Trees (RandomizedSearchCV, Refit by ROC-AUC) — VLO

Generated: 2026-02-25 21:49:45
TRAIN period: ≤ 2022-12-31 | TEST period: ≥ 2023-01-01
TRAIN size: 2,672 | TEST size: 787
Features — scaled (float + VOL_*): 72 | passthrough: 5
RandomizedSearchCV: n_iter=80, refit='roc_auc'
35, 'clf__n_estimators': 800, 'clf__min_samples_split': 5, 'clf__min_samples_leaf': 5, 'clf__max_features': 'log2', 'c
Best CV ROC-AUC: 0.5363
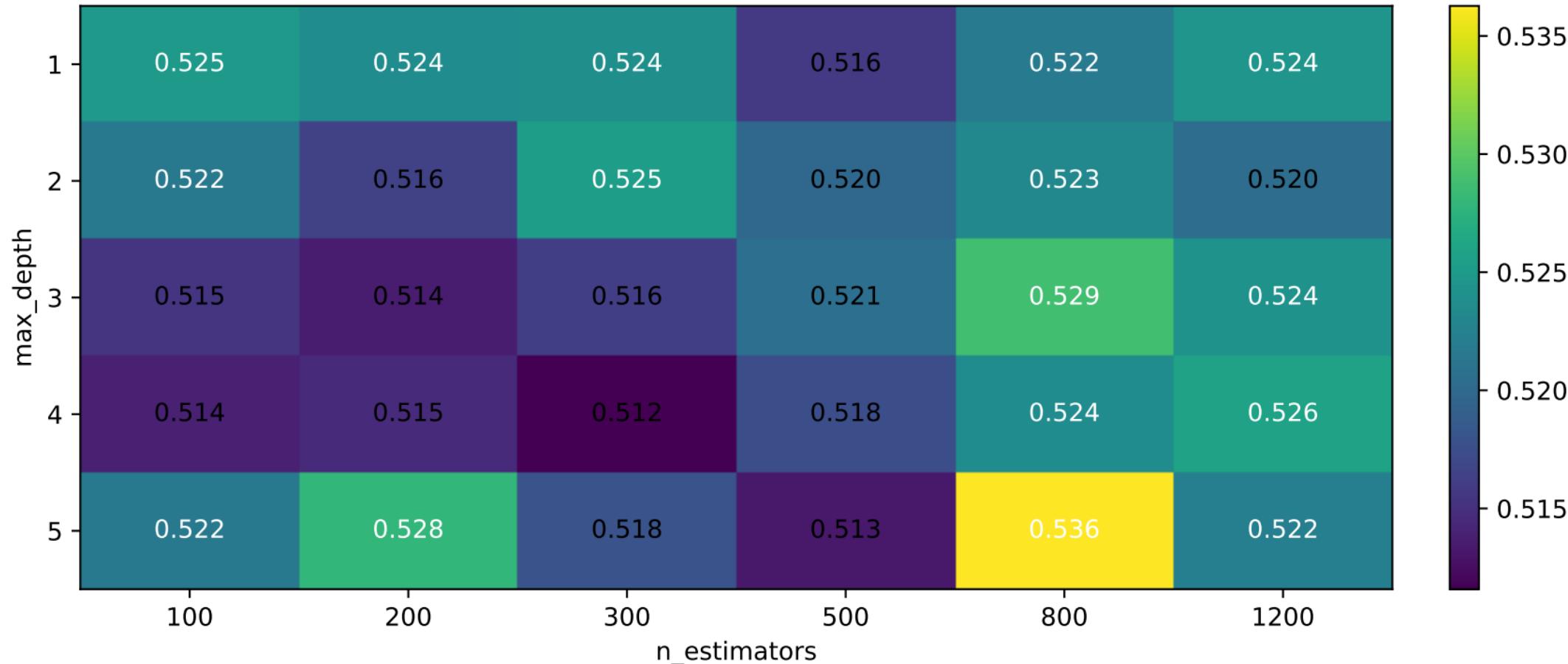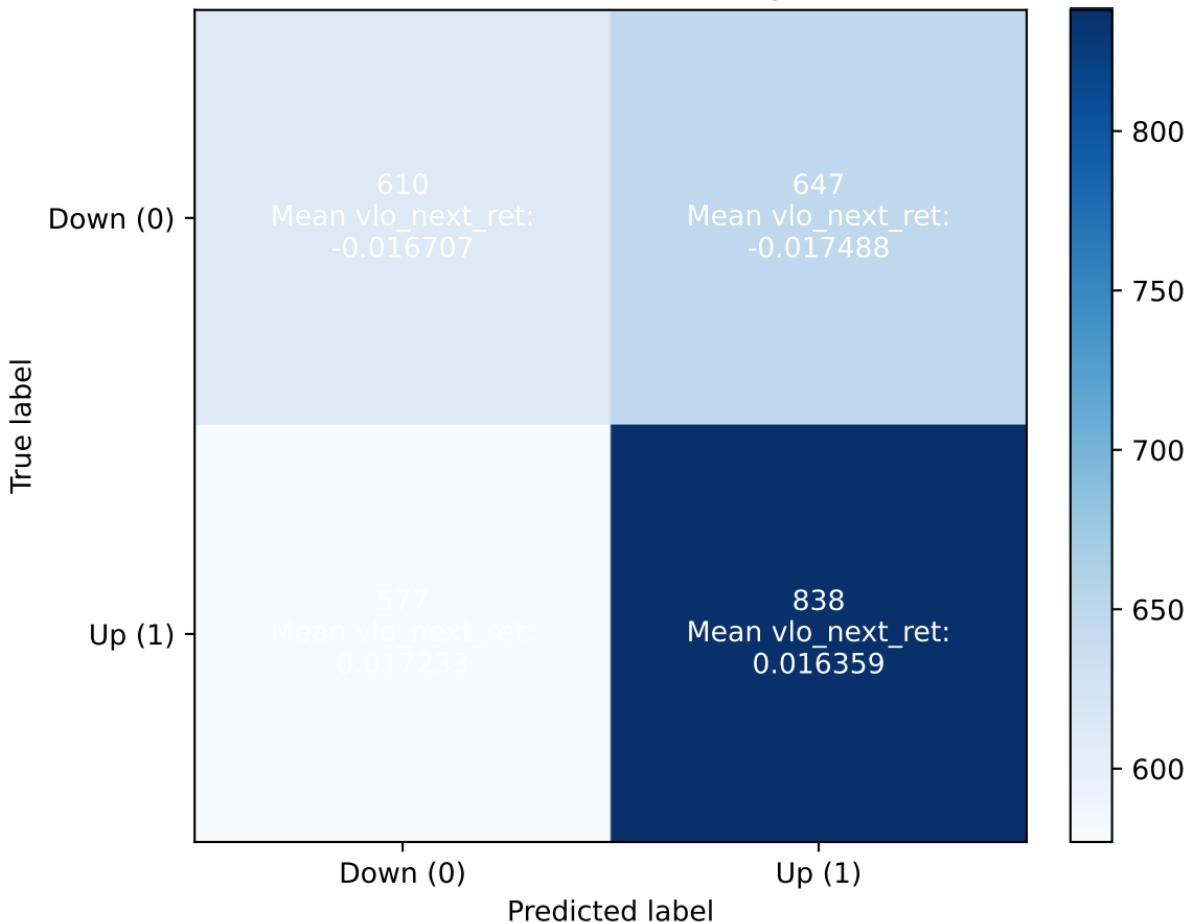
Randomized Search — max mean ROC-AUC over other GBT params
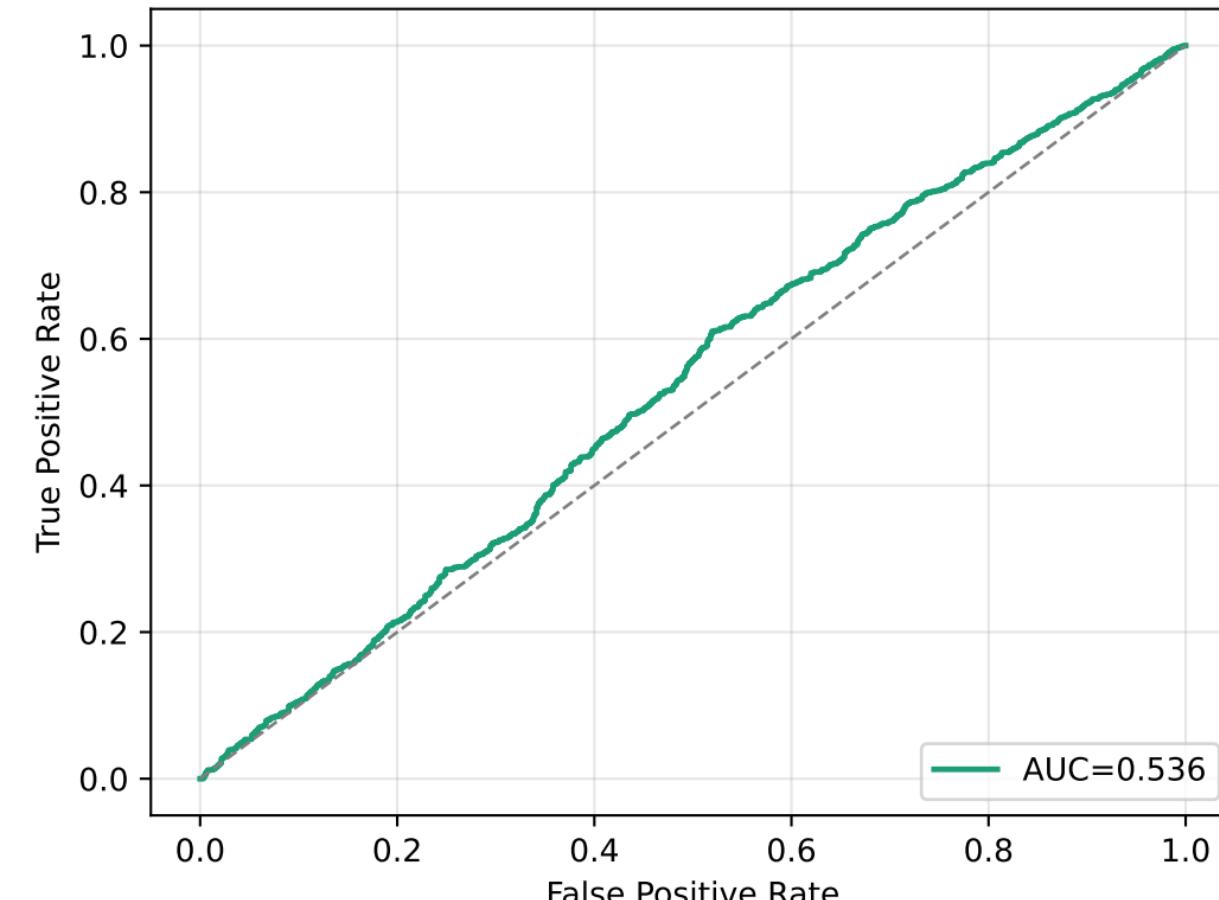
Cross-Validation ROC-AUC — Training Set (≤ 2022-12-31)

