AI and the Art and Science of Asset Allocation

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Harnessing the power of artificial intelligence and data science has become increasingly important in today's fast-paced and ever-changing investment landscape. As investors look for more personalized, simple, and efficient solutions, Lumenai has effectively ushered in a new era of intelligent investing with its innovative AI-based investment portfolios, which are powered by self-learning algorithms and adaptable strategies. One such strategy, "GO Long," has already established an impressive track record, demonstrating the immense potential of AI to generate superior, risk-adjusted returns.

GO Long was the first AI-powered investment portfolio created by Lumenai for a senior hedge fund executive two and a half years ago. Go Long is a globally diversified, self-learning, self-adapting asset allocation portfolio. The portfolio can "go" anywhere, hence its name, and invests in quality global large and midcap stocks, bonds, credit, commodities, and cash.

GO Long was designed to outperform a traditional 60% MSCI World Index / 40% Bloomberg Barclays US Bond Aggregate Index benchmark over 3, 5, 7, and 10 years in terms of cumulative and annualized net returns. It seeks 2-4% alpha, a higher Sharpe ratio, and a smaller maximum drawdown than the benchmark.

How did artificial intelligence perform?

We believe AI performed admirably. As of April 30, 2023, GO Long outperformed its benchmark in both bullish and bearish calendar years, as well as across all rolling periods:

Time Period	GO Long vs. 60/40	Outperformance
2021 (a bullish year):	+18.0% vs. +9.1%	+8.9%
2022 (a bearish year):	-15.9% vs. -17.0%	+1.1%
2023 YTD (bullish so far):	+10.0% vs. +6.8%	+3.2%
MTD (April):	+2.2% vs. +1.1%	+1.1%
YTD (April):	+10.0% vs. +6.8%	+3.2%
1-Year:	+3.9% vs. +0.7%	+3.2%
2-Year (annualized):	+1.6% vs. -3.9%	+5.5% per year
Since Inception (annualized):	+3.9% vs. -1.4%%	+5.3% per year

Since inception, the AI-driven portfolio has outperformed a traditional 60/40 portfolio by an annualized +5.3% through April, generating positive cumulative returns during a time when the benchmark lost money.

How did the AI generate these returns?

As it turns out, the lion's share of returns resulted from alpha, i.e., investment skill, rather than market exposure, such as to ETFs or passive indexes. GO Long has a beta of 1.03, indicating that its volatility is 103% that of the 60/40 benchmark. However, rather than falling -1.41% per year like the benchmark, Go Long INCREASED by +3.9% per year over the same timeframe thanks to its self-adapting active management.

That means the AI generated an alpha of +5.6% per year, adding value through both security selection (picking stocks that outperform) and asset allocation (timely changes to asset classes or sectors).

- Alpha +5.6%
- Beta 1.03

What changes did AI make to the portfolio's asset allocation?

For most of 2021, the AI identified fundamental data and market patterns that favored an overweight position in global stocks. These patterns were characterized by strong earnings growth, quality balance sheets, positive momentum, low inflation, low interest rates, and low market volatility. This started to change in September 2021 and again in July 2022, when the AI increased its allocation to gold and commodities, and then to gold, commodities, and bonds. Specifically, the AI detected inflation, rising interest rates, and stock market volatility. In September, the AI model continued to reduce stock exposure in favor of short-term and adjustable-rate bonds and gold, before equity exposure bottomed out in October 2022.

In November 2022, the trend began to reverse as AI increased its allocation to equities at the expense of bonds, and it continued in December 2022 when it sold commodities in favor of stocks. This positioned the portfolio to profit from the equity rally in the first quarter of 2023. Since then, the AI has somewhat lowered its exposure to stocks and broad commodities while increasing its allocation to ultrashort, short-term, and adjustable-rate bonds.

Currently, GO Long is underweight equities and broad commodities, while overweight ultra-short and short bonds.

