VecViz Expected Up Body & Expected Down Body (EUB & EDB) Performance Report

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1 April 2025

Table of contents

Introduction

The area of a security's forward return distribution between the 95th and 100th th percentile upward and downward are often referred to as the distribution's "tails". In this report we are going to discuss metrics for the expected value upward and downward for the area inside the tails, i.e., the distribution body.

We refer to these metrics as Expected Up Body and Expected Down Body, or EUB and EDB, respectively. More specifically, EUB is the horizon end date forecast probability-weighted average price between the model date price and the 95th probability percentile price upward. EDB is defined similarly, but pertains to the area between the Model Date price and the 95th probability percentile price downward. We believe that EUB and EDB can be useful to investors as estimates of base case / moderate upside and downside.

The aim of this report is to inform a broad spectrum of readers of the behavior and accuracy of VecViz's EUB and EDB estimates, and how they might influence portfolio performance. To do so, we rely upon both comparison to the well-known and still widely used "Sigma" approach to volatility.

Please see the "Important Considerations" section of this report for important disclosures related to the methods used in this report and other topics as well.

Evaluation of EUB and EDB Estimates

We compare Expected Body metrics derived from VecViz's Vector Model ('V') to VecViz's implementation to comparable statistics for Sigma (S), the standard deviation of the "normal" or "Gaussian" distribution.

Mean absolute average error (MAE)

Mean absolute average error (MAE) is the metric we use when evaluating accuracy. For example, when evaluating EUB, we take the average absolute value of the difference between the actual forward horizon price and the model date EUB price for the given model, for ticker model dates that are in the given model's "evaluation set".

Each model's EUB evaluation set includes all the ticker model dates for which the forward horizon price is between the model date price and that model's estimate of the 95th percentile upward price (95U). Likewise for each model's EDB evaluation set, substituting 95D for 95U. Given that there are differences between the 95th percentile as calculated by the Vector Model and Sigma, the evaluation sets for EUB and EDB estimates can be quite different. The differences in ticker level evaluation set constituents can often be apparent when reviewing the Top/Bottom 30 ticker lists for the Vector Model and Sigma included in this report.

As discussed further below, we evaluate MAE relative to Sigma both on an outright and adjusted basis, to address, at least in part, some of the aforementioned differences in the evaluation sets. We also evaluate MAE on the basis of its variability by date (when averaged across tickers) and by ticker (when averaged across dates), as a consistent, moderate level of error is preferable to potential large spikes in error.

Return on Expected Up Body and Return on Expected Down Body (ROEDB and ROEUB)

To determine the influence of Vector Model EUB and EDB on risk tolerant/ return seeking and risk avoidant strategies relative to Sigma EUB and EDB we calculate ROEUB and ROEDB (Return on EUB and Return on EDB, respectively). Specifically, Sigma ROEUB and Sigma ROEDB are ascribed the underlying ticker return, and Vector Model ROEUB (ROEDB) is ascribed a multiple of the underlying return based on the ratio of Vector Model EUB (Sigma EDB) to Sigma EUB (Vector Model EDB), subject to a cap and floor of 3.00x and 0.333x.

So, for example, if Sigma said EUB for ticker ABC was 2.00% and the Vector Model said EUB for ABC was 4.00%, the Vector Model ROEUB would be double Sigma's. Likewise, if the Vector Model said EUB for ABC was 1.00%, the Vector Model ROEUB would be half of Sigma's.

For the Vector Model ROEUB to be higher than Sigma's it signifies that either (1) Vector Model EUB exceeded Sigma's EUB (to the upside) and the ticker traded higher, or (2) Sigma EUB exceeded the Vector Model's EUB (to the upside) and the ticker traded lower.

However, if Sigma said EDB for XYZ was -2.00% and the Vector Model said EDB for XYZ was -4.00% the Vector Model's ROEDB for XYZ would be half Sigma's. Likewise, if Vector Model EDB for XYZ was -1.00% its ROEDB would be double Sigma's.

For the Vector Model ROEDB to be higher than Sigma's it signifies that either (1) Vector Model EDB exceeded Sigma's EDB (to the downside) and the ticker traded lower, or (2) Sigma EDB exceeded the Vector Model's EDB (to the downside) and the ticker traded higher.

Cost of borrowing or crediting for uninvested funds is incorporated into neither ROEUB or ROEDB.

Addressing The Influence of 95th percentile differences on MAE and ROEB

All else equal, the model with greater distance from the model date price to 95U (95D) will have higher EUB (EDB) distance and also a higher EUB (EDB) MAE. If prices drift upward over time, it will also have a higher ROEUB (lower ROEDB). Thus, MAE for EUB and EDB and ROEUB and ROEDB must be considered in the context of the distance to 95U and 95D, respectively, in order to discern what additional information value they offer.

Thus, when evaluating MAE, in addition to outright comparison of Vector Model MAE to Sigma we also have a 95th percentile distance adjusted comparison. Specifically, for this adjusted comparison we multiply Sigma's MAE by the ratio of the distance to the 95th percentile for the Vector Model relative to Sigma's distance to its 95th percentile. If Sigma's 95th percentile is more distant that the Vector Model's it's adjusted MAE will be smaller than its unadjusted MAE, and vice versa.

Likewise, when evaluating ROEUB and ROEDB, in additionto outright comparison to Sigma ROEDB and ROEUB (which in both cases are simply the underlying ticker returns), we also have an adjusted comparison. Specifically, we multiply Sigma's ROEUB (ROEDB) by the ratio of aggregate average Vector Model EUB (Sigma EDB) to aggregate average Sigma EUB (Vector Model EDB). This multiplication eliminates much of the influence of systematic EUB (EDB) differentials, be them the result of systematic 95U (95D) differentials or otherwise, on the relationship between Vector Model and Sigma ROEUB (ROEDB). The bias that remains reflects the aforementioned capping and flooring when calculating Vector Model ROEUB (ROEDB), and idiosyncratic variability arising from the aforementioned differential in ticker-model date constituents in each model's Expected Body evaluation sets.

We also provide a more elegant, though less transparent metric that addresses this concern - the alpha of Vector Model ROEUB (ROEDB) to Sigma ROEUB (ROEDB) (i.e., the underlying, equally weighted ticker returns). "Alpha", as discussed in this report, is the intercept of an ordinary least squares regression of Vector Model ROEUB (ROEDB) on the underlying ticker forward returns for corresponding TMD's. It represents the expected Vector Model ROEUB (ROEDB) when Sigma ROEUB (ROEDB), i.e., the underlying ticker return, is 0.00%.

Finally, we also include 95U and 95D levels and breakage rates for the Vector Model and Sigma in the Appendix to this report, for your reference as you consider the MAE and ROEUB / ROEDB adjustments.

Determining the drivers of ROLOBC alpha

A ROEUB (ROEDB) Alpha greater than 0.00 across TMD's indicates that Vector Model EUB (EDB) moved favorably from a market timing and / or ticker selection perspective. We present that statistic alongside an average ROEUB (ROEDB)alpha calculated at the single ticker level across dates. If this second alpha is >0 it indicates that market timing added to the overall alpha, and vice versa. If this second alpha exceeds the overall alpha then it indicates that ticker selection detracted from alpha, and vice versa.

ROEUB (ROEDB) Beta

ROEUB (ROEDB)Beta represents the expected sensitivity of Vector Model ROEUB (ROEDB) to Sigma ROEUB (ROEDB), i.e., the underlying ticker return. It is the slope of the aforementioned ordinary least squares regression of Vector Model ROEUB (ROEDB) on Sigma

ROEUB (ROEDB). Like outright ROEUB (ROEDB), it must be considered in the context of 95U (95D), and like alpha it can be bifurcated to reveal additional insight.

We encourage readers to consider the Vector Model ROLOBC beta to Sigma ROLOBC in the context of how well each model's 95% VaR and OaR breakage rates compare to targeted levels. For example, if the Sigma model 95% OaR breakage is well above target and the Vector Model's 95% OaR breakage is close to target, then Vector Model 95% OaR levels are likely higher than Sigma's and if that is the case then more likely than not Vector Model EUB levels are higher than Sigma's as well. The beta of Vector Model ROEUB to Sigma ROEUB should be expected to be > 1.00 in such a situation.

A ROEUB (ROEDB) Beta greater than 1.00 across TMD's indicates that Vector Model EUB (EDB) was higher (more deeply negative) than Sigma's for more volatile dates and / or tickers. We also present an average Beta alpha calculated at the single ticker level across dates. If this second beta is >1.00 it indicates that Vector Model ROEUB (ROEDB) was higher (more deeply negative) than Sigma ROEUB (ROEDB) on more volatile days. If this second beta is less than the overall beta then it indicates that Vector Model ROEUB (ROEDB) tended to be less elevated (less deeply negative) with respect to more volatile tickers than with respect to more volatile dates.

Vector Model Input and Calculation Details

The Vector Model uses systematic price channel identification and scoring in conjunction with machine learning to provide investors with volatility forecasts that reflect the asymmetric, jumpy, clustering, and price dependent behavior of realized and option implied volatility in the financial markets.

The sole input to Vector Model and the Sigma Model out of sample OaR analytics are daily closing prices obtained from QuoteMedia.

The Vector Model was trained upon ~ 60,000 ticker model dates (TMD's) representing ~550 tickers (including equities, currencies, and commodities) and ~ 120 model dates spanning from March 9, 2002 to February 3, 2021. The Out of Sample period starts on 1/31/2022, nearly a full one year from the last model date included in the training data. All Expected Body estimates discussed in this report are for model dates beyond January 31, 2022, making them fully out of sample.

This report includes Vector Model and Sigma model results for ~150 tickers. Only about twenty of these tickers were included in the Vector Model training data set discussed above. These tickers were selected using the following criteria at the time of selection: Top and Bottom 25 S&P 500 performers, Largest 25 publicly traded issuers in the LQD and HYG etf's, constituents of the Metals and Pharmaceuticals sector within the LQD and HYG etf's, and any other tickers that at the time drew significant financial media attention (Mag 7, meme-related stocks, bitcoin related stocks). We also included several major equity and debt-oriented ETF's.

The complete Vector Model EUB and EDB coverage universe discussed in this report includes the following tickers:

AA, AAP, AAPL, ABBV, ACGL, ADBE, AMAT, AMC, AMD, AMGN, AMZN, AVGO, AZN, AZO, BA, BAC, BALL, BBY, BHC, BHP, BIIB, BMY, BUD, BXP, CAH, CCL, CDNS, CHTR, CITI, CLF, CMA, CMCSA, CMG, CNC, COST, CPRT, CSCO, CSTM, CTLT, CVS, CYH, CZR, DHI, ELAN, EMB, ETRN, EXPE, FCX, FIS, FITB, FRA, FRCB, FSUGY, GBTC, GE, GILD, GLD, GME, GNRC, GOLD, GOOGL, GS, GSK, GT, GWW, HCA, HD, HLT, HON, HSBC, HYG, IEP, INTC, INTU, IRM, ISRG, JAZZ, JPM, KALU, KEY, KHC, LEN, LLY, LNC, LQD, LUMN, LVS, LW, META, MNST, MOS, MRK, MS, MSFT, MSI, MSTR, MU, MUB, NAVI, NEM, NFLX, NVDA, NVS, NWL, ON, ORCL, ORLY, OXY, PCG, PEP, PHM, POST, PRGO, PWR, QCOM, QQQ, RIO, SBNY, SBUX, SIVBQ, SLV, SNY, SPY, T, TDG, TEVA, TFC, THC, TLT, TMUS, TRGP, TSLA, TXN, UAA, UNH, USB, VCSH, VFC, VICI, VNO, VST, VZ, WDC, WFC, WRK, WYNN, X, XOM, ZION, ZTS.