metric	value
mean ROC-AUC (CV folds)	0.5363
std ROC-AUC (CV folds)	0.0117
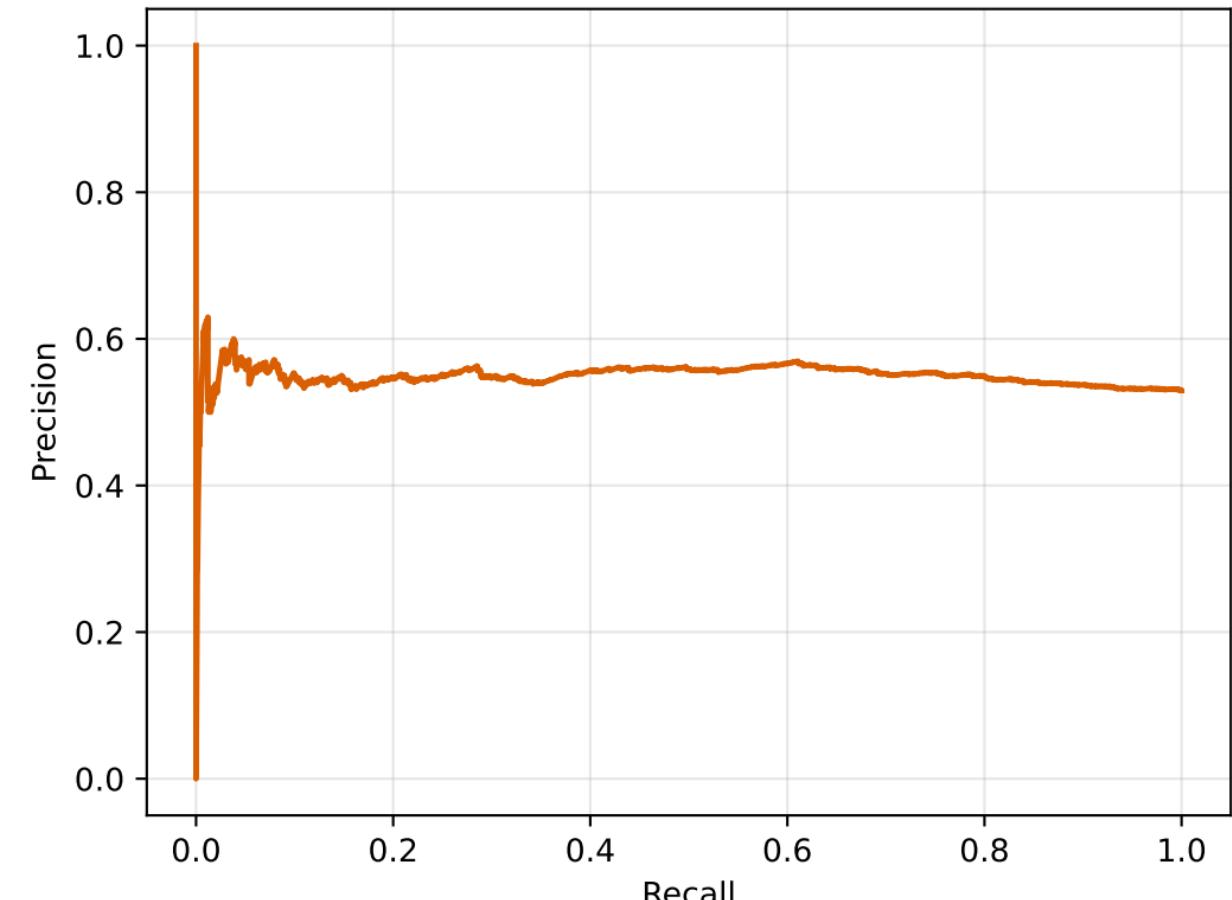
Confusion Matrix — TRAIN (CV predictions)

