

# Machine Learning in ALM

## Core Capabilities and Applications Across Market, Behavioral, and New Business Domains.

| ML Functional Capabilities / ALM Domains | Prediction                                                                                                                                                               | Dimensionality Reduction                                                                                            | Explanatory                                                                                                                                    |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Market                                   | Forecasting interest rate ranges, bond prices, FX volatility.<br>Feasible but less reliable under high uncertainty.<br>Interest rate ranges, bond prices, FX volatility. | Simplifying interest rate surfaces, FX curves, volatility data to core components.                                  | Understanding drivers like “when interest rates rise, bond prices fall.” Historical relationships like oil-gold or FX-equity patterns.         |
| Behavioral                               | Predicting deposit outflows, loan prepayments, customer churn.<br>Possible in aggregate, not individual.                                                                 | Compressing client data (transactions, channels, credit history) to find relevant behavior clusters.                | Understanding what factors (e.g., interest rates, unemployment) drive customer behaviors like early repayment.                                 |
| New Business                             | Estimating client acquisition under various economic scenarios (e.g. job market trends).<br>Requires high error tolerance.                                               | Grouping customers demographically/geographically for acquisition strategy.<br>Helps marketing and sales targeting. | Studying effects of social media on customer behavior. Identifying key drivers for client inflow/outflow (e.g., fear, trust, economic events). |