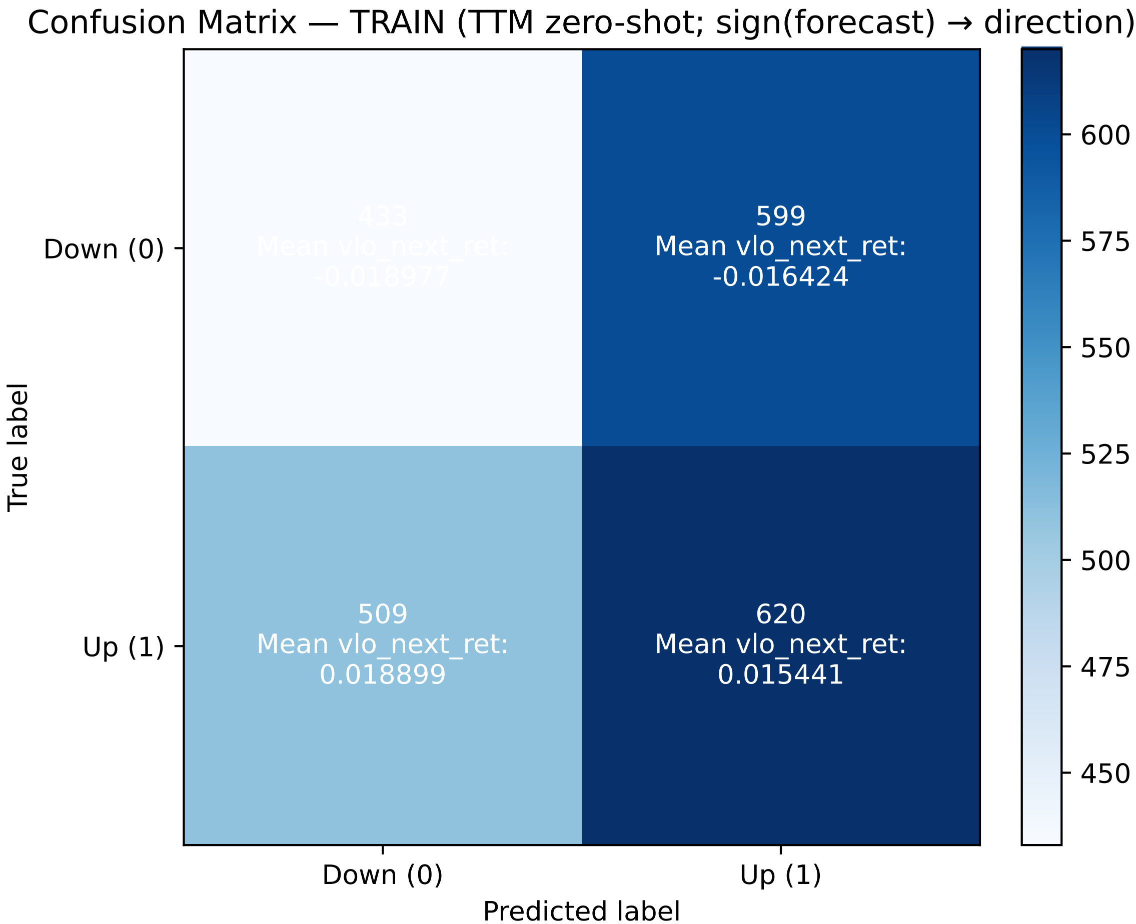
# e TinyTimeMixer (TTM) — Zero-Shot Forecast → Directio