	Predicted Down (0)	Predicted Up (1)
True Down (0)	610 Mean vlo_next_ret: -0.016707	647 Mean vlo_next_ret: -0.017488
True Up (1)	577 Mean vlo_next_ret: 0.017233	838 Mean vlo_next_ret: 0.016359
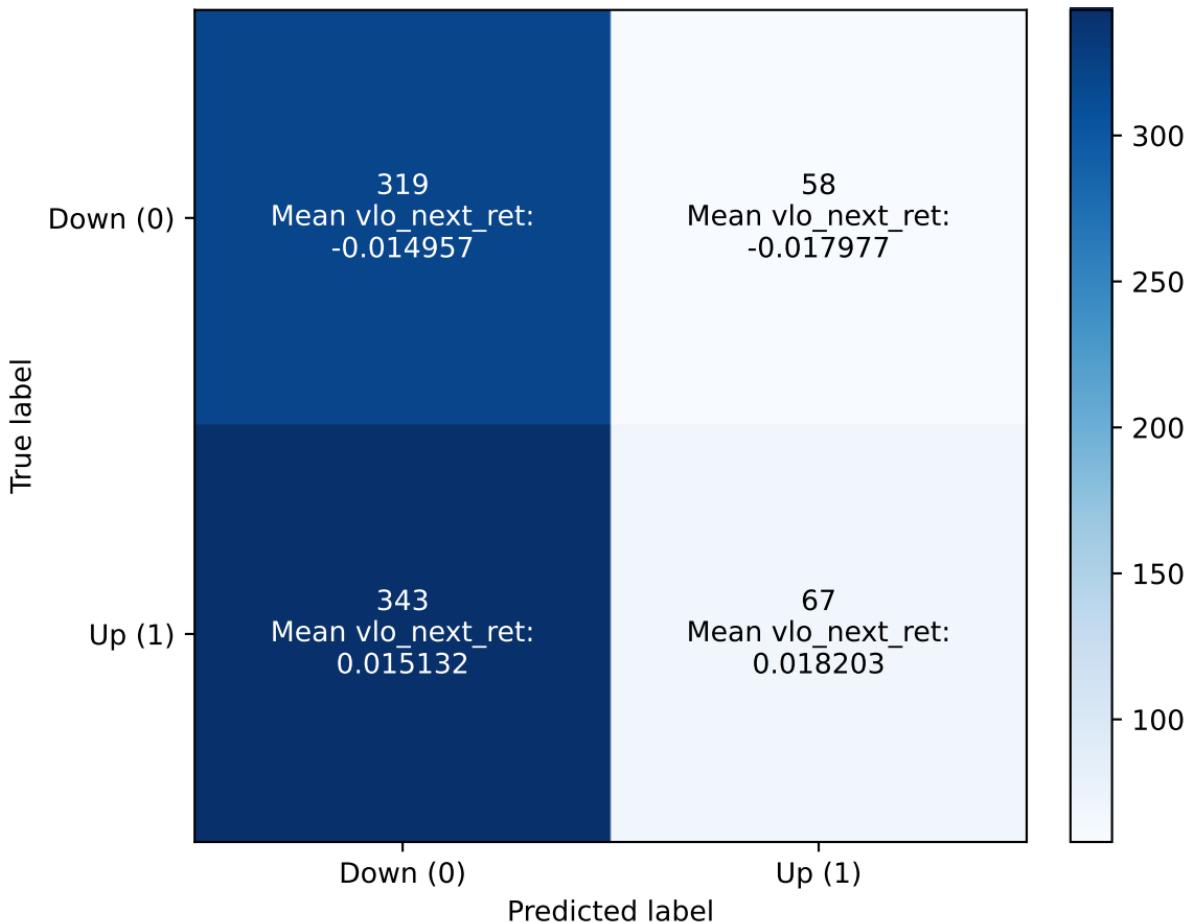
ROC Curve — TRAIN (CV pooled)
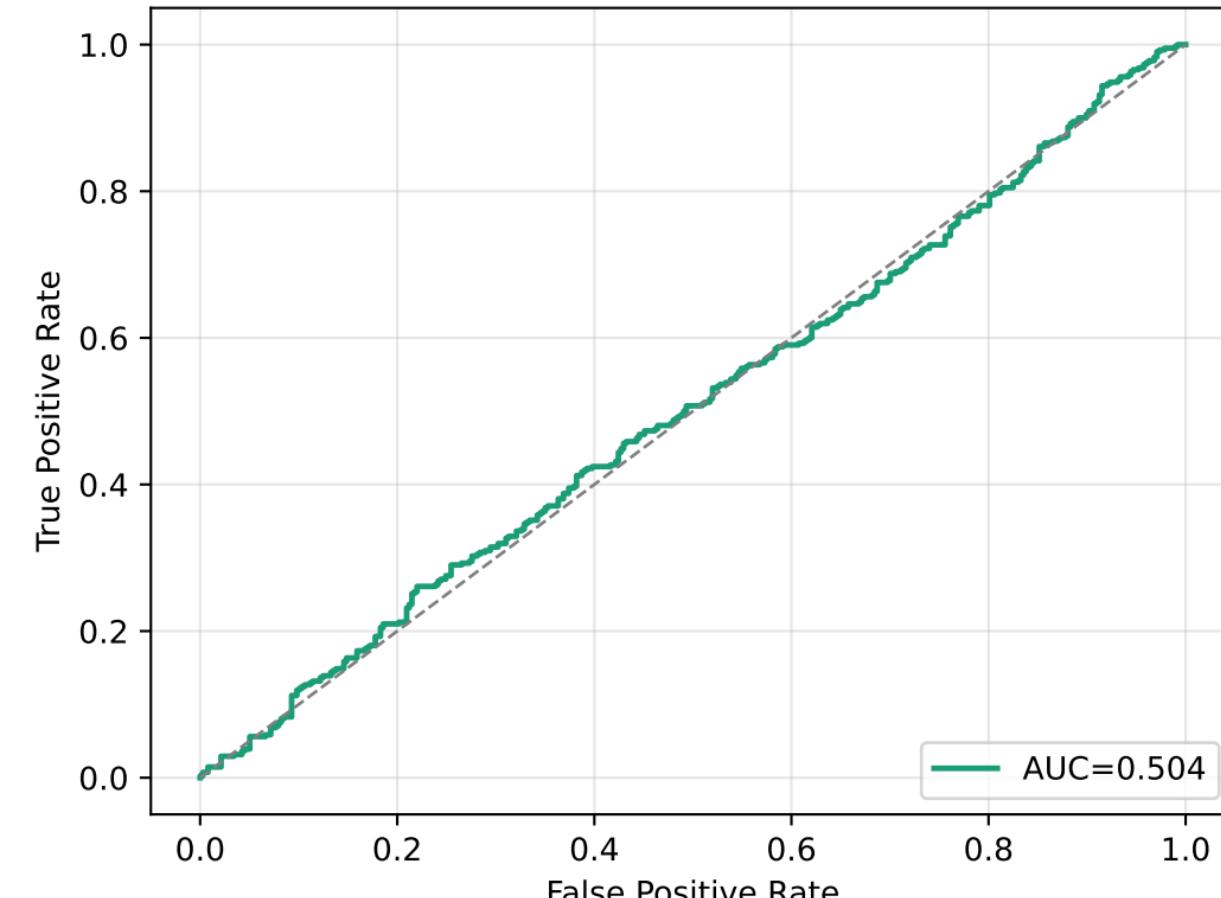
Precision-Recall — TRAIN (CV pooled)

