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TalkingPoints

Using AI in Index Construction with 3AI

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1. Could you please introduce 3AI and share your company's mission?

3AI is an artificial intelligence (AI)–driven investment intelligence company focused on systematically identifying and supplying forward-looking alpha to the investment industry.

We describe 3AI as an alpha refinery: a new type of business that combines large, complex datasets with deep subject matter expertise in investing and proprietary machine learning to mine forecast investment insight. That refined alpha is delivered in scalable, usable forms, including indices.

3AI originated from an award-winning data science team whose self-learning investment AI achieved national recognition in the U.K. in 2017. The technology was deployed to trade billions of dollars and generated insights adopted by the chief investment officer of a large insurer. At that time, we rejected a proposal from the insurer to spin out, choosing instead to form 3AI.

The team combines decades of institutional asset management experience with deep expertise in machine learning and applied data science. Over time, the system repeatedly demonstrated an ability to forecast stocks with accuracy materially greater than would be expected by chance.

2. In your view, how is AI particularly relevant and ready for use within indices today?

Building on the first wave of automation introduced by indices, machine learning (a subset of AI) represents the next natural evolution in systematic investing. Traditional beta indices democratized access to broad market returns by offering low-cost, transparent solutions. Factor indices further advanced this by providing systematic, rules-based exposure to specific drivers of return, enabling more intentional portfolio construction. Today, machine learning enables a much deeper examination of factors or financial data. By learning from history and applying that learning to current information, AI models can generate forward-looking perspectives. At 3AI, we refer to this as Alpha Intelligence. In essence, we use machine learning to compress deep factor understanding into a single intelligent factor, i.e. a model that adapts to market conditions or stocks to craft a bespoke factor framework that compresses hundreds of factors into the one we really care about: alpha, or in other words, what could happen tomorrow.

We also believe that machine learning can be leveraged in investing to address core challenges such as model risk, overfitting, noisy and complex datasets, feature selection bias and point-in-time integrity. Advances in computing, data availability and algorithms now make this approach practical scalable, and robust for index applications.

Importantly, modern AI systems can also provide meaningful explainability. At 3AI, forecast alpha can be attributed to individual data inputs. Evidence from live markets, including indices tracking hedge funds, shows that AI-based approaches already outpace peers in both absolute and risk-adjusted returns even at this early stage. As data availability expands alongside algorithm and computing power advancements, the capabilities of AI are set to accelerate further. Together, these developments are powering an exponential surge in the power of AI.

3. What is machine learning, and what specific advantages, in your view, does it offer compared to traditional human-led data analysis?

Machine learning is a step change in automation, but it is fundamentally an extension of human intelligence, not a replacement. At 3AI, all systems are human designed and human governed, and our Alpha Intelligence is therefore deeply human led.

The key difference versus traditional analysis is that machine learning allows problems to be solved systematically and at scale, rather than repeatedly by humans. Algorithms encode humanity's best ideas about learning and optimization, amplified by computing to operate at superhuman speed and scale.

Investing is one of the most complex decision-making challenges that exists, involving uncertainty, vast choice sets and long-dated path dependencies. Machine learning offers clear advantages here, including the ability to retain and analyze vast histories of observed data, learn empirically without cognitive biases, operate at superhuman research speed, and detect complex interdependencies across markets.

At 3AI, this is complemented by a "learning about learning" layer that continuously evaluates how well models are performing in real time. Models must continually prove themselves to remain active, ensuring discipline and governance.

4. What are the 3AI Alpha Intelligence Scores?

The 3AI Alpha Intelligence Scores are 12-month forward-looking forecasts of relative total return at the individual stock level.

They estimate how a stock is expected to perform relative to its benchmark, where total return reflects what a shareholder actually receives, including price appreciation and distributions. Forecasting relative return is fundamental to both long-only and long-short portfolio construction.

Because the scores are already expressed as forward-looking relative returns, they can be used directly for ranking, selection and weighting in indices, without the need for factor translations, ratings or secondary models.

5. How can these scores be leveraged within indices, and why is the 12-month forecast horizon especially important within a passive framework?

For indices, forecast speed matters as much as accuracy. Signals that are too fast create excessive turnover and costs, while very slow signals lose relevance.