The Vector Model is described further in the FAQ and Blog of vecviz.com.

Sigma Details

The core of Sigma, as presented alongside Vector Model output by VecViz, is the standard deviation of price-based returns that very likely gets discussed in any introductory book on risk or portfolio management. This is the same definition of volatility that is utilized in the Black Scholes option pricing formula. Sigma's flaws as an estimate of forward volatility are well documented. Nevertheless, it remains perhaps the most popular metric for "risk" when it comes to investments, likely because of its simplicity and familiarity.

We present Sigma based on daily logarithmic price returns (akin to % changes in price), and a lookback period of two years. To enhance Sigma's accuracy, we apply a 6-month half-life rate of decay to the weightings applied to the daily returns used to calculate Sigma. This weighting scheme causes the most recent 6 month period to be weighted 8x the least recent 6 month period in the 2 year look back window.

Sigma is converted to probabilities by applying multipliers associated with the standard normal (i.e. Gaussian) distribution with a mean of 0 and sigma of 1.00. Thus, 95% VaR is assumed to be-1.645 sigma's lower than the current price and 99% VaR is presumed to be-2.326 sigma's lower than the current price.

Sigma based probability percentiles for longer time horizons are obtained by multiplying Sigma calculated from daily closing prices by the square root of the number of trading days in the given horizon. In doing so, we are assuming daily returns are independent and identically distributed. So, for example, the multiplier that converts daily horizon sigma to 1 year horizon sigma is the square root of 252 (~15.9).

All calculations for Sigma are based on the same pricing data obtained from QuoteMedia data used to calculate Vector Model VaR.

All Sigma estimates discussed in this report are for dates beyond January 31, 2022, the end of the training period for the Vector Model. See the Appendix for the derivation of 0.657 as the Sigma multiplier that is used to calculate Sigma EUB and Sigma EDB.

Using this report

This report is ~200 pages long. Some tips to help you navigate: 1) Clicking on the page headings in the Table of Contents will instantly take you to the corresponding page.
2) Use Ctrl-F to search for tickers of interest, to see what Top/Bottom contributor lists they land on, and for what horizons 3) Click Ctrl-Home to return to the Table of Contents

Important considerations about the analytics and performance metrics presented in this report:

1) Past performance is no guarantee of future results. None of the content in this report is investment advice or an offer to buy or sell securities. VecViz is not a SEC investment advisor or broker-dealer. The staff of VecViz actively transacts in securities tied to many of the tickers discussed in this report.
   See VecViz's Terms and Conditions for more context and detail at https://vecviz.com/terms-and-conditions/

2) Read ""Let me warn you…" of the limitations of VecViz's Analytics.", a blog entry on vecviz.com (https://vecviz.com/let-me-warn-you-of-the-limitations-of-vecvizs-analytics/)

3) There are many volatility models that the Vector Model could be compared to beyond Sigma. Thus, even if this report causes you to conclude that the Vector Model's Expected Body metrics outperforms Sigma Expected Body metrics, you should not necessarily conclude that Vector Model Expected Body metrics are the best for your purposes. See the discussion of some of the other types of volatilty models in this blog for more detail, as Expected Body metrics could likely be calculated from them as well: https://vecviz.com/an-llms-comparison-of-vecviz-to-established-vol-models/

4) All MAE and ROEUB and ROEDB performance statistics are as of the end of the horizon only. All interim price movement is ignored.

5) Clearly, all horizons > 1d overlap when considered on a daily basis. Please note that the volatility of overlapping periodic returns is understated, because each observation shares return experience with other observations for such time horizons.
   Thus, we advise against considering any perceived volatility or volatility related metrics for multi-day horizons in isolation, including p-values for alpha and beta statistics. However, we do believe that their use is valid for comparing the Vector Model to Sigma, whose multi-day horizon ROLOBC returns are calculated similarly.

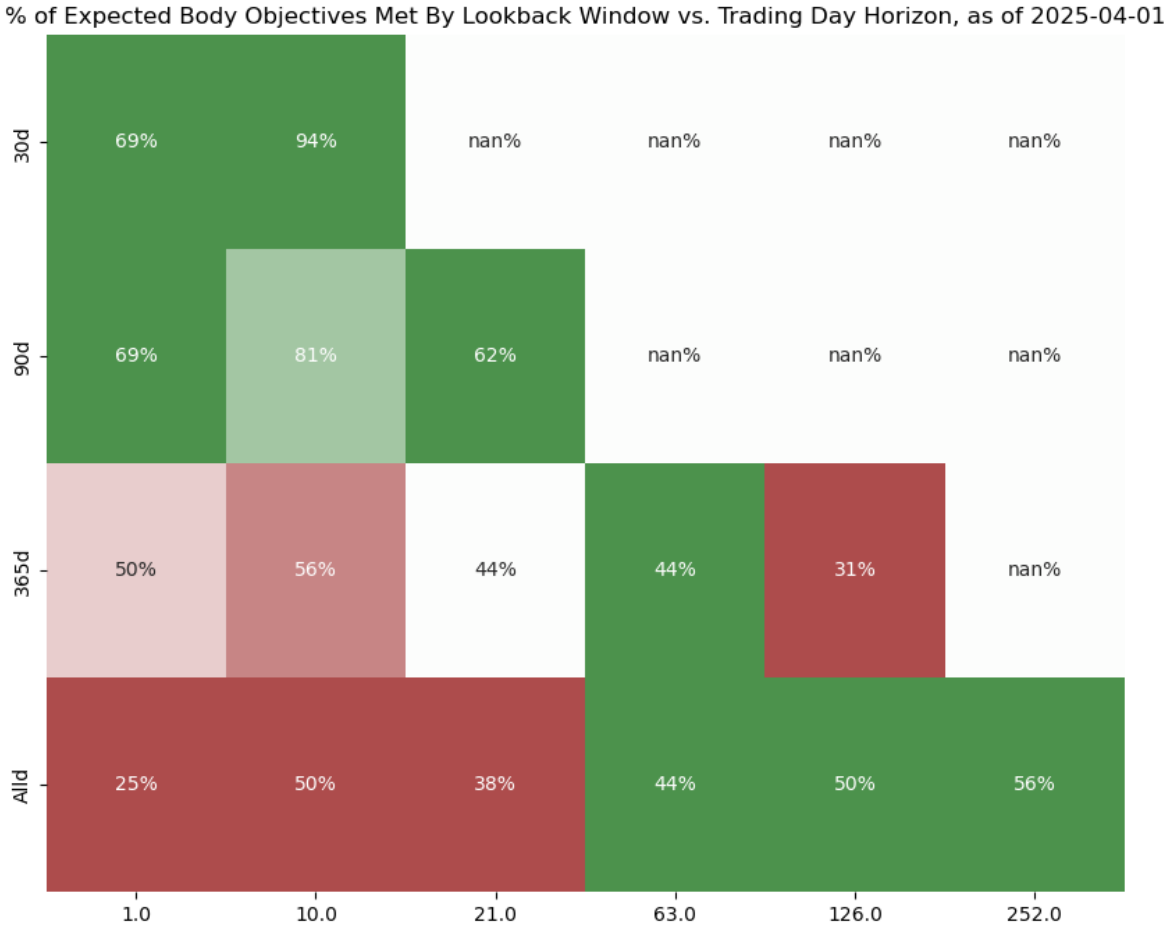
6) We are not considering transaction costs. The turnover and therefore transaction costs experienced by Vector Model ROEUB or ROEDB based investors resulting in the change in the ratio between Vector Model and Sigma ROEUB or ROEDB is completely ignored.

7) We are not incorporating any financing charges or margin-related costs for implied "levered" ROEUB or ROEDB positions.

Thus, in summary, all metrics presented in this report are presented and are to be considered on a comparative basis. Are Vector Model breakage rates closer to target than Sigma's? Does Vector Model ROEUB or ROEDB outperform Sigma ROEUB or ROEDB? Is the relative performance driven by alpha or beta? By timing or ticker selection? What tickers contribute or detract the most from the relative performance? These are the questions this report is structured to answer.

Expected Body Objectives "Report Card"

Period examined: AllD = 2022-01-31 through 2025-03-28 while 365D /90D/ 30D include the 365/90/30 days ended 2025-03-28, respectively.



EB Criteria	Average Score(%)
1. Smaller EUB MAE (mean absolute error)	6.25
2. Smaller EUB MAE after 95%tile adjustment	25
3. Less adjusted EUB MAE Variability across dates	37.5
4. Less adjusted EUB MAE Variability across tickers	31.25
5. Smaller EDB MAE	25
6. Smaller EDB MAE after 95%tile adjustment	50
7. Less adjusted EDB MAE Variability across dates	37.5
8. Less adjusted EDB MAE Variability across tickers	37.5
9. Greater ROEUB	93.75

EB Criteria	Average Score(%)
10. Greater ROEUB after adjusting for EUB magnitude	100
11. ROEUB alpha across tickers and dates > 0	87.5
12. ROEUB alpha across dates > 0	75
13. Greater ROEDB	56.25
14. Greater ROEDB after adjusting for EDB magnitude	50
15. ROEDB alpha across tickers and dates > 0	62.5
16. ROEDB alpha across dates > 0	87.5
Overall Average	53.91

See the prior page for associated definitions of the criteria.

Observations as of 2025-03-28

1. Expected Body accuracy and return oriented metrics met 54% of their objectives.
2. Performance has been strong over the last 30 and 90 days after lagging earlier in the prior 365 day period relative to the prior 2 years.

3. Return oriented metrics scored much higher than the accuracy related metrics
4. Alpha across dates was stronger than alpha across tickers and dates for both ROEDB, suggesting EDB metrics have more to offer fronm a returns impact perspective in terms of timing of exposures than ticker selection. Opposite is the case for ROEUB / EUB metrics, where alpha across tickers and dates outperformed alpha across dates alone.

5. EDB based metrics outperformed EUB based metrics in terms of both accuracy (EDB MAE outperformed EDB MAE) and returns (ROEDB outperformed ROEUB).