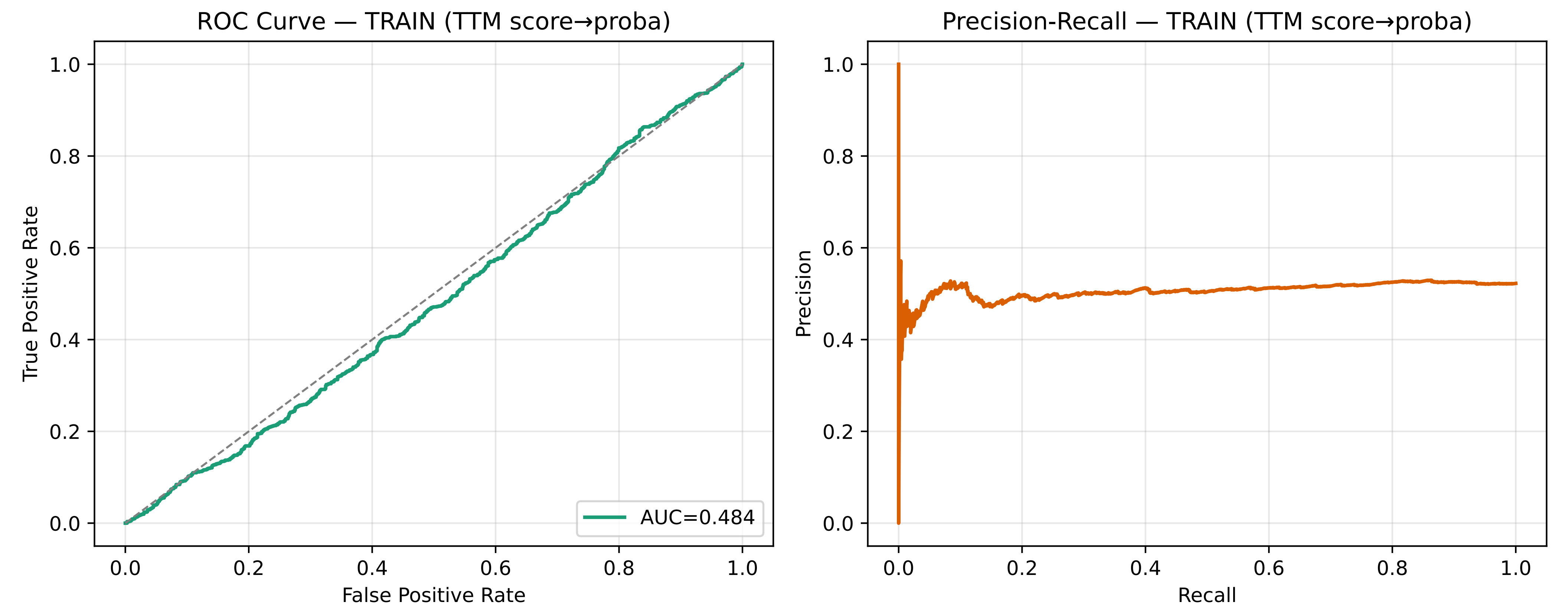
Generated: 2026-02-26 17:04:09
TRAIN period: ≤ 2022-12-31 | TEST period: ≥ 2023-01-01
TRAIN size: 2,161 | TEST size: 787
Context length: 512 | Forecast length: 96 | prediction_filter_length: 1
TTM model: ibm-granite/granite-timeseries-ttm-r2 (revision=main)
Observable (exogenous) feature count: 76
Direction rule: Up=1 if forecast(ret_VLO, t+1) > 0 else 0
Diagnostics: TimeSeriesSplit CV (ROC-AUC primary) on TRAIN; full metrics on TEST