AUC=0.536
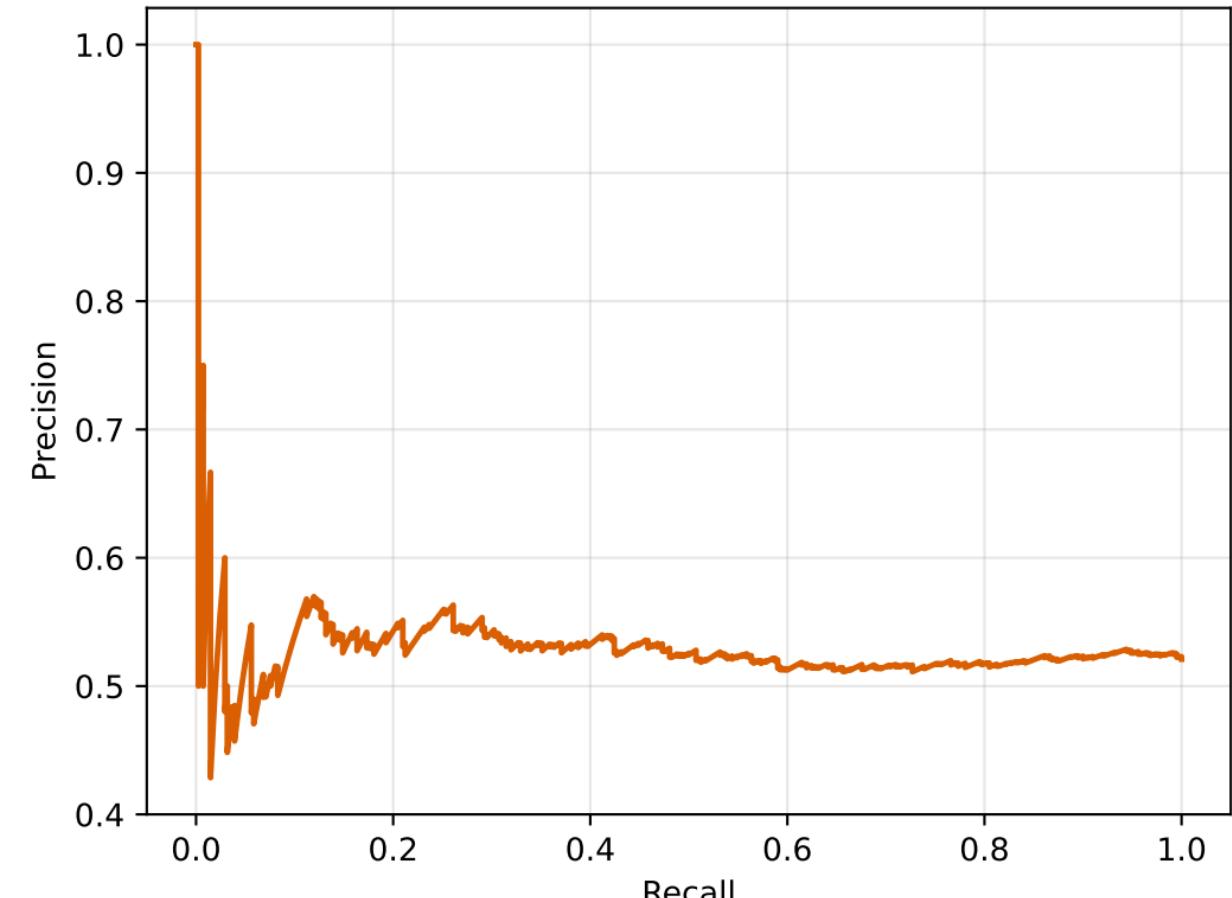
Confusion Matrix — TEST (2023+)