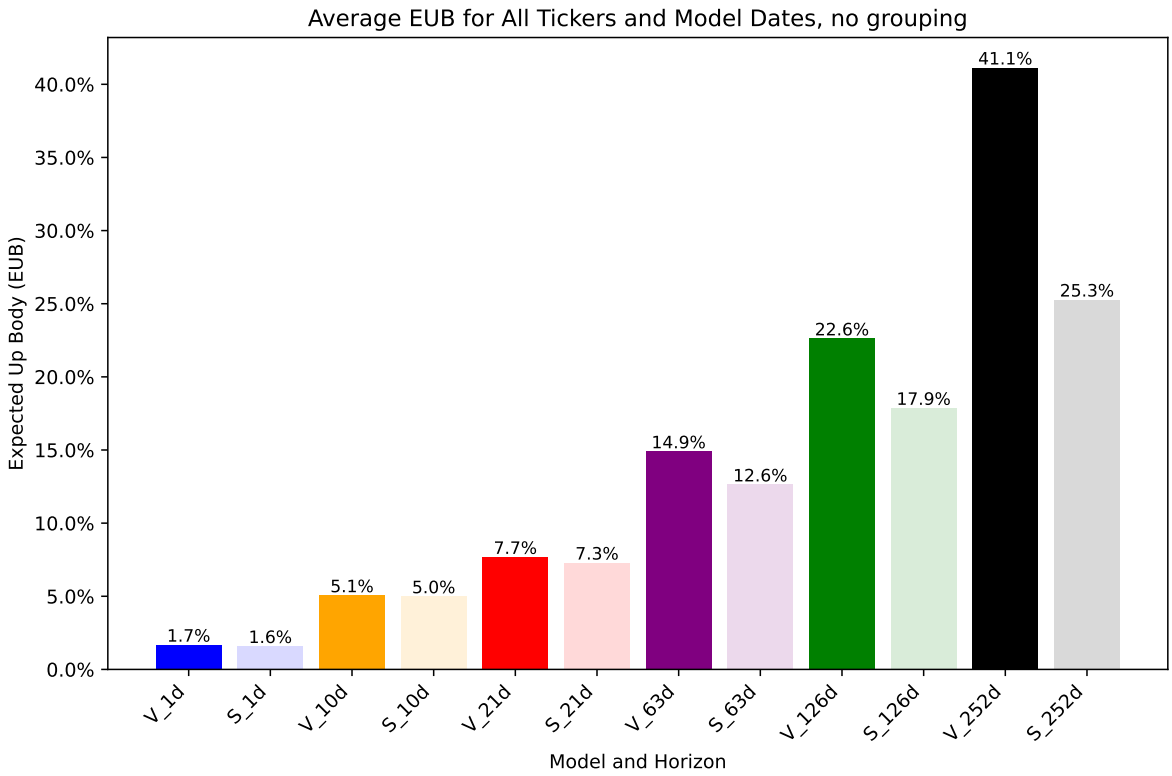
Expected Up Body (EUB)

Historic Average Levels

Here we compare Vector Model ("V", dark shading) and Sigma ("S", light shading) EUB levels by horizon, on average across all ticker-model dates for the lookback window indicated.

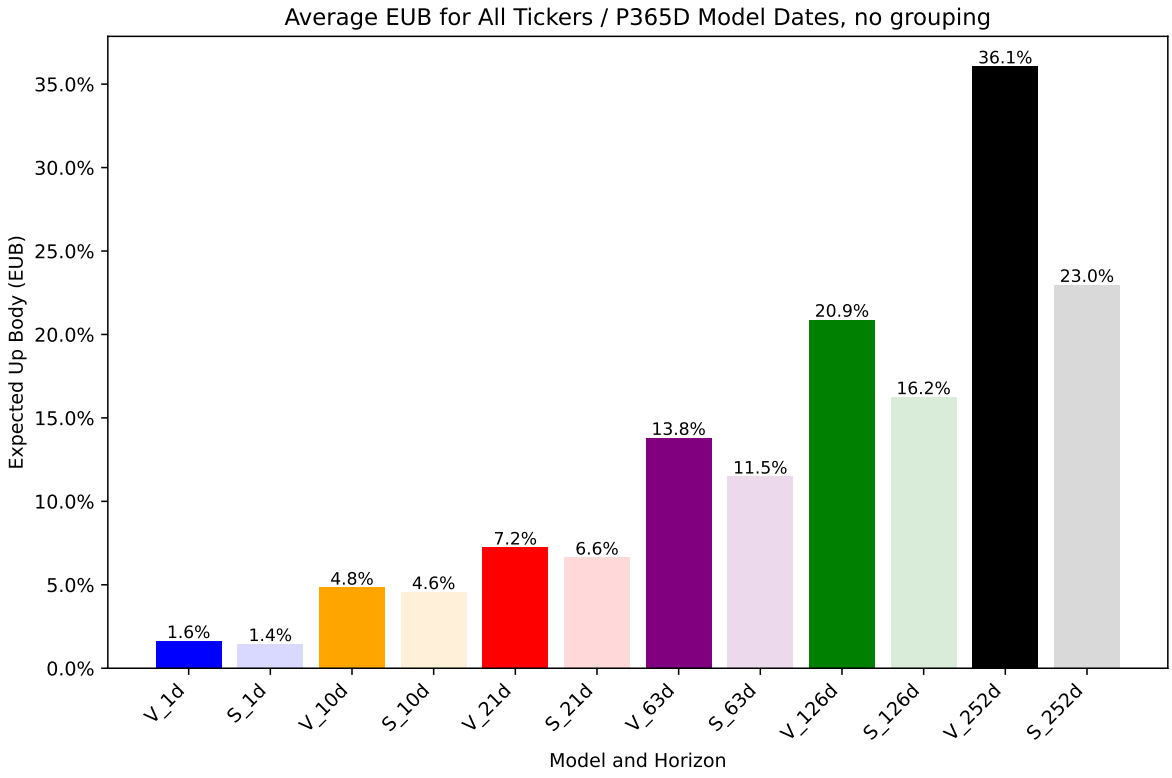
All Out of Sample Model Dates

Period examined: All model dates from 2022-01-31 through 2025-03-28



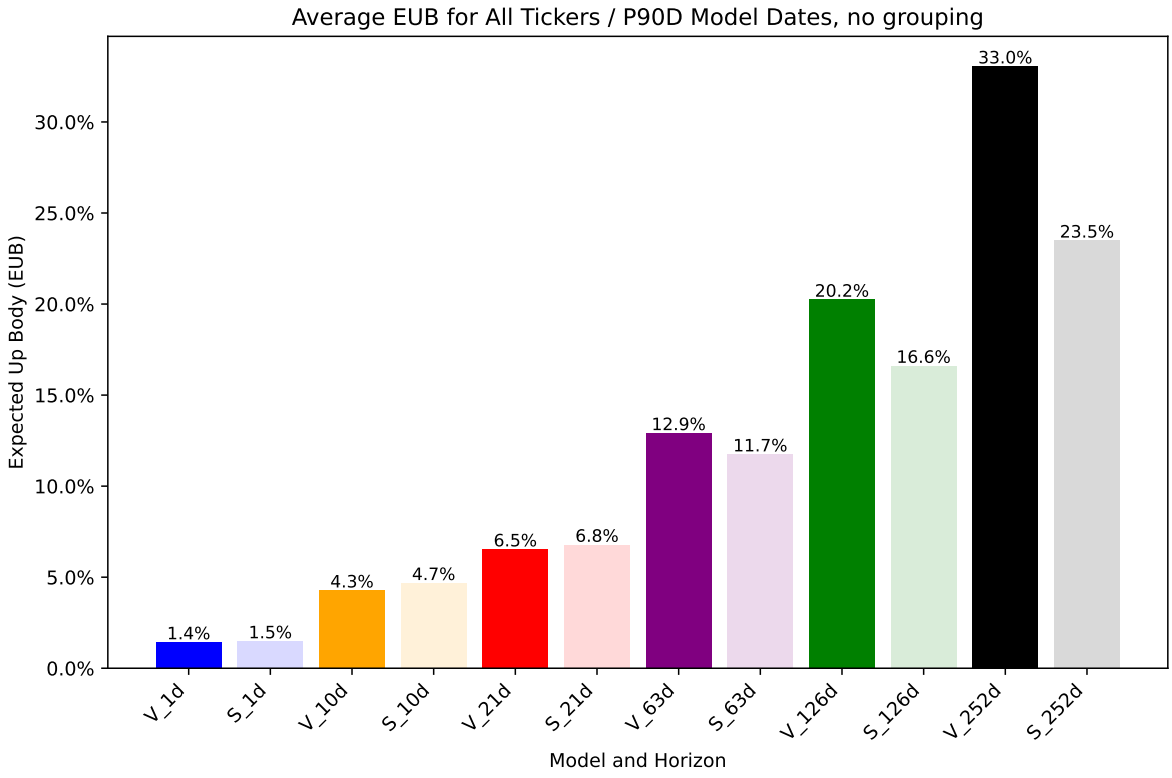
Prior 365 Calendar Days (P365D)

Period examined: All model dates from 2024-04-02 through 2025-03-28



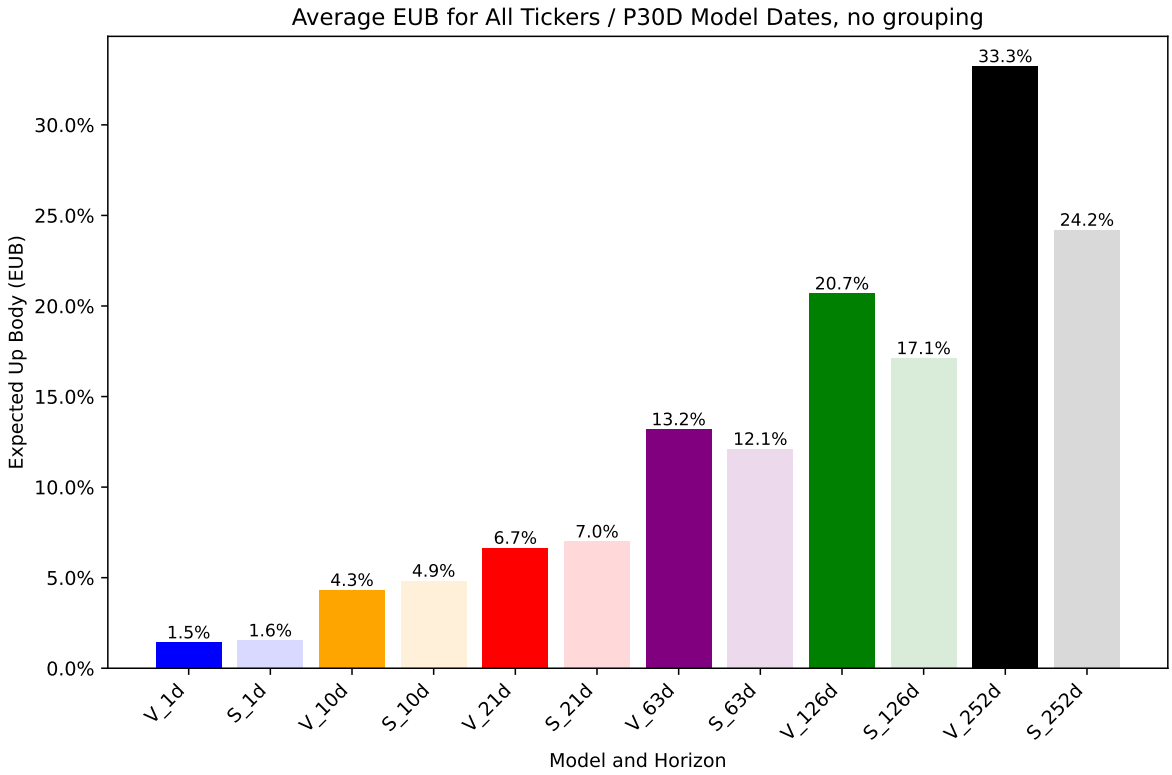
Prior 90 Calendar Days (P90D)

