout the ages. It is easy to accept and understand the subjective component, we each have a unique eye on the world so to speak. How though we arrive at the objective is strangely through convention. It is a tacit, mostly unspoken, absorption of a normative description, of a collective overlapping perspective. This spans not only our immediate collective (peers, community, nation, world) but also prior historical versions of said collective. In short, we have a highly complex layering of realities, that help define the objective. We have managed to complicate this by invoking language and concepts with moral overtones such as truth and fact, that blur the matter further.

This may all be very interesting but what is the relevance of any of this one might ask to investment management?

AI has crept into every facet of the technological world around us, including investment management. The different perspective that it gives in the interpretation of information, brings with it the ability for investors to benefit from that advantage. When deployed correctly it offers investors a new manner of diversification away from both traditional and alternative approaches. Perhaps most interestingly, this can be done within traditional asset classes, giving investors new windows of opportunity in areas in which they are already invested in a conventional manner.

It is when one considers this, that suddenly the unravelling of the conventionality of what we take to be objective facts becomes an important part of this new investment approach.

The more we can decontextualize the objective 'fact' the more we discover its contextuality which, in the first instance, may not be easily recognizable. Some AI techniques enable us to do this better than others. The informational nature of data allows for a detachment from convention, not dissimilar to the qualities that the provision of the imaginary number gives to mathematics.

Thus, with the ability to construct new perspectives one can then begin to layer these to form different objective realities. Again, it is best to avoid using judgmental terms such as right and wrong in relation to this process and simply stay with different. Having different perspectives allows one to check conventional wisdom and may in some situations detect inconsistencies, or a lack of coherence, which when performed in the context of investing can reveal actionable opportunities that otherwise would remain unseen.

## Our Approach at Plotinus

We can isolate key data to be interpreted using a unique analytic process to search for a metric which we have termed "Informational Dissonance". The concept relates to derived-data data mining from digitalized information, enabling a new analysis of rational systems.

"Informational Dissonance" can be used to provide additional tradeable information from financial data. It can measure how some financial data can deviate from reality whilst remaining internally coherent.

There is a trading opportunity when this internal coherence is assumed erroneously to be the same as correctness.

Having this analytic strength gives us a trading edge.

## Homer, the Bard of Avon and Beyond

Humans love a good story and have done so it would appear since the dawn of time. In our efforts to understand the world around us we have used the narrative process to help explain and contextualize that understanding. It is important to recognize that regardless of how advanced we may see our contemporary society, we remain as wedded to the power of storytelling as the ancient Greeks with their heroic mythologies or the Tudor English with their Shakespearean dramas, as illustrated by the multibillion-dollar entertainment industries of Hollywood and electronic gaming.

More important and much more nuanced however is the storytelling that fills daily life, that in which we participate, both individually and collectively. These stories are used to provide meaning, explain things and to help situate ourselves. The problem is that individually and collectively we are prone to fluffing the tale. To add to the confusion, we have to contend with each and every participant's (and combination of participants') interlaced agendas, gullibility, connivances etc. Then of course there is the problem of reliability and the tendency to create stories as a self-fulfilling prophecy when we chose to fudge the distinction between *a priori* and *a posteriori* knowledge.

The two biggest news issues of the year were the corona virus pandemic and the presidential election. But just how far can this narrative be taken?

To take a relatively simple example. In the context of the United States, given the news flow of 2020, it was easy to discern that the two biggest news issues of the year were the corona virus pandemic and the presidential election. But just how far can this narrative be taken? The following chart shows this premise from a different perspective.

It takes a different angle on that news flow, instead of looking at news media data of topic coverage it chooses instead to look at a somewhat less filtered starting point, US Google searches – where at least the point of initiation is self-determined by the general populous, to which we must add a major caveat in relation to what this itself actually reflects, a question we will explore later in this paper.