	Predicted label: Down (0)	Predicted label: Up (1)
True label: Down (0)	319 Mean vlo_next_ret: -0.014957	58 Mean vlo_next_ret: -0.017977
True label: Up (1)	343 Mean vlo_next_ret: 0.015132	67 Mean vlo_next_ret: 0.018203

ROC Curve — TEST (2023+)

AUC=0.504
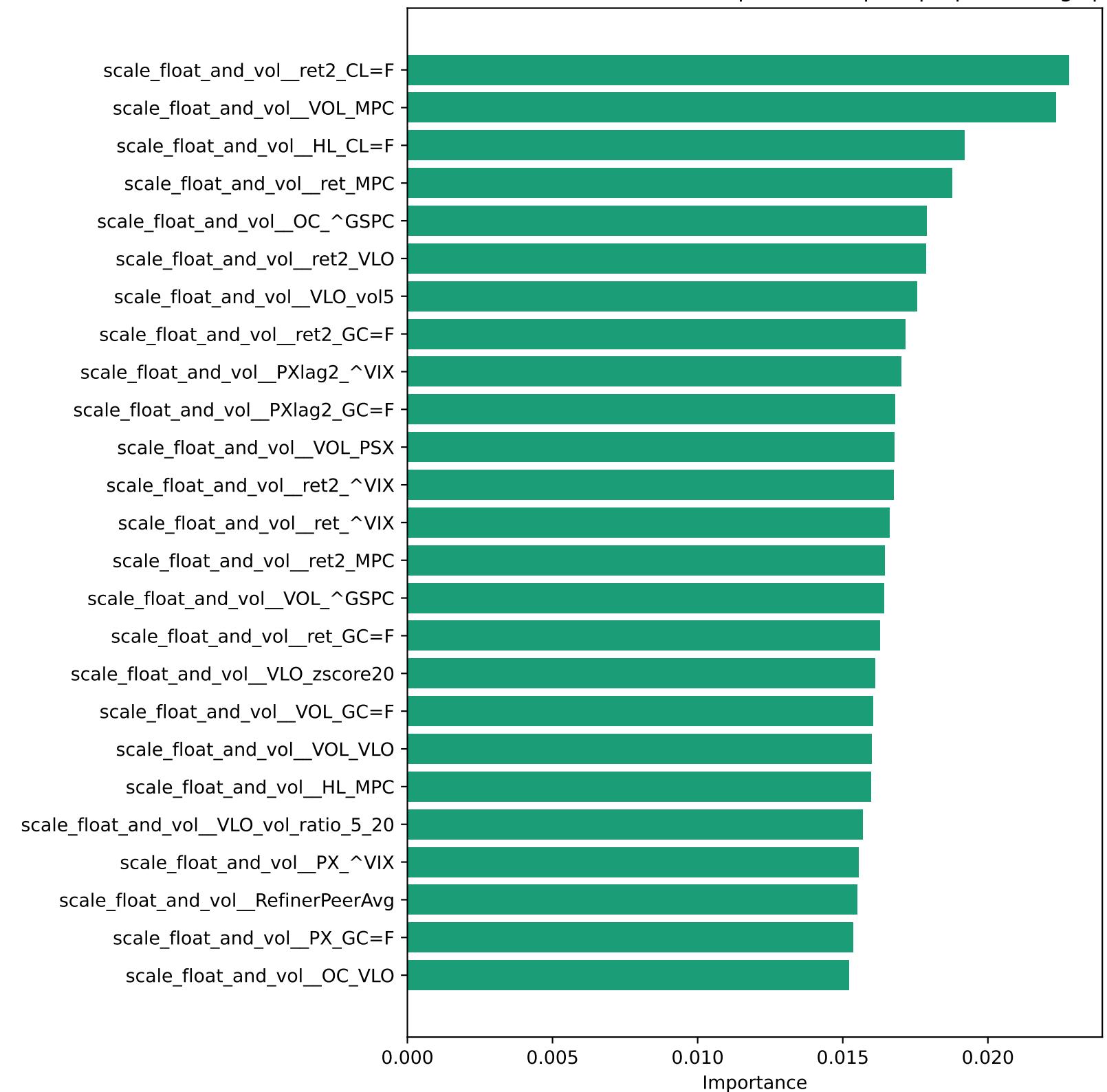
Precision-Recall — TEST (2023+)
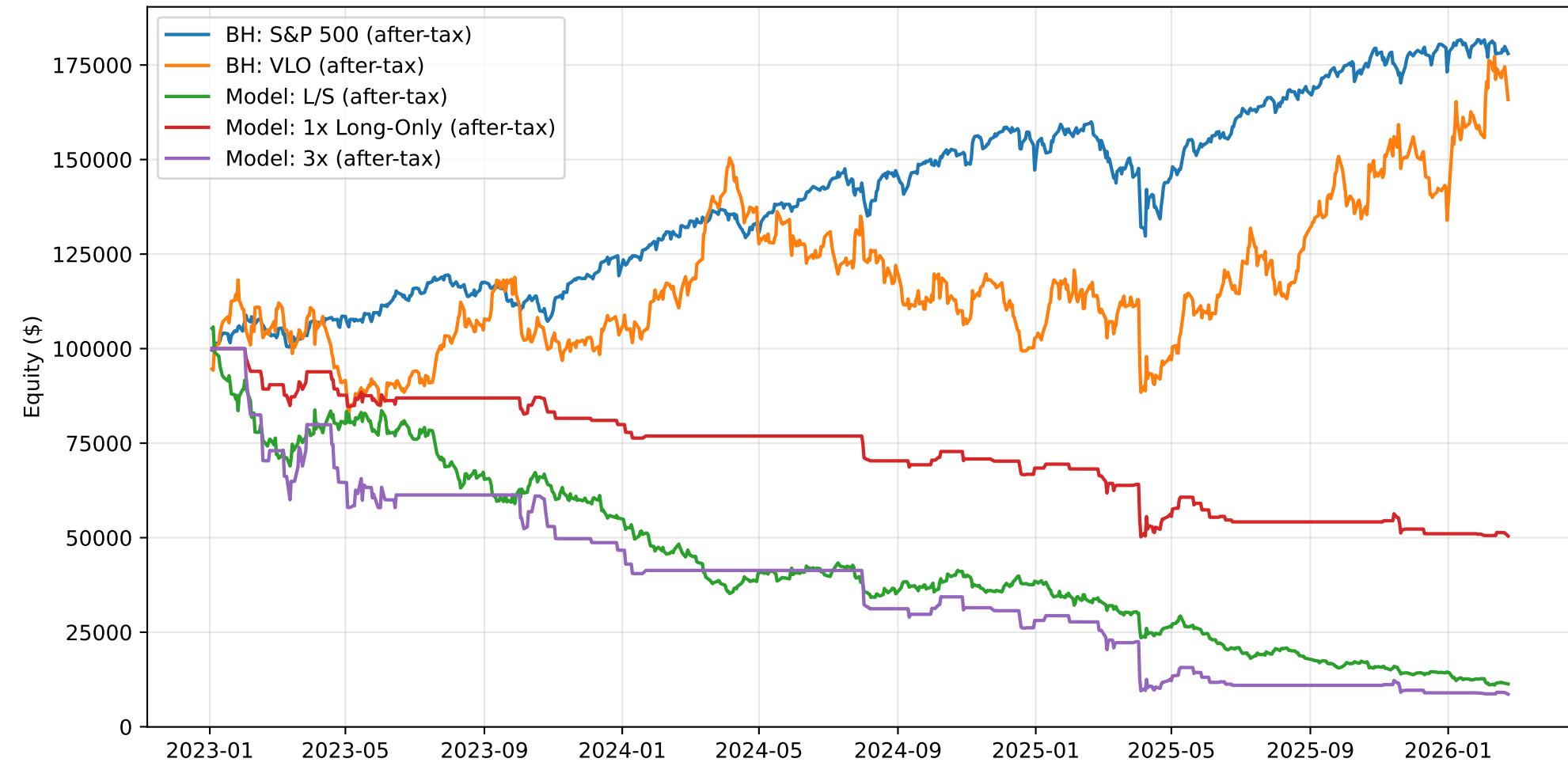
Classification Report — TEST (2023+)