Period examined: All model dates from 2025-01-02 through 2025-03-28



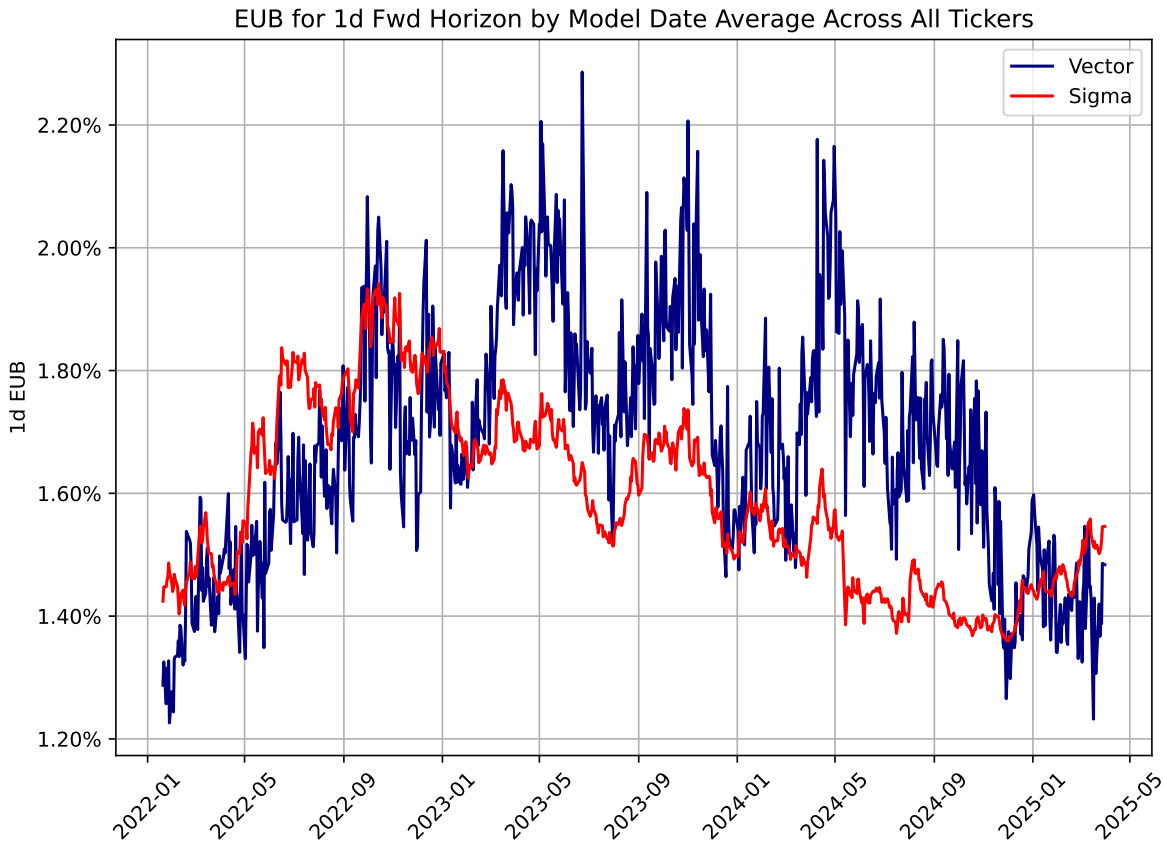
Prior 30 Calendar Days (P30D)