# Cross-Validation Diagnostics — Training Set (≤ 2022-12-31)

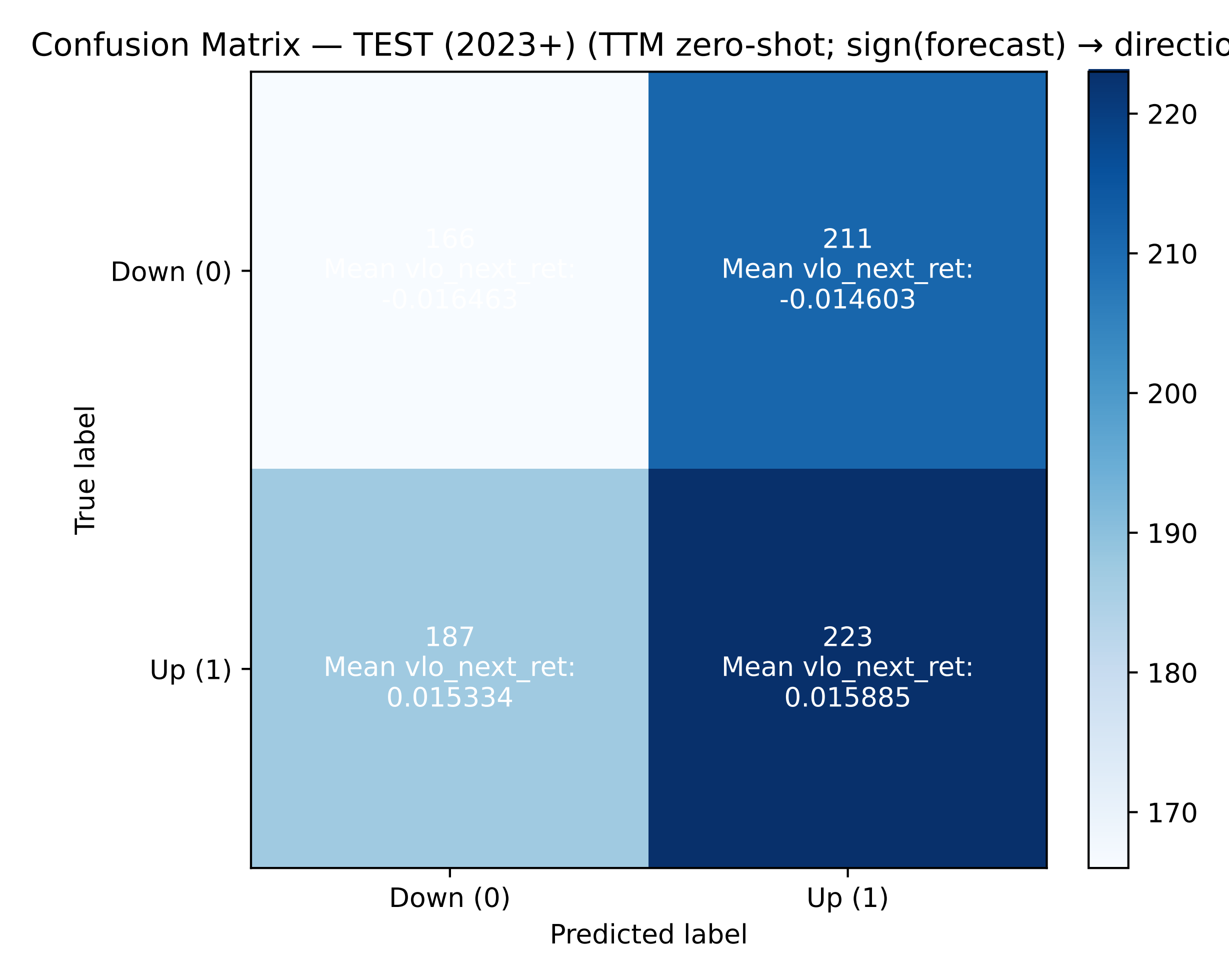
| metric | value |
| --- | --- |
| mean ROC-AUC (CV folds)  [primary] | 0.4764 |
| std  ROC-AUC (CV folds) | 0.0278 |
| mean balanced_accuracy (CV folds) | 0.4762 |
| std  balanced_accuracy (CV folds) | 0.0232 |