## "Don't Believe Half of What You See - None of What You Hear" Market Interpretation of the Two Most Dominant Media and General Google Searches in the United States 2020

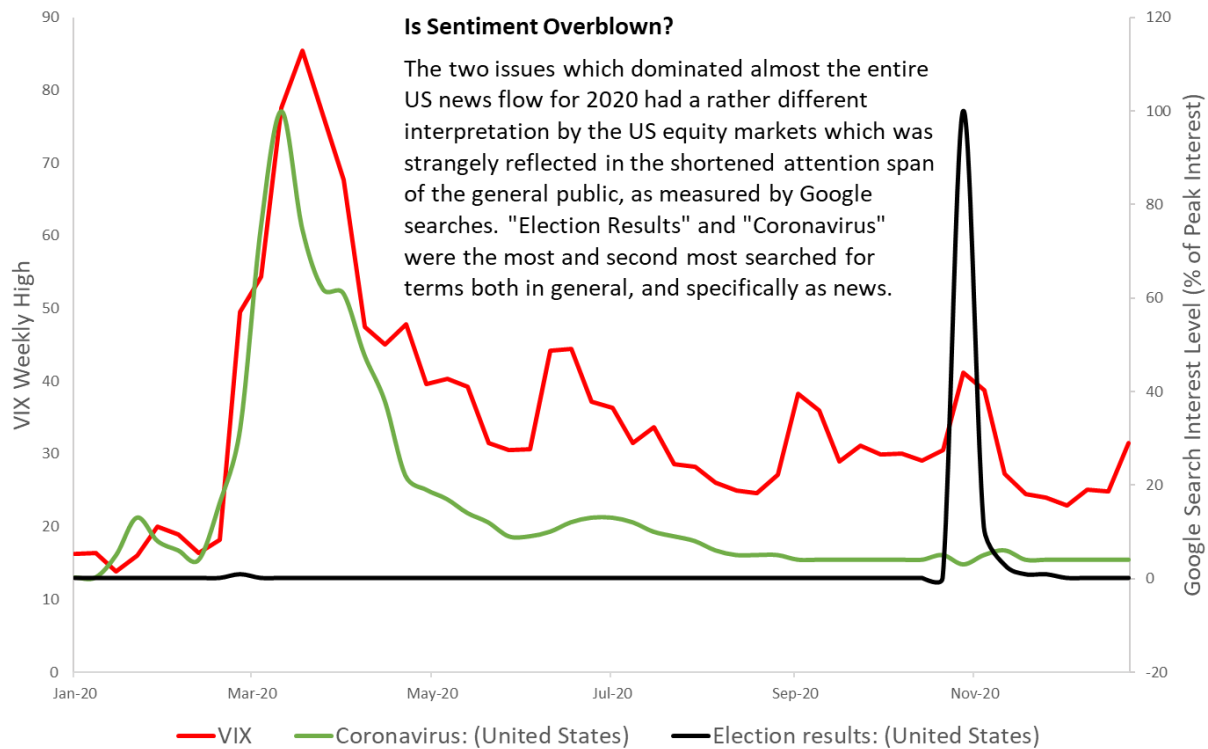


Chart: Plotinus Asset Management, Data: CBOE, Alphabet Inc.

The two lead searches in the US for 2020 were unsurprisingly the corona virus and the US election. The interesting thing though is the duration for which they were relevant. The corona virus interest levels peaked in March during the first wave with a mild re-occurrence with the summer coinciding with the spread across states that had missed the first wave in spring. Then despite all of the superspreading news discourse that surrounded the Thanksgiving holiday it barely stimulated any interest.

The attention on the election was restricted to the immediate period around election day in November, reflecting that the unfiltered public interest was very specifically focused on the actual election event itself.

In looking at one measure of the relevance that this perspective had for the market the CBOE volatility index (VIX) is used to illustrate investors sensitivity to these two very

uncertain and potentially tumultuous news stories. The clear observation is that the public interest as measured by the Google searches parallels the increase in the VIX and slightly preempts its decline.

These are crude measurements but what is interesting is that as such they manage to strip things down to a basic form which can be much more illustrative than the most elaborate sentiment analysis which can fall into chasing its tail, particularly in the climate of 'fake' and 'un-fake' news, where authenticity, and priority is determined by algorithms that tend to value established media outlet's credentials while failing to fully bear in mind that the *raison d'être* and primary sell of a media outlet is interesting news. It is not the most advisable premise to ignore the gut instinctual behavior of the crowd or of the markets. Such wisdom may not necessarily have at first glance the rationality that we might otherwise like to have in a smooth storyline.

**The metric created by the dissonance between perceived public newsworthiness and a type of actual public interest, is tradable.**

This simplified example is an illustration of what we term informational dissonance.

The metric created by the dissonance between perceived public newsworthiness and a type of actual public interest, is tradable. The inverse of the drop in the public interest in a news fueled market crash providing the edge to catch the bottoming out of the US equity markets in March and subsequent recovery into the summer.

## Critical Thinking

The attraction of AI trade decision-making is that it offers the possibility of generating autonomous assessments of the market, separated from the potential frailties of impulsive human decisions which in the market context are almost always made under intensive pressure. This expectation must however be tempered by the understanding that these autonomous decisions don't magically appear, they are the products of the architecture of the system that is making those decisions. Even in self-propagating systems that build their own decision-making pathways, the start point of such propagation is determined by its human creators, regardless of how distant they become from the final decisions. These processes like many others do not escape the trap of 'garbage in, garbage out'. Without a philosophical thoughtful approach behind it, the use of AI is just another potshot method. To be clear this does not mean that such an approach cannot produce correct results for some period of time. If this correctness is arrived at with little or no understanding as to how it has been arrived at, then when it ceases to be correct the reasons as to why, will remain just as elusive. In certain fields of application where being wrong is inconsequential or part of a trial, or guessing process to test what works and doesn't work, this approach can be very useful. In investment management there is a very small tolerance level to getting things wrong. Hence for AI to be used successfully in trade decision making we are of the opinion that this must be used in a circumspect, limited and highly focused manner – task-based AI.

In order to do this there has to be a human understanding of the how, what and why of what you are setting out to achieve. Once this has been obtained – the system can harness all of the advantages of AI technology to seek out, distill and determine those elusive latent trading opportunities. In effect it is a highly specialized tool not a generalized artificial brain.



The world is changing. Artificial Intelligence is the next threshold moment in the development of technology. Across all sectors of industry this technology is transforming the way business is done.

Plotinus provides investors with the opportunity to avail of AI technology and bring an AI strategy into their portfolio.



Plotinus Asset Management serves qualified investors with financial approaches that exploit artificial intelligence. It provides investment advice and fund services to institutional investors and private clients.

Plotinus Asset Management is a Cayman Islands registered fund manager established to deploy the proprietary AI trading technology of Plotinus Ltd. It is registered with the US Commodity Futures Trading Commission as a Commodities Trading Advisor and as a Commodities Pool Operator. The firm is a member of the US National Futures Association.

**plotinus.ai**

Plotinus Ltd is a Northern Ireland-based AI advanced technology firm founded in 2013 with the support and backing of Invest Northern Ireland, a UK Government Regional Development body, and the EU European Regional Development Fund.

## Identifying and Understanding Myth

Technology is so ubiquitous in our contemporary society that we can make several false assumptions with regards to it. The internet, it is sometimes said, has democratized knowledge. The internet has certainly had the effect of cheapening knowledge but is it a claim too far to say that it has democratized it?

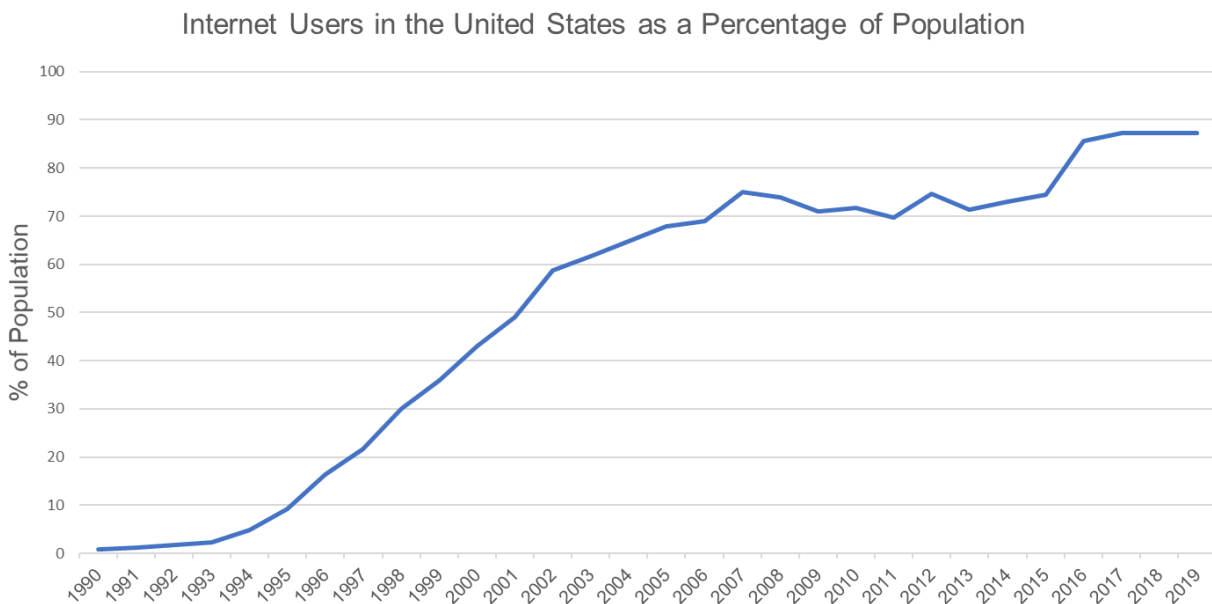


Chart: Plotinus Asset Management, Data: World Bank

Looking at the above chart the answer would appear to be no, with 87% of the US population using the internet as of 2017. It is necessary, of course, to look below these first surface impressions.

According to 2017 data associated with the OECD Program for the International Assessment of Adult Competencies (PIAAC), only 31% of adults in the United States could be classified as being competent in problem solving in technology-rich environments. It defines this as, *“using digital technology, communication tools and networks to acquire and evaluate information, communicate with others and perform practical tasks”*. It focuses on *“the abilities to solve problems for personal, work and civic purposes by setting up appropriate goals and plans, and accessing and making use of information through computers and computer networks”*. Problem solving in technology-

*rich environments does not measure the cognitive skills required to solve problems in isolation. It measures both problem-solving and basic computer literacy skills (i.e. the capacity to use ICT tools and applications). This is done by assessing how well adults can use ICT tools and applications to assess, process, evaluate and analyse information in a goal-oriented way.”<sup>1</sup>*

Instead of access to knowledge, internet access for this group is more akin entertainment carrying broadcast media but with the veneer that one’s personal input matters.

This puts the internet access figure somewhat in context, if such a high proportion of the population is unable to avail benefits of using technology to help them solve problems then how are they able to avail of the vast access to knowledge (in theory) that the internet represents? Instead of access to knowledge, internet access for this group is more akin entertainment carrying broadcast media but with the veneer that one’s personal input matters. This is something that is progressively being reflected in the advertising revenues of the tech giants with online video, making up 47% of all online advertising in 2020 (with YouTube and Facebook accounting for almost half of this).

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<sup>1</sup> OECD (2019), Skills Matter: Additional Results from the Survey of Adult Skills, OECD Skills Studies, OECD.

## Systemic Inequality

It is not a coincidence that this 31% figure is closely related to socio-economic/educational demographics. The US Census Bureau estimates 32.1% of the US population over the age of 25 hold a bachelor's degree or higher<sup>2</sup>. When the relative earnings of this group are compared with the general full-time working population over the last twenty years it shows a shocking level of disparity in income growth. During this time the haves of the educated grouping have seen their earnings growth more than quadruple by comparison to the average worker. Given the dependence of the US economy on consumer spending it is noteworthy on how reliant on the upper third that consumer spending is, particularly in the discretionary spending sector.