Period examined: All model dates from 2025-03-03 through 2025-03-28

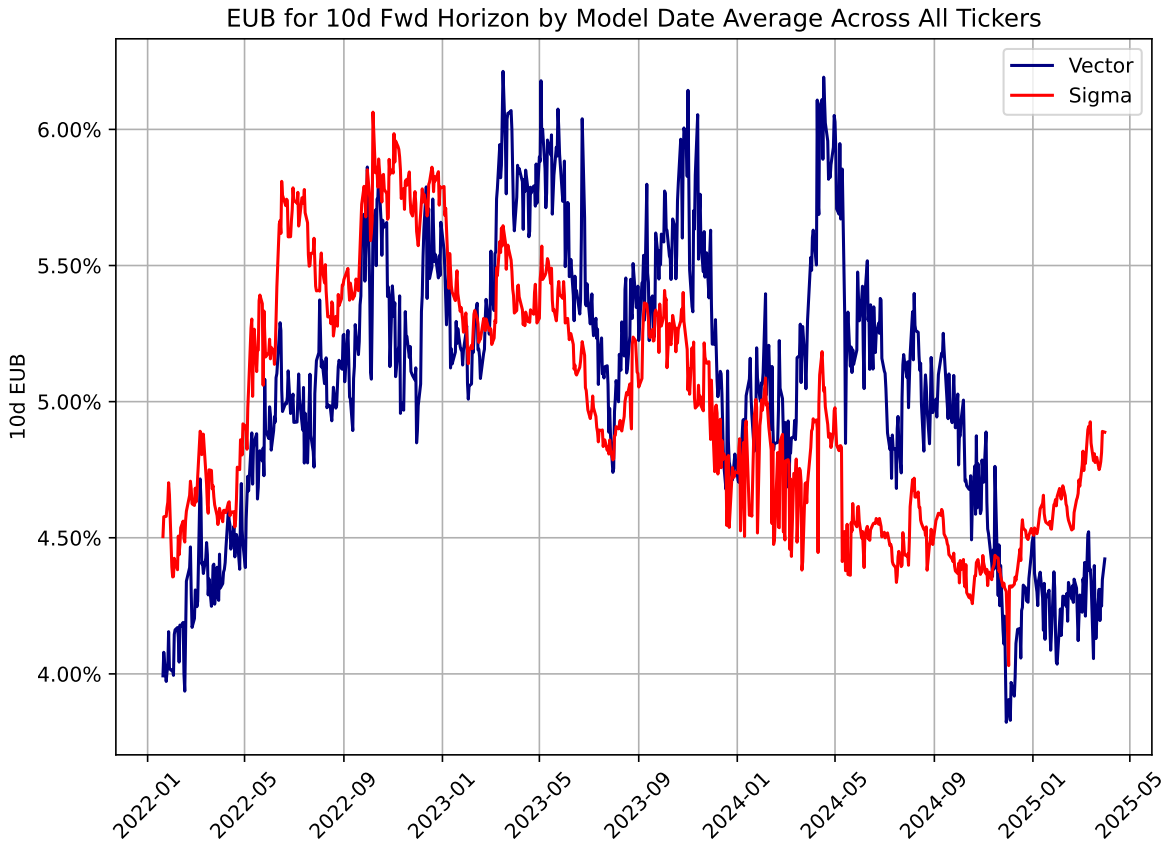


EUB by Model Date Detail

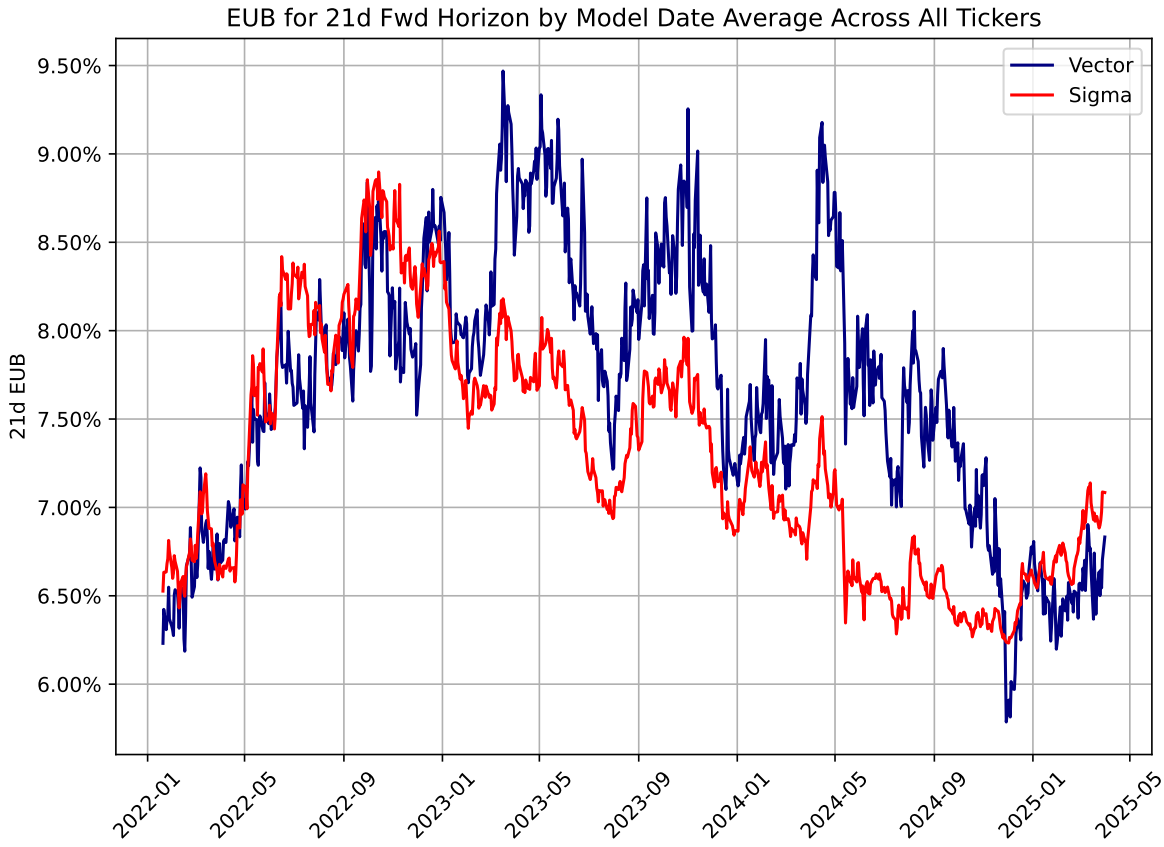
1d Horizon



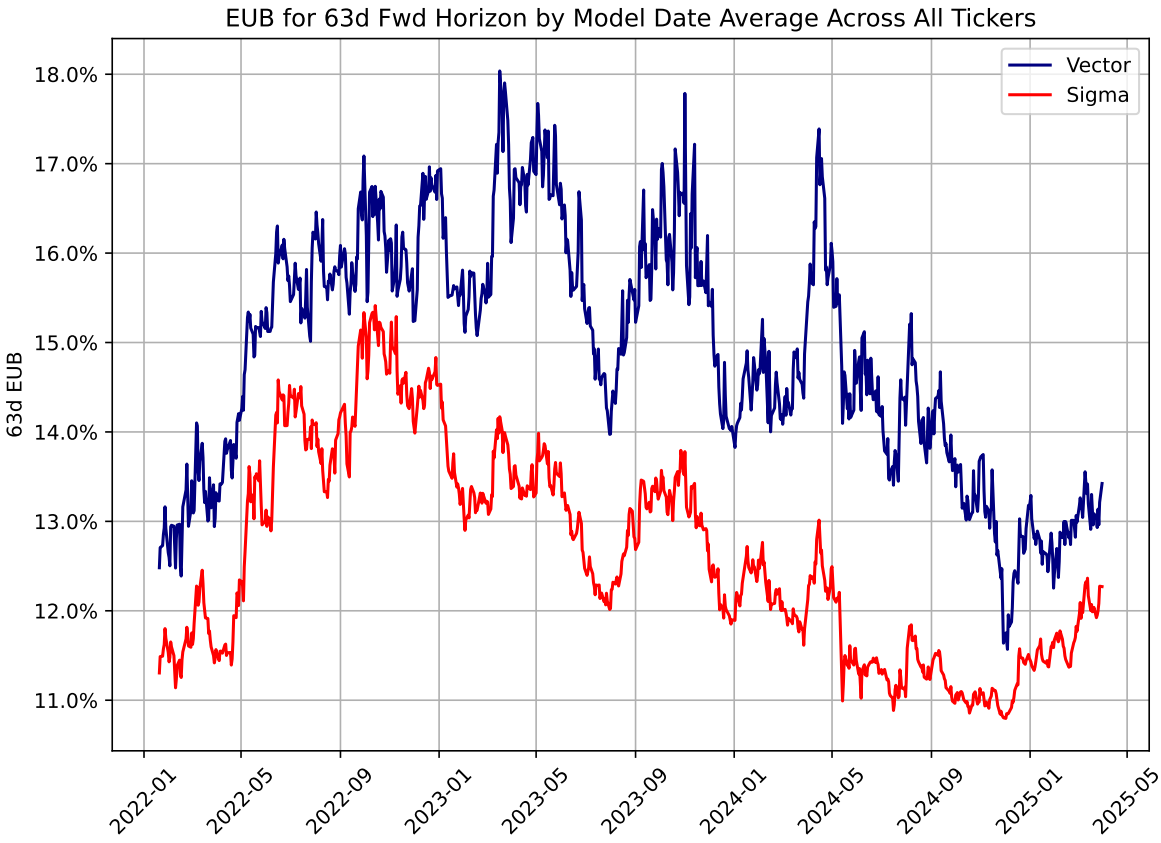
10d Horizon


EUB for 10d Fwd Horizon by Model Date Average Across All Tickers
Vector
Sigma
10d EUB
6.00%
5.50%
5.00%
4.50%
4.00%
2022-01
2022-05
2022-09
2023-01
2023-05
2023-09
2024-01
2024-05
2024-09
2025-01
2025-05

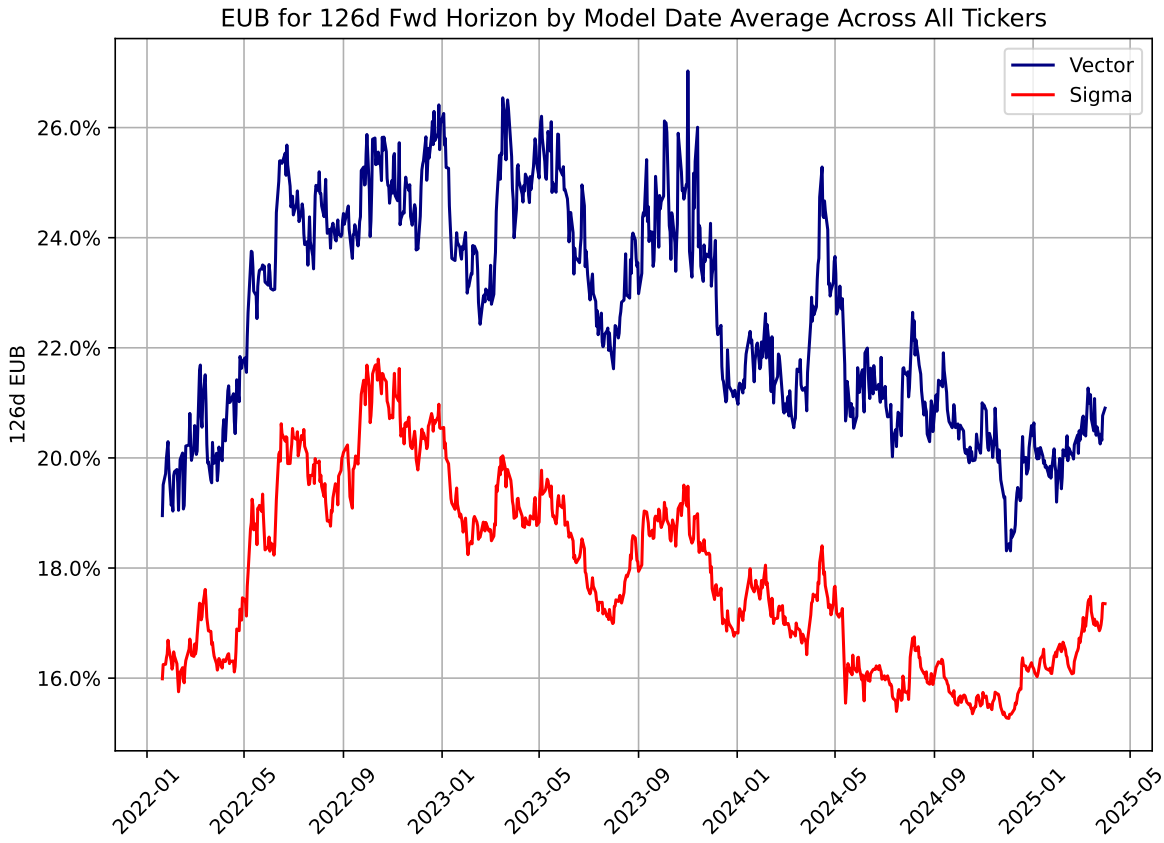
21d Horizon


EUB for 21d Fwd Horizon by Model Date Average Across All Tickers
Vector
Sigma
21d EUB
9.50%
9.00%
8.50%
8.00%
7.50%
7.00%
6.50%
6.00%
2022-01
2022-05
2022-09
2023-01
2023-05
2023-09
2024-01
2024-05
2024-09
2025-01
2025-05

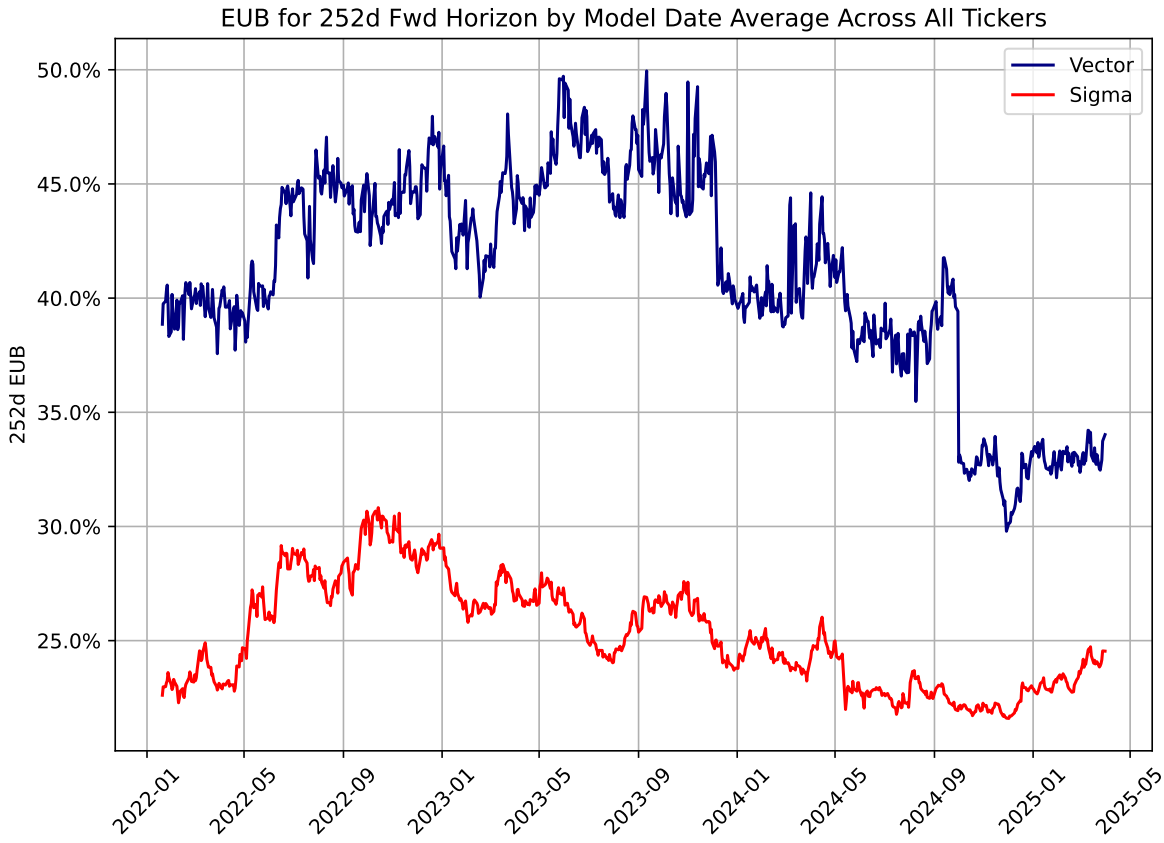
63d Horizon


EUB for 63d Fwd Horizon by Model Date Average Across All Tickers
Vector
Sigma
63d EUB
18.0%
17.0%
16.0%
15.0%
14.0%
13.0%
12.0%
11.0%
2022-01
2022-05
2022-09
2023-01
2023-05
2023-09
2024-01
2024-05
2024-09
2025-01
2025-05

126d Horizon



252d Horizon



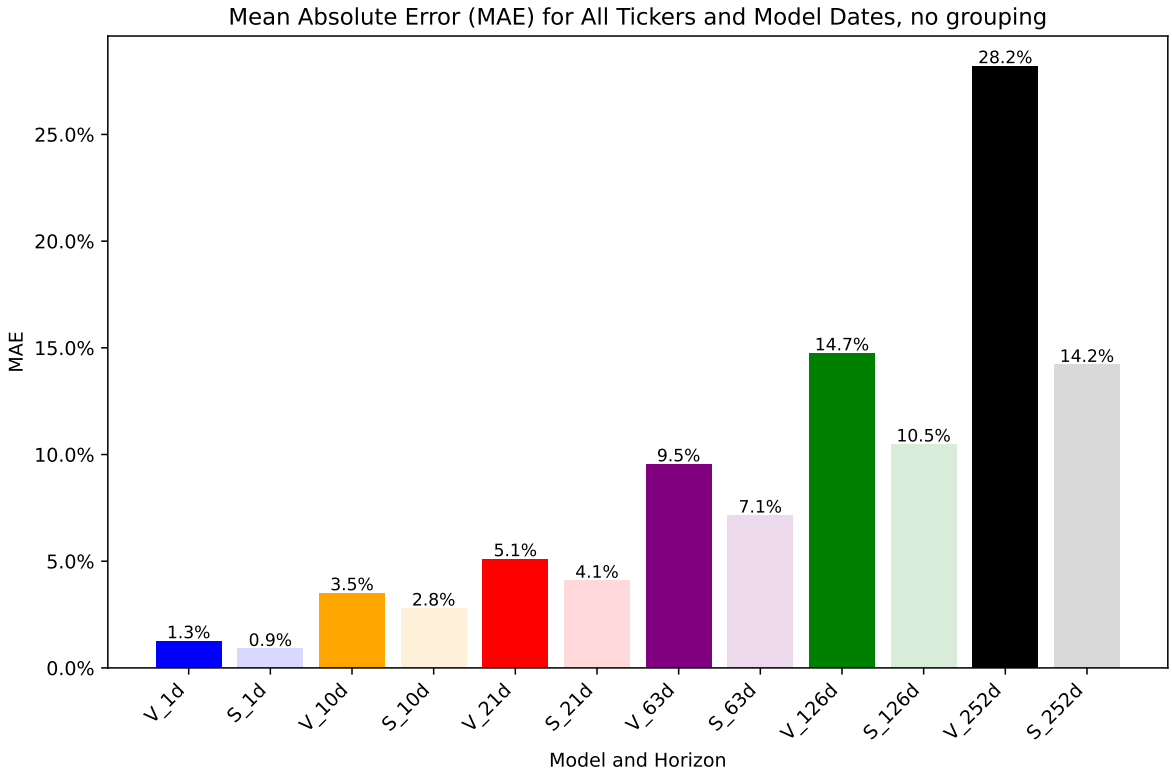
Performance Summary - MAE of EUB vs. Actual Fwd Returns

We use Mean Absolute Error (MAE) to assess how accurate Vector Model EB metrics are relative to those based upon Sigma.