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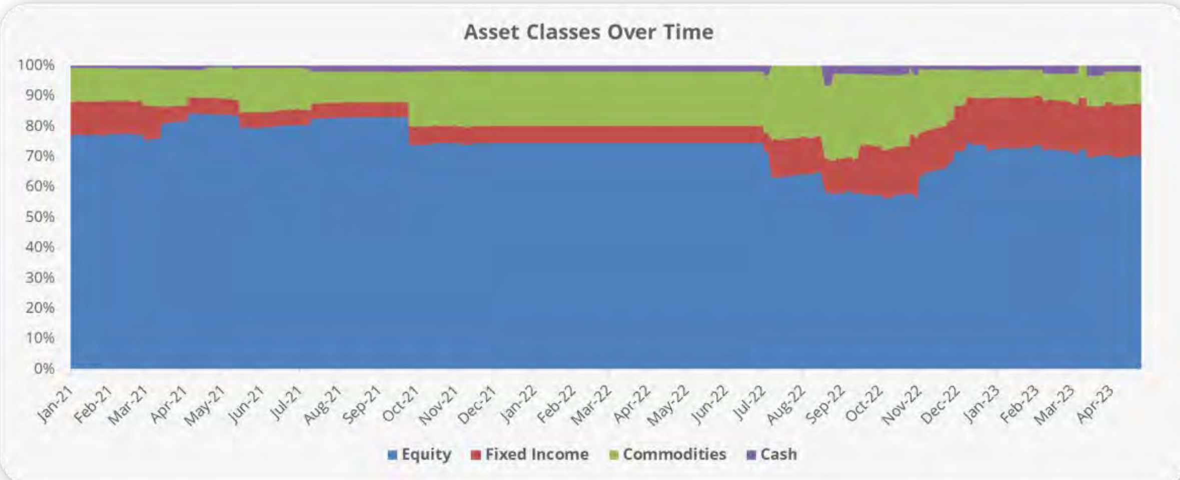
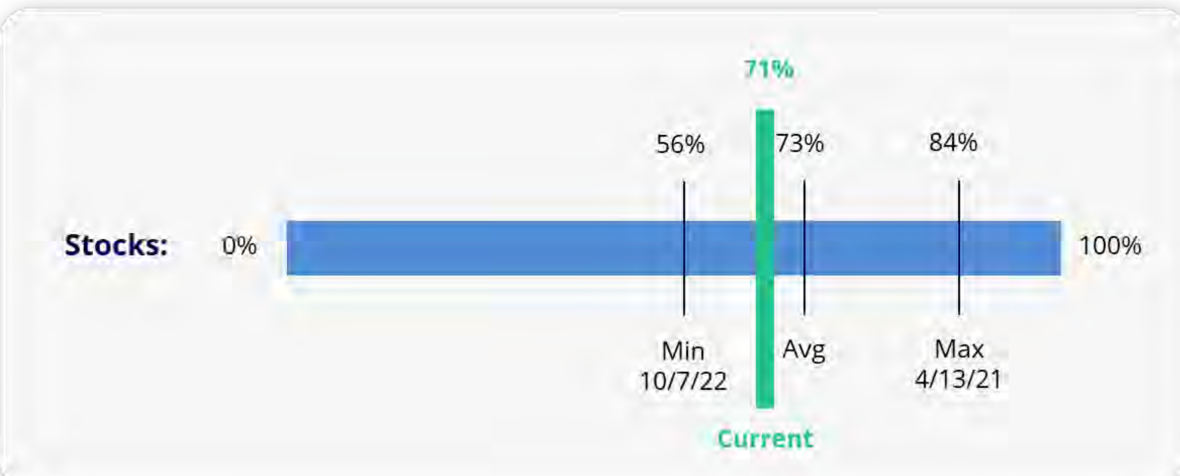
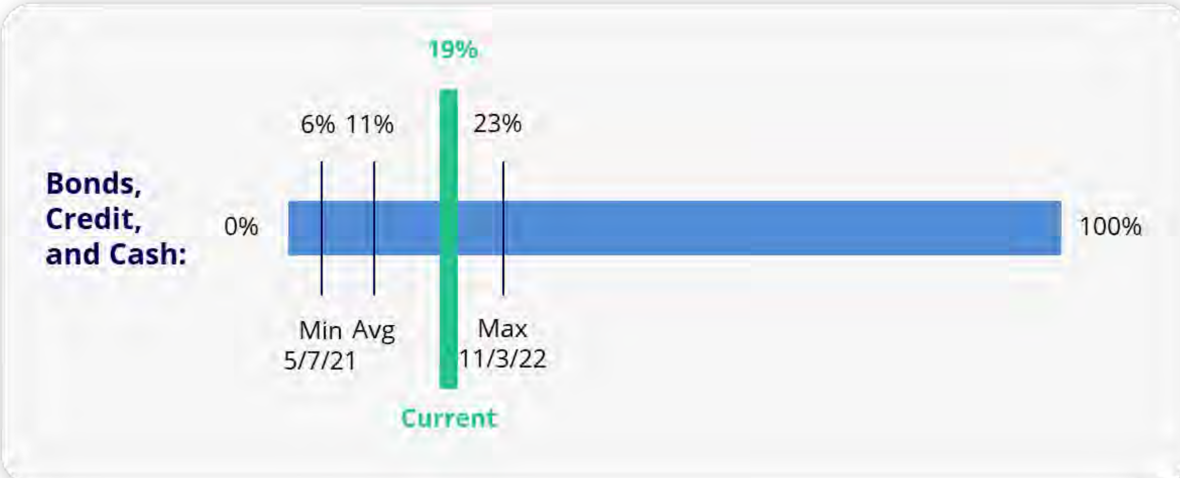