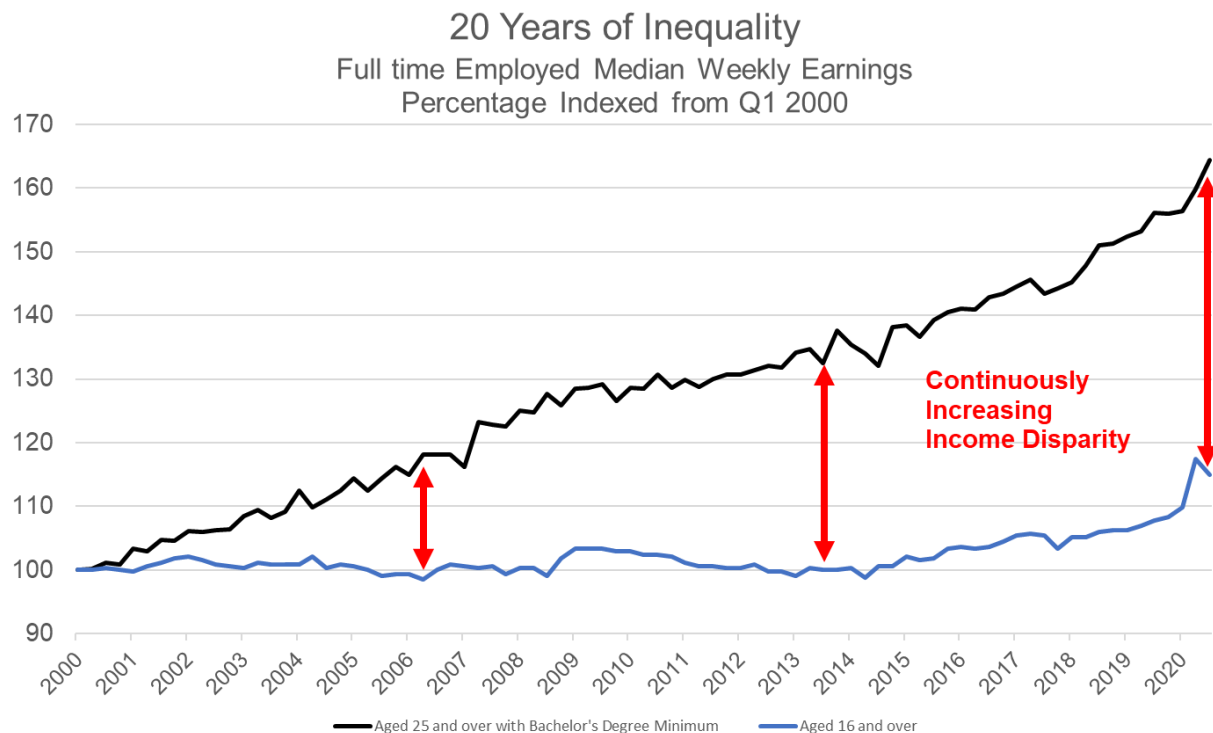


Chart: Plotinus Asset Management, Data: US Bureau of Labor Statistics

For those inclined to consider its political implications, the chart above, speaks for itself. It explains the successful emergence of an anti-establishment figure. This is reflected

<sup>2</sup> US Census Bureau, Bachelor's Degree Attainment in the United States: 2005 to 2019.

further in the close correlation at a county level of percentage of population with a territory education and their voting preference in the recent US election. These are long term systemic problems, but the level of inequality is such now that ignoring it risks creating a complete bubble in which knowledge is feudal not democratic. If that situation is left unchecked, technology itself may lead to its long-term undoing.

There is much discourse on the effects that automation due to AI will have on society, but this discourse belongs to the occupants of the black line in the chart above, the blue line occupants have already had their encounter with automation which when it occurred decimated the blue-collar field. AI will strike the clerical white-collar world the hardest, as jobs and roles become obsolete. With this there lies the prospect of the lower section of that upper third who have grown up with the expectation of the entitlements of belonging to the black line group suddenly facing the prospect that they will no longer have the comfortable lifestyle they envisaged. This has the potential to form a political Molotov if mixed with the hurting and disgruntled existent working poor.