Performance includes only those ticker - model dates whose foward performance is directionally "up" but inside of the 95th %tile forecasted for given model. Thus, these statistics are not perfectly comparable across models, or even horizons. Consider them alongside each model's breakage rates for the 95U percentile (i.e., OaR breakage rates).

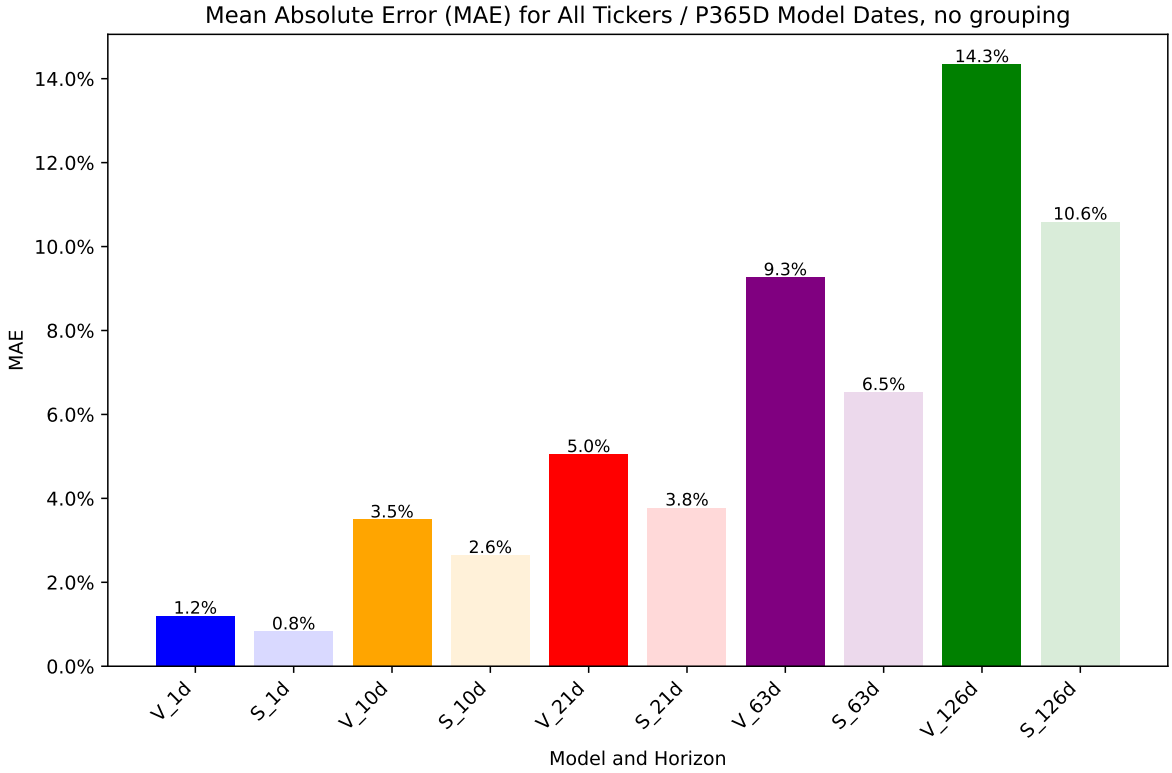
All Out of Sample Model Dates

Period examined: All model dates from 2022-01-31 through 2025-03-28



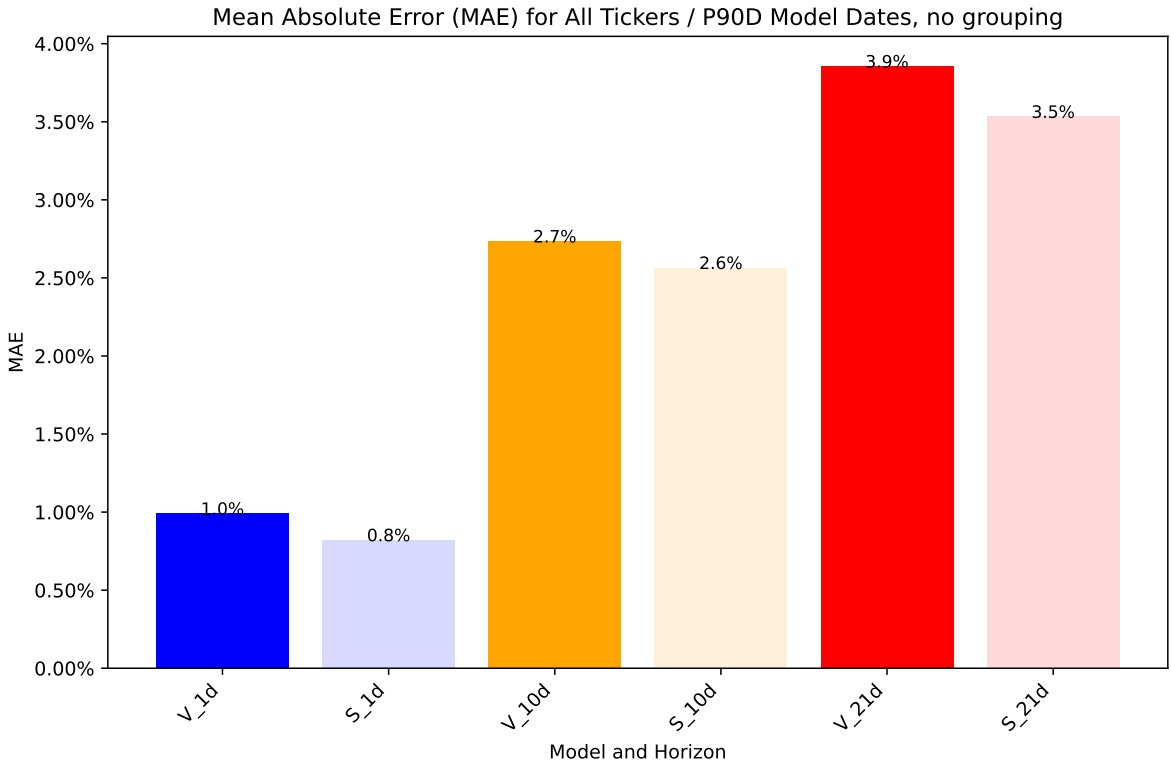
Prior 365 Calendar Days (P365D)

Period examined: All model dates from 2024-04-02 through 2025-03-28



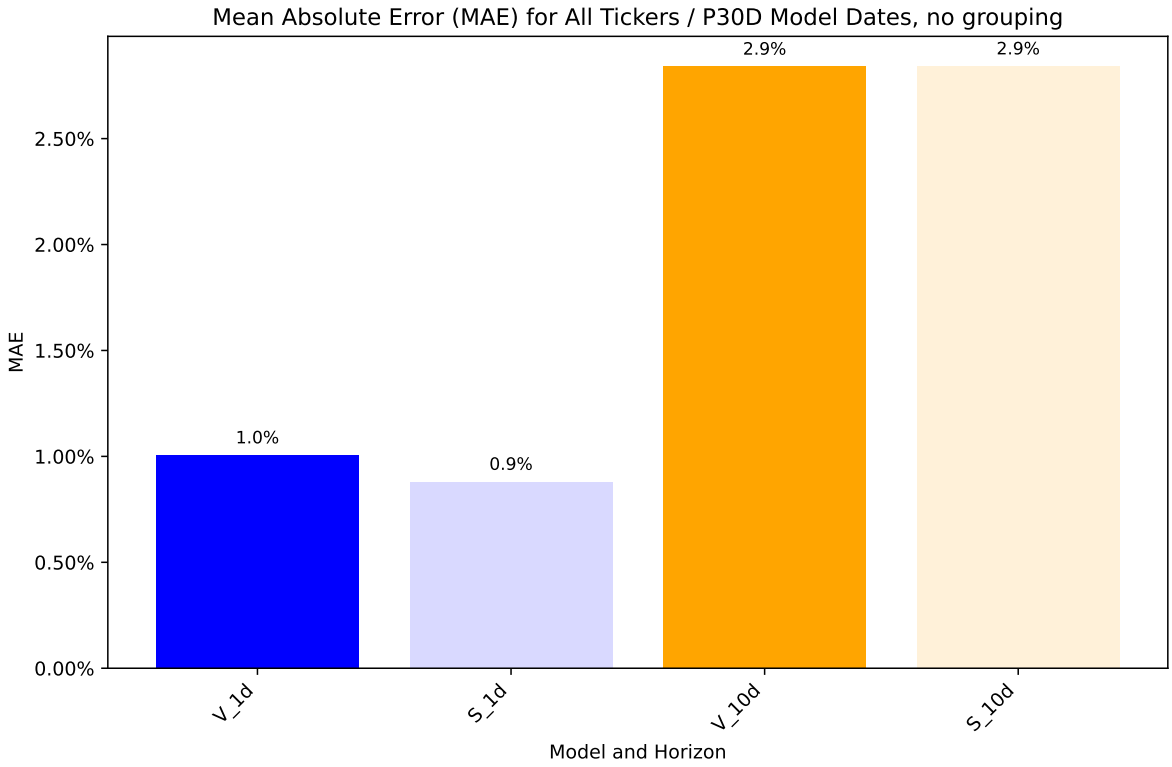
Prior 90 Calendar Days (P90D)

