test

July 7, 2025

```
[1]: import sys
     sys.path.append('../src')
```

```
[3]: from ingestion.data_loader import fetch_stock_data, simulate_cash_inflow
     from processing.data_cleaner import clean_stock_data
     from forecasting.prophet_forecaster import forecast_cash_inflow,␣
      ↪export_forecast_to_csv, plot_forecast_with_aging
     from features.ar_aging import compute_aging_buckets

     # Step 1: Load data
     df = fetch_stock_data('AAPL', '2020-01-01', '2024-12-31')
     df = clean_stock_data(df)
     df = simulate_cash_inflow(df)

     # Step 2: Forecast
     forecast, model = forecast_cash_inflow(df, periods=30)

     # Prepare aging
     aging_df = compute_aging_buckets(df)

     # Step 3: Plot
     plot_forecast_with_aging(forecast, df_actual=df, aging_df=aging_df)

     # Step 4: Export
     export_forecast_to_csv(forecast, "../data/forecast/aapl_forecast_30d.csv")
```

[INFO] Fetching stock data for AAPL from 2020-01-01 to 2024-12-31

/home/oxy/repo/ar-cashflow-
forecasting/notebooks/../src/ingestion/data_loader.py:20: FutureWarning:
YF.download() has changed argument auto_adjust default to True
  df = yf.download(ticker, start=start_date, end=end_date)
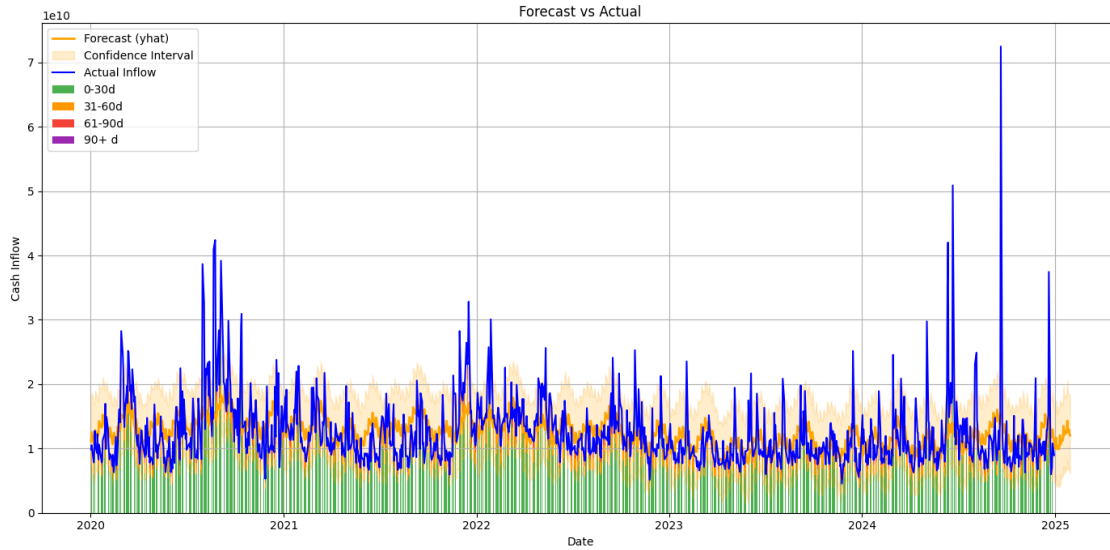[**********************100%***********************] 1 of 1 completed
23:14:27 - cmdstanpy - INFO - Chain [1] start processing

[DEBUG] Flattened columns: ['Date', 'Close', 'High', 'Low', 'Open', 'Volume']
[DEBUG] Incoming columns: ['Date', 'Close', 'Volume']
[DEBUG] Mapped: Date -> date, Close -> close, Volume -> volume