	precision	recall	f1-score	support
0	0.482	0.846	0.614	377
1	0.536	0.163	0.250	410
accuracy			0.490	787
macro avg	0.509	0.505	0.432	787
weighted avg	0.510	0.490	0.425	787

Gradient Boosted Trees Feature Importances (post-preprocessing space)

After-Tax Equity Curves — TEST: 2023 to most recent

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-tax)	Model: 3x (after-tax)
2023	19.78%	9.50%	-47.65%	-20.08%	-53.31%
2024	19.21%	-3.45%	-29.83%	-14.39%	-39.79%
2025	13.32%	29.79%	-62.15%	-25.37%	-68.08%
2026	-0.32%	16.09%	-20.77%	-1.21%	-4.04%
Average	13.00%	12.98%	-40.10%	-15.26%	-41.30%

Run Metadata & Time-Split Summary

Report saved: /mnt/batch/tasks/shared/LS_root/mounts/clusters/dvandyk1/code/Users/dva
Scaler saved: /mnt/batch/tasks/shared/LS_root/mounts/clusters/dvandyk1/code/Users/dva
Model saved: /mnt/batch/tasks/shared/LS_root/mounts/clusters/dvandyk1/code/Users/dva

TRAIN period: ≤ 2022-12-31 | TEST period: ≥ 2023-01-01
TRAIN size: 2,672 | TEST size: 787
CV folds: 5
RandomizedSearchCV n_iter: 80
Scaled features (float + VOL_*): 72
Passthrough numeric features: 5
Best params: {'clf__subsample': 0.85, 'clf__n_estimators': 800, 'clf__min_samples_spl
Best CV ROC-AUC (refit metric): 0.5363
TEST ROC-AUC: 0.5044 | TEST Accuracy: 0.4905

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%
  3x long-only daily cost (financing+expense): 0.0595%
  Stop-loss: NOT APPLIED

Feature exclusions (pre-model): vlo_next_ret, vlo_next_dir