Period examined: All model dates from 2025-01-02 through 2025-03-28



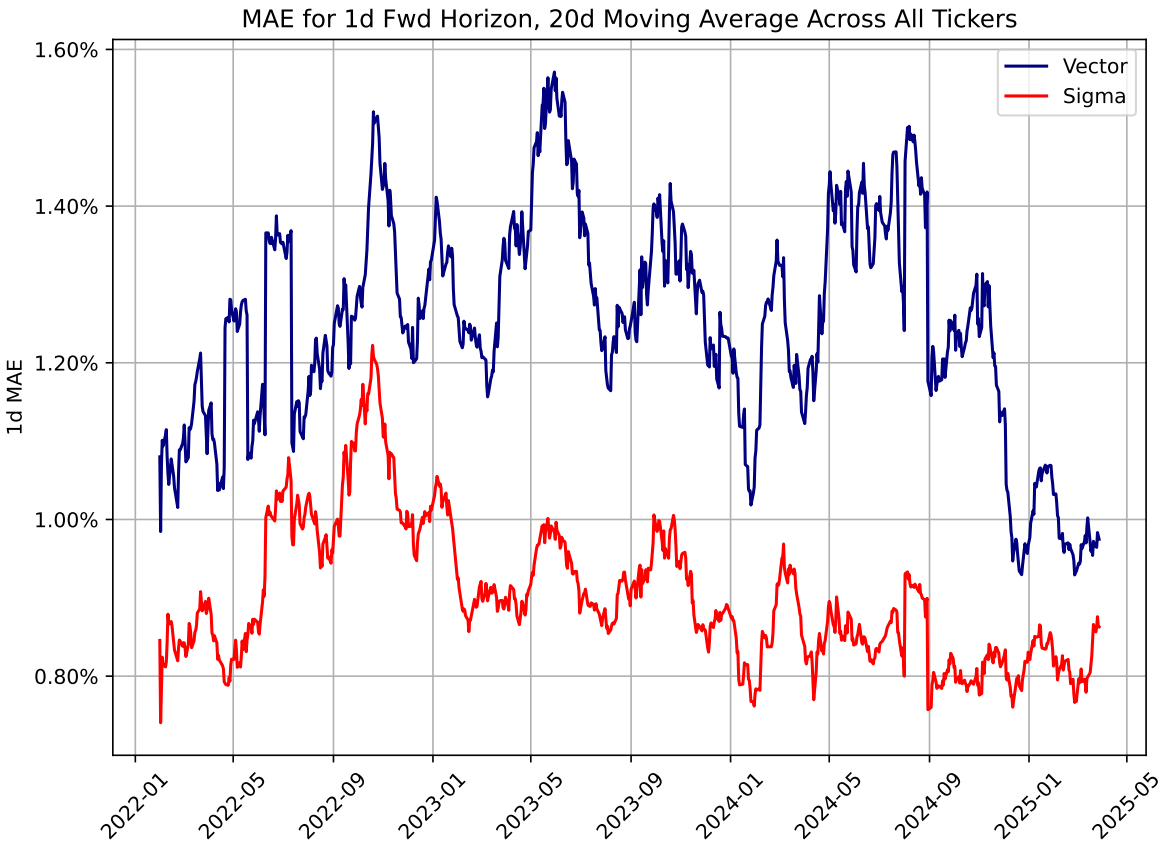
Prior 30 Calendar Days (P30D)

Period examined: All model dates from 2025-03-03 through 2025-03-28

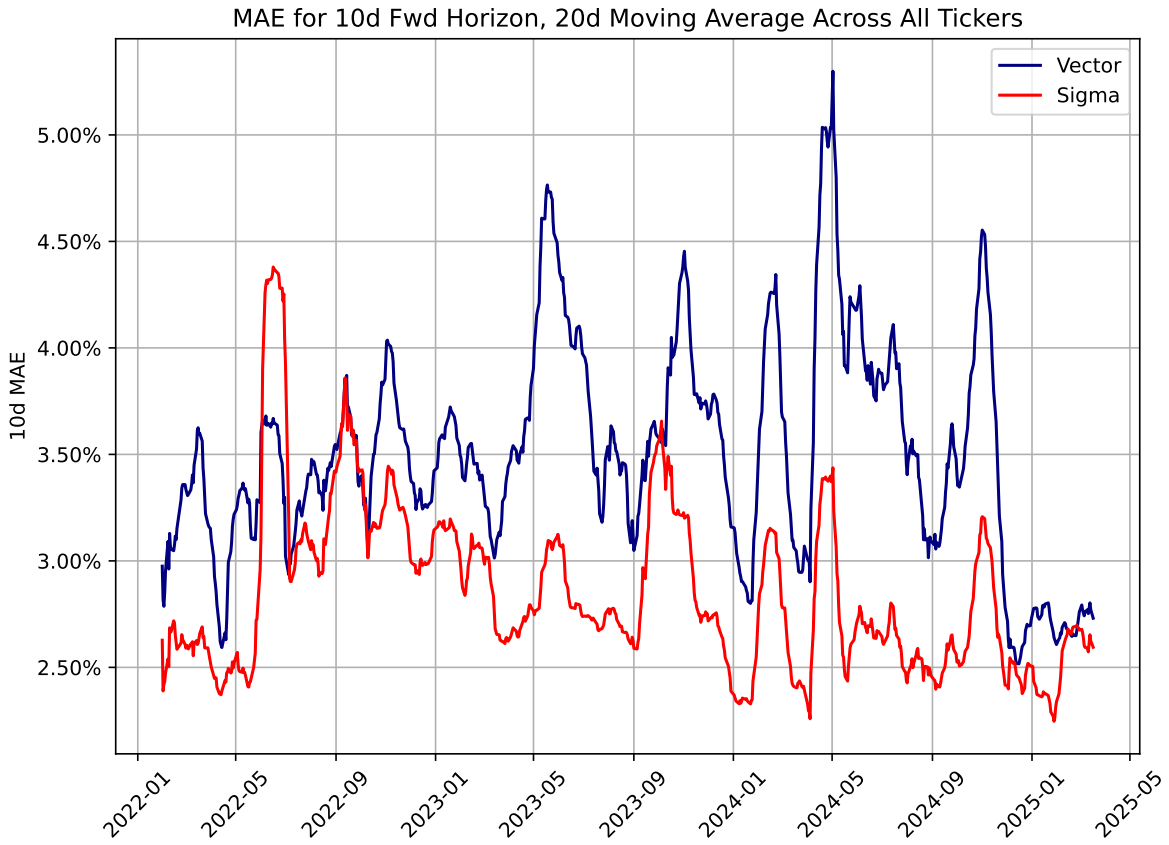


MAE by Model Date Detail

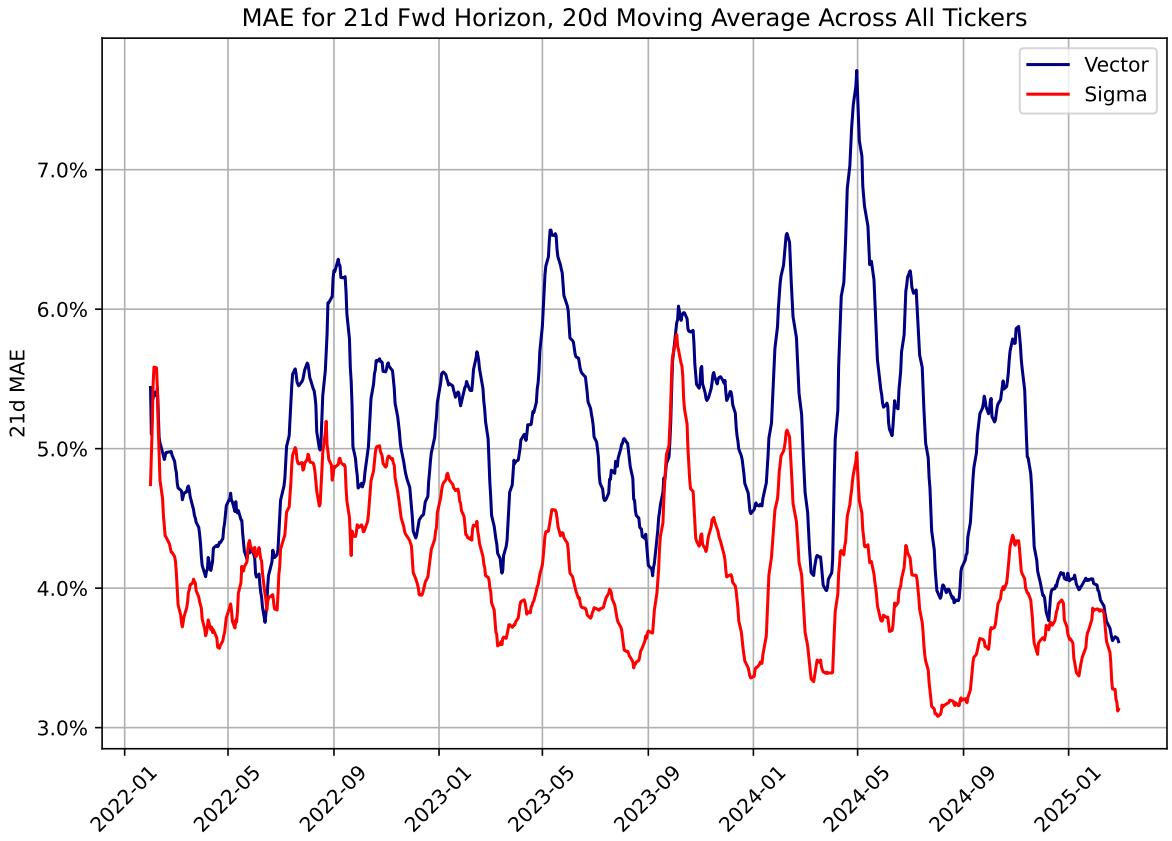
1d Horizon



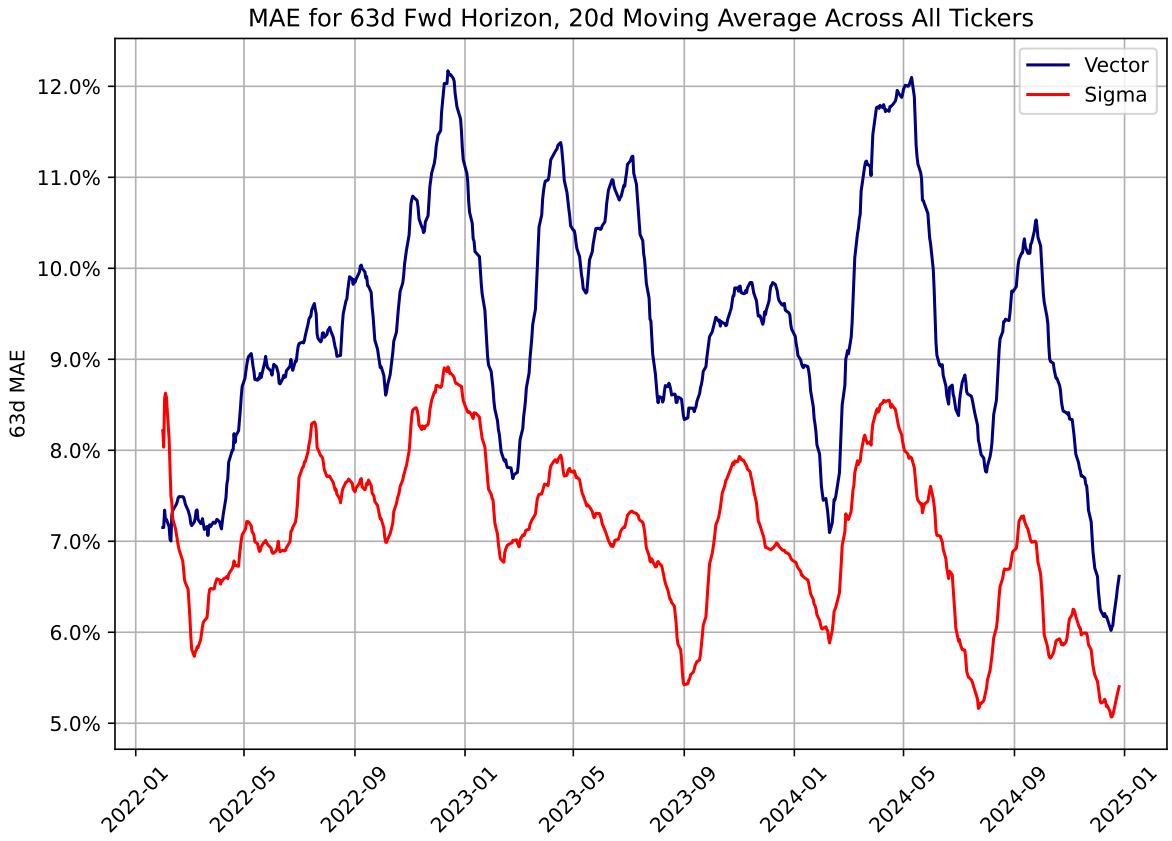
10d Horizon


MAE for 10d Fwd Horizon, 20d Moving Average Across All Tickers
Vector
Sigma
10d MAE
5.00%
4.50%
4.00%
3.50%
3.00%
2.50%
2022-01
2022-05
2022-09
2023-01
2023-05
2023-09
2024-01
2024-05
2024-09
2025-01
2025-05