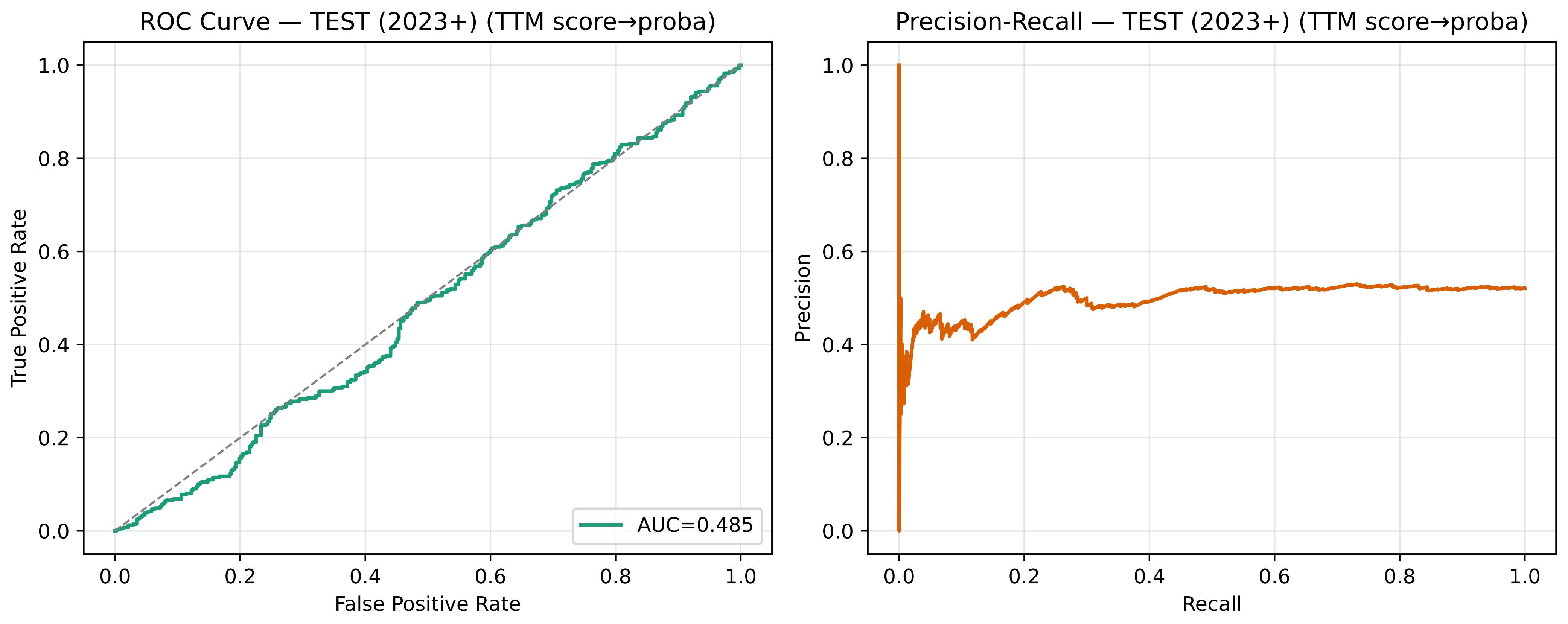
Confusion Matrix — TRAIN (TTM zero-shot; sign(forecast) → direction)
433
Mean vlo_next_ret:
-0.018977
599
Mean vlo_next_ret:
-0.016424
509
Mean vlo_next_ret:
0.018899
620
Mean vlo_next_ret:
0.015441
Down (0)
Up (1)
True label
Down (0)
Up (1)
Predicted label
600
575
550
525
500
475
450



ROC Curve — TRAIN (TTM score→proba)
True Positive Rate
False Positive Rate
AUC=0.484
0.0
0.2
0.4
0.6
0.8
1.0
Precision-Recall — TRAIN (TTM score→proba)
Precision
Recall

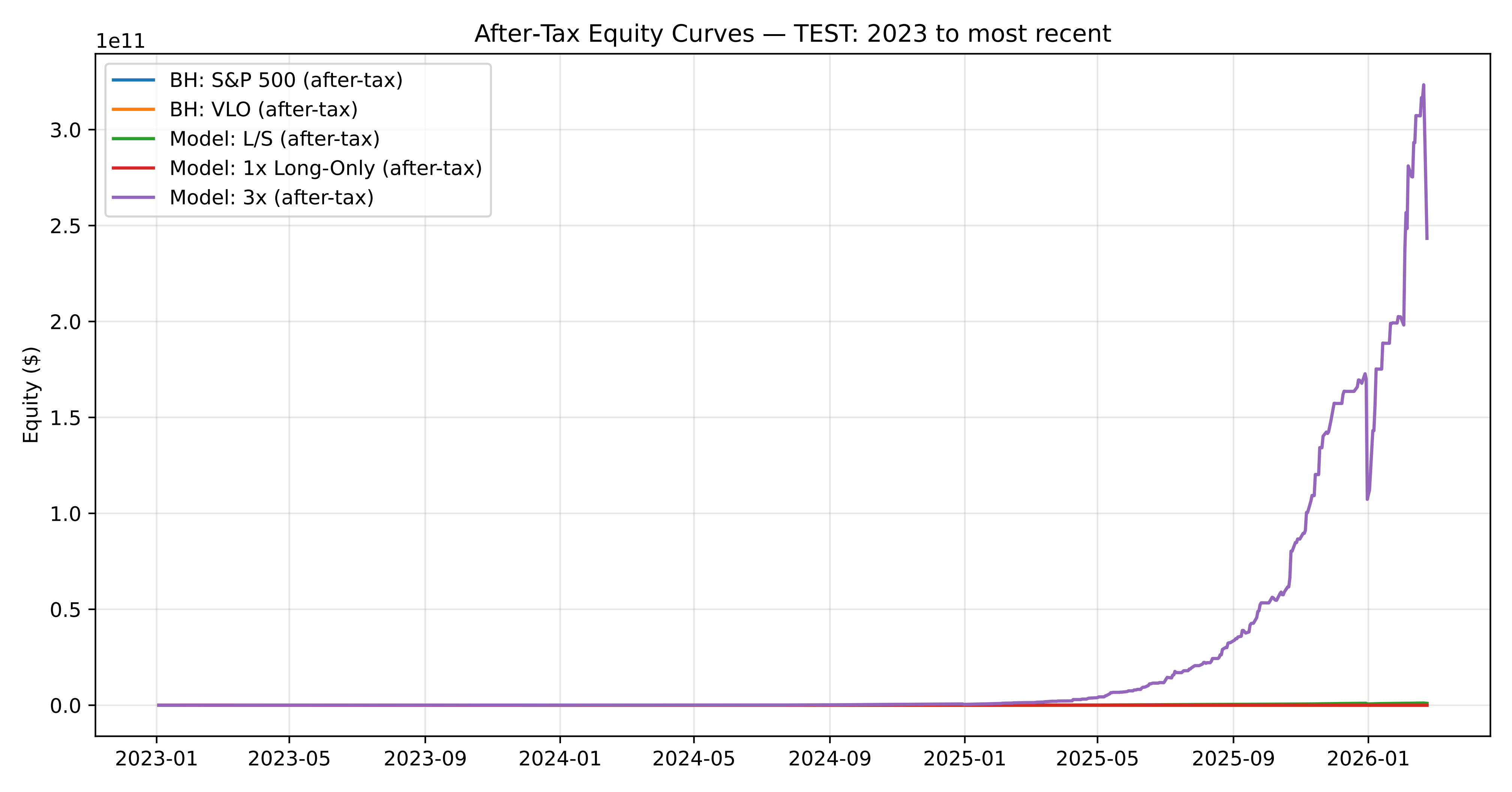


Confusion Matrix — TEST (2023+) (TTM zero-shot; sign(forecast) → directio
166
Mean vlo_next_ret:
-0.016463
211
Mean vlo_next_ret:
-0.014603
187
Mean vlo_next_ret:
0.015334
223
Mean vlo_next_ret:
0.015885
Down (0)
Up (1)
True label
Down (0)
Up (1)
Predicted label
220
210
200
190
180
170


ROC Curve — TEST (2023+) (TTM score→proba)
True Positive Rate
False Positive Rate
AUC=0.485
0.0
0.2
0.4
0.6
0.8
1.0
Precision-Recall — TEST (2023+) (TTM score→proba)
Precision
Recall

## Classification Report — TEST (2023+)

| | precision | recall | f1-score | support |
|---|---|---|---|---|
| 0 | 0.470 | 0.440 | 0.455 | 377 |
| 1 | 0.514 | 0.544 | 0.528 | 410 |
| accuracy | | | 0.494 | 787 |
| macro avg | 0.492 | 0.492 | 0.492 | 787 |
| weighted avg | 0.493 | 0.494 | 0.493 | 787 |



After-Tax Equity Curves — TEST: 2023 to most recent
1e11
BH: S&P 500 (after-tax)
BH: VLO (after-tax)
Model: L/S (after-tax)
Model: 1x Long-Only (after-tax)
Model: 3x (after-tax)
Equity ($)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2023-01
2023-05
2023-09
2024-01
2024-05
2024-09
2025-01
2025-05
2025-09
2026-01

# Annual After-Tax Performance (2023+), incl. Average

| | BH: S&P 500 (after-tax) | BH: VLO (after-tax) | Model: L/S (after-tax) | Model: 1x Long-Only (after- | Model: 3x (after-tax) |
|---|---|---|---|---|---|
| 2023 | 19.87% | 10.64% | 1,722.36% | 300.76% | 9,570.79% |
| 2024 | 19.32% | -3.45% | 1,176.48% | 217.48% | 4,525.66% |
| 2025 | 13.36% | 29.60% | 2,571.53% | 429.97% | 23,248.29% |
| 2026 | -0.32% | 15.78% | 46.57% | 27.96% | 116.94% |
| Average | 13.06% | 13.14% | 1,379.23% | 244.04% | 9,365.42% |

Sharpe Ratios (Annualized, Daily Returns) — TEST (2023+ only)

| | Sharpe |
|---|---|
| BH: S&P 500 | 1.311 |
| BH: VLO | 0.682 |
| Model: L/S | 13.736 |
| Model: 1x Long-Only | 8.705 |
| Model: 3x | 8.608 |

## Run Metadata & Time-Split Summary

```
Report saved: /mnt/batch/tasks/shared/LS_root/mounts/clusters/dvandyk1/code/Users/dva
Preprocessor saved: /mnt/batch/tasks/shared/LS_root/mounts/clusters/dvandyk1/code/Use
Model snapshot saved: /mnt/batch/tasks/shared/LS_root/mounts/clusters/dvandyk1/code/U

TRAIN period: ≤ 2022-12-31 | TEST period: ≥ 2023-01-01
TRAIN aligned preds: 2,161 | TEST aligned preds: 787
CV folds: 5

TTM model: ibm-granite/granite-timeseries-ttm-r2 (revision=main)
Context length: 512 | Forecast length: 96 | prediction_filter_length: 1
Target forecasted: ret_VLO (1-step ahead used for direction)
Observable columns used: 76

CV ROC-AUC (TRAIN, primary): mean=0.4764, std=0.0278
CV Balanced Acc (TRAIN, secondary): mean=0.4762, std=0.0232

TEST ROC-AUC (score→proba): 0.4853
TEST Balanced Accuracy: 0.4921 | TEST Accuracy: 0.4943

Backtest assumptions (TEST period only, AFTER-TAX curves shown):
  Initial capital: $100,000
  Tx cost per side: 2.00 bps
  Taxes (annual on positive P&L, loss carry-forward):
    - Long-term (buy & hold): 20.0%
    - Short-term (active): 37.0%
  Short borrow APR (L/S shorts): 0.30%
  Leverage costs:
    - Financing APR on borrowed notional: 6.00%
    - Expense APR on gross exposure:      1.00%
  Stop-loss: NOT APPLIED

Sharpe ratios (annualized, daily returns; net of costs):
  BH: S&P 500:         1.311
  BH: VLO:             0.682
  Model: L/S:          13.736
  Model: 1x Long-Only: 8.705
  Model: 3x:           8.608

Feature exclusions (pre-model): vlo_next_ret, vlo_next_dir
Direction rule: Up=1 if forecast(ret_VLO, t+1) > 0 else 0
```