## **The Real Retail Revolution**

It has been hard to ignore all of the recent focus on the so-called retail trader revolution as we have watched over the past months a cycle through everything from Hertz to Gamestop. As per the previous discussion on the democratization of knowledge myth, it is vital to be able to step back and attempt to discern what is really going on. It is difficult at times to identify what is happening to avoid being sucked into the story, this is particularly the case where the story itself is manifesting actualities, for example Gamestop Corp. stock did hit an intraday high of \$483 on January 28, 2021.

The raw statistics of failure among active retail traders like the well-worn 90/90/90 rule<sup>3</sup> should be remembered. As the news flow rushes on by it is easy to forget that with Gamestop Corp. stock at time of this writing trading in the \$41 range (below their pre-January surge level) that someone has been on the losing side of the trade of this -92% devaluation.

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<sup>3</sup> The proverbial rule of thumb that 90% of new non-professional traders lose 90% of their money in 90 days.



A much-cited figure from Citadel's head of execution services<sup>4</sup> in July last year that there had been a twofold increase in the previous 12 months in US retail investors' share of stock market activity. Making up 20% in 2020 vs 10% in 2019. Considering Citadel's position in retail focused trading platforms this increase is of significant benefit to them so they cannot quite be considered an independent observer.

Stepping away from all the euphoria and devastation of this 'revolution' perhaps we should look at a much more fundamental (and boring) revolution that has occurred in retail investing. The SEC assessed in 2020 that what they refer to as Main Street investors (read retail investors) held 58% of the US equity market<sup>5</sup> thus by extension therefore, they account for 58% of all stock market activity.

This data does not suggest any sudden flight from stodgy, dull investments to the attractions of wild day trading.

According to the Investment Company Institute in their annual report for 2020, 45.5% of all US households hold shares in a mutual fund, and households are the largest investor group in funds and registered investment companies and funds and investment companies, accounting for 23% of household wealth in 2019 (compared with 3% in 1980).<sup>6</sup> Also in the same report it is noted that 89% of households invested in mutual funds are confident mutual funds can help them achieve their investment goals.

This data does not suggest any sudden flight from stodgy, dull investments to the attractions of wild day trading. Though it will not stimulate many headlines, the real retail trader revolution is slow moving. It is that these retail investor fueled, dull investments, are like all US equity investments continuing to drift away from active and into passive investments. This represents an area where AI trade decision-making strategies can have a significant impact as they create opportunities with different active approaches to generate new types of passive style investing.

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<sup>4</sup> Bloomberg TV Interview with Joe Mecane, July 9, 2020.

<sup>5</sup> Securities and Exchange Commission, Dec 18, 2020.

<sup>6</sup> Investment Company Institute, Investment Company Fact Book 2020.

## In Summary

The search for improved yield continues to be the main concern for the asset management industry. Despite 2020 being a deeply disturbed year, the US equity indices had, by any standards, a year of good returns, which presented another strong argument in favor of passive index investing. With many active managers continuing to underperform those index benchmarks, investors looking to improve their alpha, require new approaches.

AI strategies are where that new edge is to be found. Investors and allocators are educating themselves in this new field. As they consider how to include these approaches in already carefully constructed portfolios, they should be able to find investment processes that they can easily assess and qualify, regardless of AI's newness.

As we have explored in this paper, investors must be able to find a depth of thought – philosophy and critical thinking behind the creation and application of AI specific to asset management. We offer the kind of intellectual rigor that investors would expect from any fund manager with an innovative product.

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The Plotinus 2π Enhanced Index is offered as a complete managed futures program comprised of an active, passive and bonds or cash investment as a replacement for a purely passive S&P 500 Index tracking investment. It is offered to investors in two forms, as a Cayman Islands regulated fund offering and as a program for separate managed accounts. For the fund version Plotinus Asset Management will oversee the deployment of the bonds or cash component on behalf of the investor. For the separate managed accounts version, the deployment of the bonds or cash component of the program is the responsibility of the investor. Where relevant USD 1-month LIBOR rates have been used to illustrate a basic cash deployment.

Plotinus Asset Management is happy to discuss how we invest and explain in detail our investment methodology, please feel free to contact us to schedule a conversation.

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