A 12-month horizon sits at the optimal point for index use. It aligns naturally with company accounting cycles, remains compatible with technical and market data, and avoids signal decay between rebalances. It is faster than traditional discretionary stock picking and more stable than short-term hedge fund signals.

This horizon also enables disciplined, rules-based adaptation. As forecasts update, stocks with deteriorating expected relative returns can be replaced by higher expected alternatives while remaining systematic and investable.

6. Could you provide an overview of how the 3AI Alpha Intelligence Scores are calculated? Is the process fully systematic?

The process is fully systematic in execution, operating within a human-designed and human-governed framework developed over decades of research.

At its core is a centralized intelligence network of specialized AI systems. Bottom-up models analyze company accounts, analyst information and market data to produce stock-specific alpha forecasts. In parallel, top-down sector and business cycle models estimate macroeconomic contributions to stock-level returns.

A final Bayesian believability layer learns how each model's forecasts relate to realized outcomes, adjusting for overconfidence and uncertainty. Upstream, a proprietary feature-engineering pipeline transforms raw data into machine learning ready inputs.

7. What validation procedures and degree of human oversight are incorporated into the calculation of these scores?

Validation of the 3AI forecasts is multi-layered and embedded across the full lifecycle of data, model training and live production. Particular emphasis is placed on ensuring that models are trained and evaluated on point-in-time accurate data, free from look-ahead and survivorship bias. All training datasets undergo extensive testing and remediation to confirm that only information available at the time of prediction is used, including explicit inclusion of stocks that subsequently delist.

Model training follows a rigorous walk-forward methodology, generating a long history of strictly out-of-sample forecasts across multiple market regimes. Validation focuses not only on statistical performance metrics, but also on forecast stability, feature behavior and consistency of results through time. Feature and forecast distributions, correlations and sensitivities are regularly analyzed to ensure they remain within historically observed and economically plausible ranges.

Once models are in production, a comprehensive set of data quality and signal integrity checks is applied on an ongoing basis. This includes monitoring universe stability, auditing raw data completeness and accuracy, validating feature correlations against historical norms and verifying that aggregate forecasts exhibit the expected week-to-week stability for long-horizon signals. Final pre-delivery completeness checks are performed prior to dissemination.

Human oversight is an integral part of the analytical framework and is focused on validation, governance and interpretation rather than discretionary overrides. Experienced quantitative researchers oversee feature development, model design and changes to the modeling framework. Explainability and diagnostic tools, including feature attribution analysis, are used to interpret and review individual stock-level analytical outputs and aggregate model behavior.

Ongoing validation includes monitoring the statistical relationship between historical analytical outputs and subsequent realized outcomes using established statistical testing methodologies. The framework applies rigorous statistical significance and robustness thresholds designed to assess whether observed relationships are unlikely to be attributable to random variation and to support disciplined evaluation of model reliability over time.

This combination of systematic statistical validation, economic sense-checking, continuous monitoring and structured human oversight aims to ensure that the forecasts are robust, repeatable and governed in a manner consistent with institutional client and regulatory expectations.

8. As AI adoption increases and more assets track indices using your scores, do you foresee the potential for alpha generation diminishing over time?

We do not expect near-term alpha erosion. The scale of opportunity identified by our systems materially exceeds what any single strategy or index can exploit. In 2024, our bottom-up stock models alone identified approximately USD 7.2 trillion of gross alpha opportunity under a theoretical framework of quarterly rebalancing long-short (without leverage) our global stock coverage.

Because coverage spans around 20,000 global equities, strategies constructed across regions, sectors and constraints tend to have limited overlap. The system also self-corrects: if adoption increases market efficiency, forecasts automatically adjust to new prices.

Importantly, we observe that forecasting accuracy improves over time as models learn across market regimes. While long-term market efficiency may eventually compress returns, as long as some predictability remains, forward-looking intelligence should outperform purely passive approaches.

9. How has 3AI addressed the “black box” nature of machine learning through its dedicated attribution tool?

Explainability is a core design principle at 3AI. Our systems generate detailed, structured attribution analysis for every stock, decomposing forecast alpha back to underlying drivers across both bottom-up and business cycle models.

This explainability layer sits on top of our proprietary Alpha Intelligence that discovers new investment insight from data, rather than recombining existing human knowledge. The result is a systematic, auditable and scalable framework that transforms advanced machine learning from a perceived black box into a governable tool suitable for index construction and institutional use.

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