Proposal: Predicting FX Transaction Volumes and Next Transaction Date

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1. Introduction

Foreign exchange (FX) transactions are vital in global financial markets. Accurate volume forecasts contribute to liquidity management, risk control, and client engagement. Additionally, predicting the date of a client's next transaction helps identify inactive clients and enables targeted outreach.

1.1 Objectives

- Forecast daily/weekly FX transaction volumes with minimal error.
- Estimate the expected time to a client's next transaction.
- Compare modeling methods (time-series vs. regression, if necessary survival analysis).
- Deliver a deployable prototype for real-world testing based on the database provided.

2. Data Description

Data Sources:

- Historical FX transaction records as volume, ClientID, date of transaction, type of transaction (Sell/ Buy)
- Client profiles (industry, region, fiscal ID which determines some payment obligations).
- Focus in one currency pair and track the FX spot exchange for the same time as the dataset. No intraday movement, just open and closing rates.

Features and Targets:

- Time-series features (lagged volumes, seasonality).
- Client-specific features (client type, risk flags).
- Targets: transaction volume (numeric) and time-to-next-transaction.

3. Methodology

3.1 Data Preprocessing

- Clean missing values.
- Detect outliers and apply capping if necessary.
- Encode categorical variables as transaction type.

3.2 Modeling Approaches

Volume Forecasting:

- Time-series methods (Prophet) or regression models (XGBoost).
- Evaluate with metrics like RMSE.

Next Transaction Date:

- Predict days until next transaction using XGBoost regression.
- Alternative regression which predict days until next transaction.
- Evaluate with metrics like MAE.

3.3 Validation Strategy

- Train-validation-test splits (walk-forward for time-series).
- Randomized Search CV for Machine Learning.

4. Results and Visualization

- Plot predicted vs. actual volumes.

5. Business Impact

- Liquidity Planning: Improved volume forecasts reduce capital buffers.
- Risk Management: Early detection of inactive or high-risk clients.
- Client Engagement: Targeted outreach based on predicted next transaction window.