23:14:27 - cmdstanpy - INFO - Chain [1] done processing

Forecast vs Actual

[INFO] Forecast saved to ../data/forecast/aapl_forecast_30d.csv

```python
from evaluation.backtest import backtest_prophet
from forecasting.prophet_forecaster import plot_forecast_with_aging

metrics, forecast, model = backtest_prophet(df, forecast_days=30)
print("Evaluation Metrics:")
print(metrics)

plot_forecast_with_aging(forecast, df_actual=df, aging_df=aging_df)
```

```
23:15:10 - cmdstanpy - INFO - Chain [1] start processing
23:15:10 - cmdstanpy - INFO - Chain [1] done processing

Evaluation Metrics:
{'MAPE': 23.24, 'RMSE': np.float64(3561424389.67)}
```

```
---------------------------------------------------------------------------
KeyError                                  Traceback (most recent call last)
File ~/repo/ar-cashflow-forecasting/oxy/lib/python3.13/site-packages/pandas/core/
 ↪indexes/base.py:3812, in Index.get_loc(self, key)
   3811 try:
-> 3812     return self._engine.get_loc(casted_key)
   3813 except KeyError as err:

File pandas/_libs/index.pyx:167, in pandas._libs.index.IndexEngine.get_loc()

File pandas/_libs/index.pyx:196, in pandas._libs.index.IndexEngine.get_loc()
```

```
File pandas/_libs/hashtable_class_helper.pxi:7088, in pandas._libs.hashtable.
  ↪PyObjectHashTable.get_item()

File pandas/_libs/hashtable_class_helper.pxi:7096, in pandas._libs.hashtable.
  ↪PyObjectHashTable.get_item()

KeyError: 'bucket_0_30'

The above exception was the direct cause of the following exception:

KeyError                                  Traceback (most recent call last)
Cell In[4], line 8
      5 print("Evaluation Metrics:")
      6 print(metrics)
----> 8 plot_forecast_with_aging(model, forecast, df)

File ~/repo/ar-cashflow-forecasting/notebooks/../src/forecasting/
  ↪prophet_forecaster.py:58, in plot_forecast_with_aging(forecast, df_actual,␣
  ↪aging_df, title)
     55 plt.figure(figsize=(14, 7))
     57 # Plot actual inflows as bars
---> 58 plt.bar(aging_df['Date'], aging_df[              ], label='0-30d', color␣
  ↪'#4caf50')
     59 plt.bar(aging_df['Date'], aging_df['bucket_31_60'],␣
  ↪bottom=aging_df['bucket_0_30'], label='31-60d', color='#ff9800')
     60 plt.bar(aging_df['Date'], aging_df['bucket_61_90'],␣
  ↪bottom=aging_df['bucket_0_30'] + aging_df['bucket_31_60'], label='61-90d',␣
  ↪color='#f44336')

File ~/repo/ar-cashflow-forecasting/oxy/lib/python3.13/site-packages/pandas/core/
  ↪frame.py:4107, in DataFrame.__getitem__(self, key)
   4105 if self.columns.nlevels > 1:
   4106     return self._getitem_multilevel(key)
-> 4107 indexer = self.columns.get_loc(key)
   4108 if is_integer(indexer):
   4109     indexer = [indexer]

File ~/repo/ar-cashflow-forecasting/oxy/lib/python3.13/site-packages/pandas/core/
  ↪indexes/base.py:3819, in Index.get_loc(self, key)
   3814     if isinstance(casted_key, slice) or (
   3815         isinstance(casted_key, abc.Iterable)
   3816         and any(isinstance(x, slice) for x in casted_key)
   3817     ):
   3818         raise InvalidIndexError(key)
-> 3819     raise KeyError(key) from err
   3820 except TypeError:
   3821     # If we have a listlike key, _check_indexing_error will raise
   3822     #  InvalidIndexError. Otherwise we fall through and re-raise
```

```
   3823        #  the TypeError.
   3824        self._check_indexing_error(key)

KeyError: 'bucket_0_30'
```

<Figure size 1400x700 with 0 Axes>

[ ]: