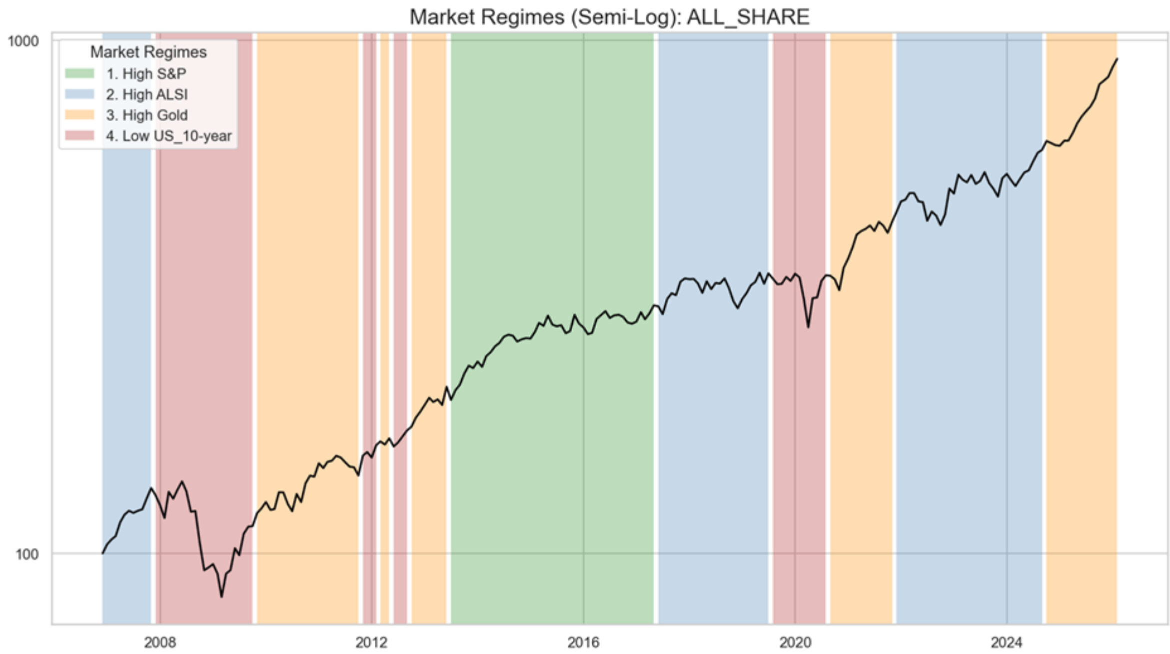
APPENDIX: SYSTEM DIAGNOSTICS

Data Visualisations & Methodology

The following outputs were generated during the January 2026processing cycle.

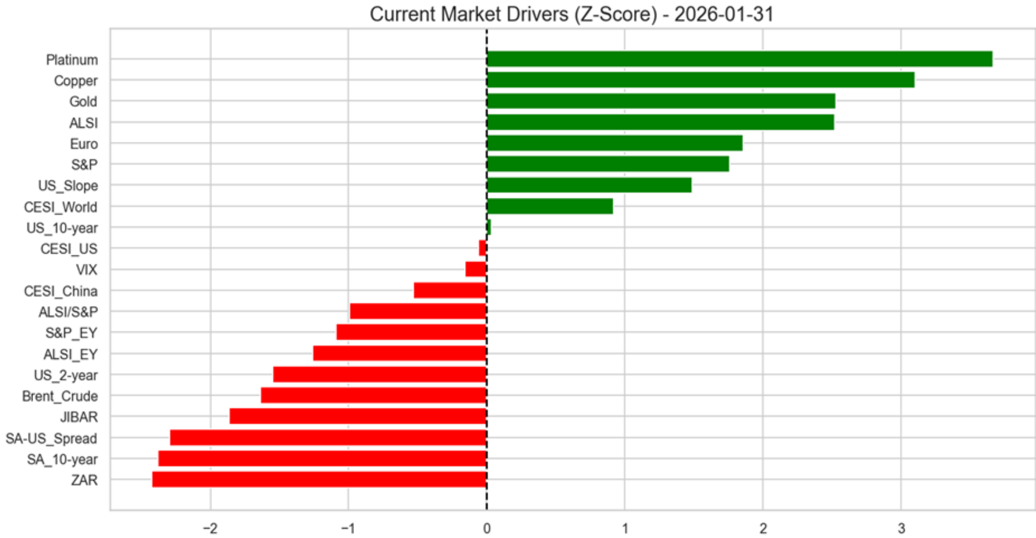
A. Regime Map (Temporal State Analysis)



System Note:

This semi-logarithmic chart tracks the JSE All Share Index against identified market regimes. The persistent **"High Gold &Commodities"** block on the far right indicates a stable, high-conviction trend in resource prices, despite broader market volatility.

B. Input Drivers (Deviation from Trend)

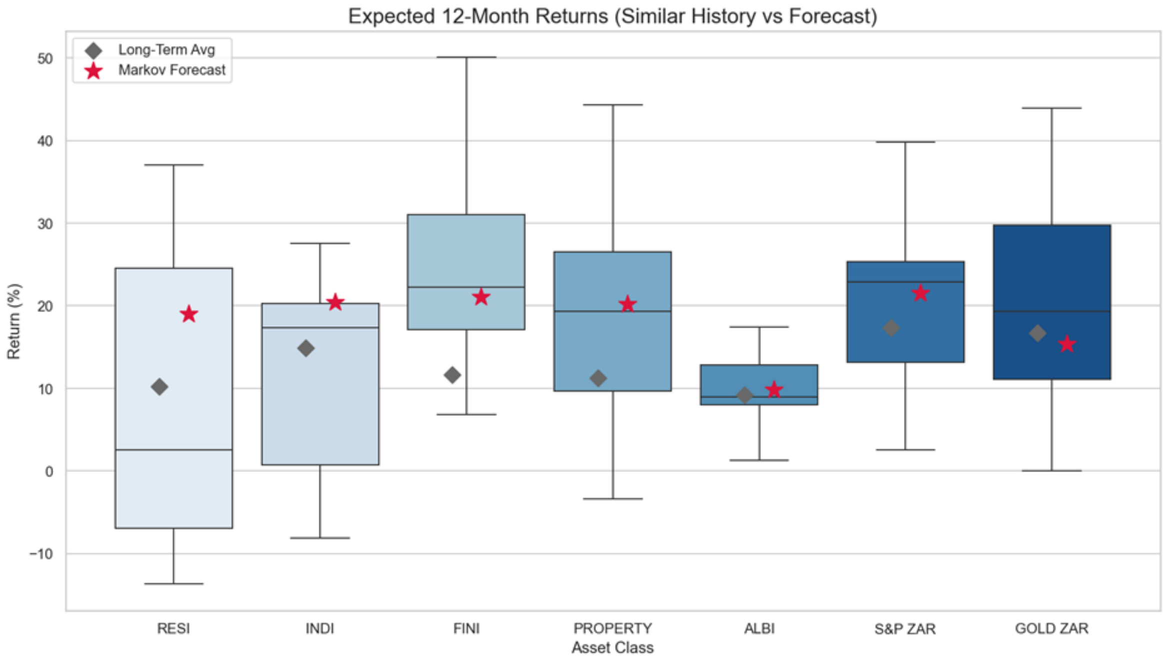


System Note:

This visualisation displays how far current economic variables are stretching from their normal range.

- **Signal:** Platinum (+3.67) and Copper (+3.10) are extreme outliers.
- **Logic:** When variables deviate this far from the mean (0.0), it suggests the environment has shifted, prompting the clustering algorithm to create a specialised "Regime" to handle the anomaly.

C. Forecast Distributions



System Note:

The **Red Star** represents the N.G.U.N.I probability-weighted forecast.

- **Observation:** Note the divergence in **Industrials (INDI)**. The Long-Term Average (Grey Diamond) expects ~10% return, but my pattern recognition engine (Red Star) forecasts significantly higher returns based on the 2021 analogues.

D. Methodology Protocol (v1.0)

N.G.U.N.I. is a hybrid-clustering decision support system.

1. **Ingest:** The system reads 21 macroeconomic variables (Rates, Spreads, Volatility, Commodities).
2. **Cluster:** Using **Subtractive Clustering** and **Stable K-Means**, it classifies the current market into one of 4 historical regimes.
3. **Predict:**
    - *Markov Analysis*: Calculates the momentum probability of staying in the current regime.
    - *Nearest Neighbours*: Identifying historical months with a Euclidean Distance < 4.0 to the current month.
4. **Optimise:** A Constrained Mean-Variance Optimiser solves for the maximum Sharpe Ratio within Regulation 28 limits.