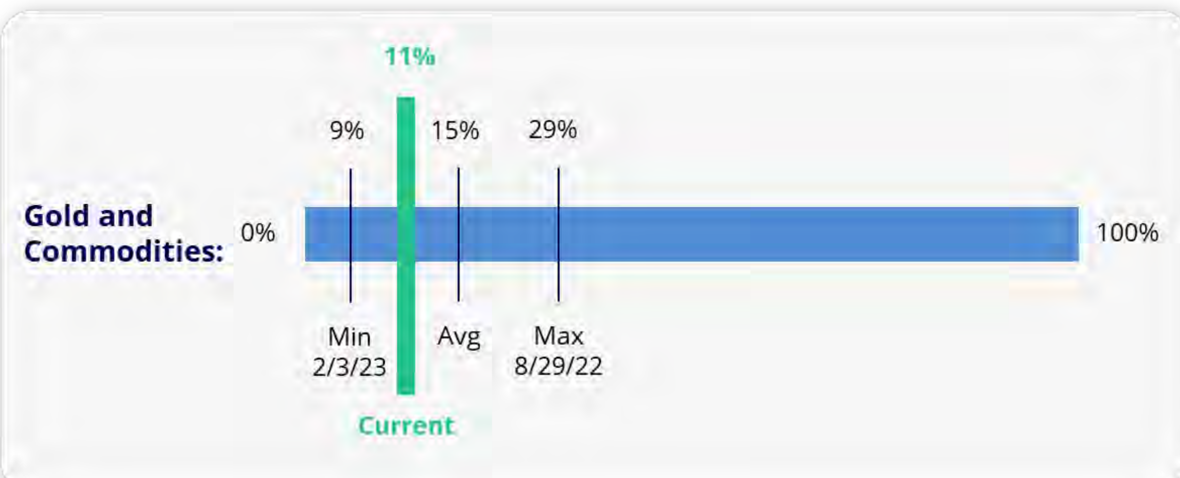
GO Long is an equity-led strategy that has averaged a 73% stock exposure over the last two and a half years thanks to generally favourable conditions. During that period, equity exposure ranged from 56% (October 7, 2022) to 84% (April 13, 2021). Currently, equities constitute 71% of the total portfolio, a modest decline of 3% since the portfolio's peak of 74% on February 3, 2023.



Fixed income, credit, and cash exposure constitute a modest 11% of GO Long on average, but are today 19%, with 2/3 of its exposures in short and ultra-short-term Treasuries and municipals. The remaining one-third of fixed-income exposure is in intermediate Treasuries and the core bond aggregate. The fixed income exposure is driven by duration and inflation models, which continue to recommend below-average interest rate risk exposure.



Commodity exposure includes gold, precious metals, and broad commodities such as oil or industrial metals. In general, gold and other precious metals serve as portfolio diversifiers, thereby enhancing risk-adjusted returns. Broad commodities, on the other hand, are more of an inflation hedge that can also improve risk-adjusted returns. On average, commodity exposure is 15% of the portfolio, but it has been as low as 9% in February 2023 and as high as 29% in August 2022. GO Long's current allocation to commodities is 11%, which is underweight, with 6% allocated to gold and 5% to broad commodities.



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Conclusion:

The performance of GO Long, an investment portfolio powered by artificial intelligence, demonstrates the potential benefits of incorporating AI into asset allocation-focused portfolios. Despite challenging market conditions, GO Long has consistently outperformed its benchmark thanks to its self-learning and self-adaptive capabilities. Using data science and AI, investment professionals can pursue higher alpha, enhance risk-adjusted returns as measured by the Sharpe ratio, and mitigate maximum drawdown risks. GO Long's success demonstrates the value of active management supported by advanced technologies, providing investment professionals with a valuable tool to navigate future market uncertainty and potentially enhance client outcomes.

About Lumenai

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From traditional to alternative investments, our mission is to use data science and artificial intelligence to make it easier to build smarter portfolios that take less time to manage.

Lumenai. Invest with Intelligence.

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