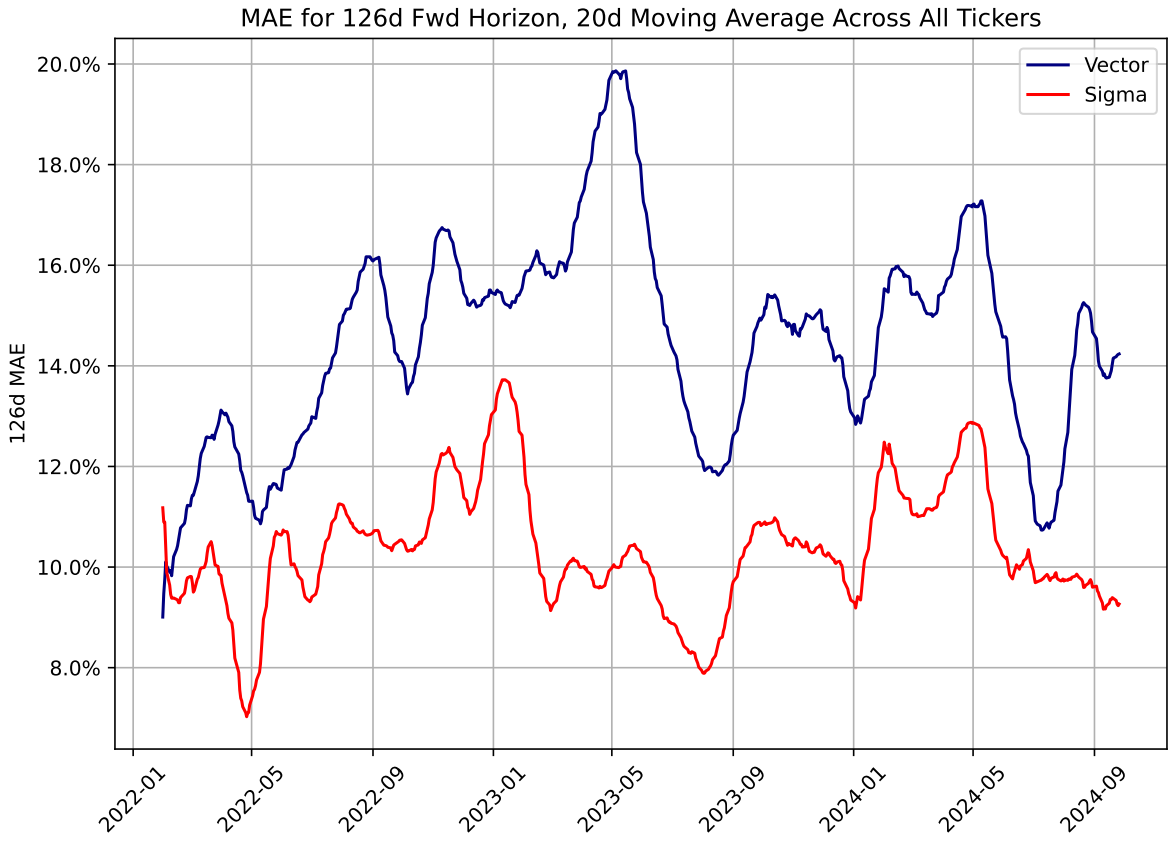
21d Horizon


MAE for 21d Fwd Horizon, 20d Moving Average Across All Tickers
Vector
Sigma
21d MAE
7.0%
6.0%
5.0%
4.0%
3.0%
2022-01
2022-05
2022-09
2023-01
2023-05
2023-09
2024-01
2024-05
2024-09
2025-01

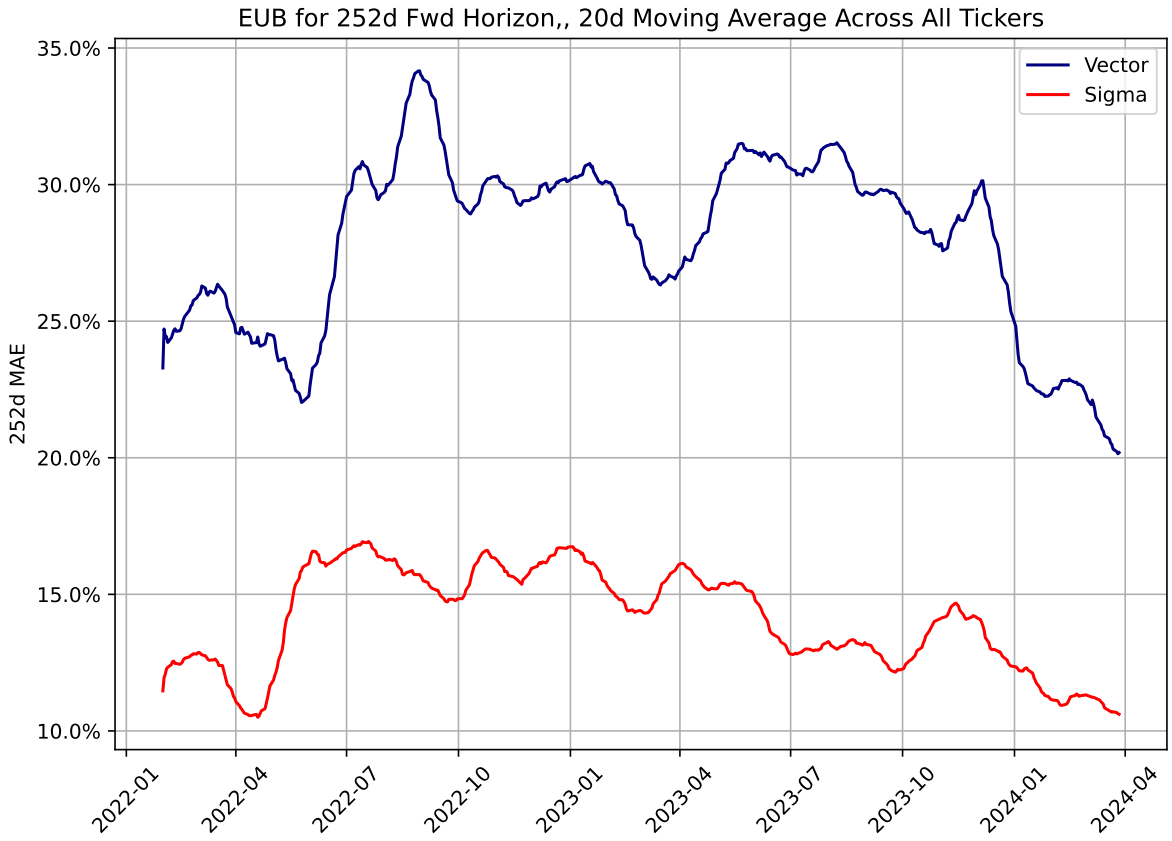
63d Horizon


MAE for 63d Fwd Horizon, 20d Moving Average Across All Tickers
Vector
Sigma
63d MAE
12.0%
11.0%
10.0%
9.0%
8.0%
7.0%
6.0%
5.0%
2022-01
2022-05
2022-09
2023-01
2023-05
2023-09
2024-01
2024-05
2024-09
2025-01

126d Horizon



252d Horizon



Top 30 Tickers By EUB MAE

All TMD: 1d

Results reflect ticker level average EUB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EUB" metric - positive performance within the expected 95%tile.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EUB-MAE_V	Ticker_S	EUB-MAE_S
1.0	AMC	12.93%	AMC	10.67%
1.0	LUMN	8.04%	GME	3.45%
1.0	IEP	7.38%	CYH	3.02%
1.0	TSLA	4.84%	LUMN	2.45%
1.0	ELAN	4.82%	MSTR	2.3%
1.0	CYH	4.31%	GBTC	2.25%
1.0	BHC	3.15%	BHC	1.89%
1.0	CCL	2.94%	IEP	1.49%
1.0	GBTC	2.94%	CTLT	1.49%
1.0	NWL	2.71%	UAA	1.47%
1.0	GNRC	2.58%	TSLA	1.45%
1.0	VNO	2.45%	CCL	1.43%
1.0	CZR	2.39%	AA	1.43%
1.0	BXP	2.29%	GT	1.37%
1.0	T	2.26%	GNRC	1.37%
1.0	MSTR	2.07%	SIVBQ	1.36%
1.0	GT	1.98%	CZR	1.34%
1.0	LNC	1.96%	CLF	1.33%
1.0	NVDA	1.94%	VFC	1.32%
1.0	MSFT	1.73%	NWL	1.25%
1.0	UAA	1.72%	SBNY	1.22%
1.0	MOS	1.63%	LNC	1.2%
1.0	X	1.61%	AAP	1.19%
1.0	AVGO	1.59%	AMD	1.18%
1.0	AMD	1.55%	ELAN	1.17%
1.0	ON	1.54%	NVDA	1.16%
1.0	AA	1.49%	X	1.11%
1.0	AMAT	1.49%	ON	1.11%
1.0	QQQ	1.48%	NFLX	1.08%
1.0	INTC	1.47%	EXPE	1.07%

All TMD: 10d

Results reflect ticker level average EUB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EUB" metric - positive performance within the expected 95%tile.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EUB-MAE_V	Ticker_S	EUB-MAE_S
10.0	AMC	49.67%	AMC	32.71%
10.0	LUMN	23.1%	GME	11.03%
10.0	IEP	16.0%	LUMN	8.84%
10.0	ELAN	12.98%	CYH	7.94%
10.0	TSLA	11.83%	MSTR	7.29%
10.0	BHC	9.12%	BHC	6.38%
10.0	GBTC	8.93%	GBTC	6.34%
10.0	CYH	8.83%	SIVBQ	4.75%
10.0	NWL	7.68%	AA	4.74%
10.0	CZR	7.36%	UAA	4.62%
10.0	GNRC	7.09%	IEP	4.58%
10.0	CCL	6.86%	GT	4.55%
10.0	NVDA	6.34%	CCL	4.49%
10.0	GT	6.24%	CZR	4.42%
10.0	LNC	5.95%	GNRC	4.33%
10.0	MSTR	5.61%	TSLA	4.25%
10.0	BXP	5.32%	LNC	4.16%
10.0	MSFT	5.26%	SBNY	4.11%
10.0	AMD	5.04%	AMD	4.05%
10.0	VNO	5.03%	ELAN	4.0%
10.0	X	4.91%	CTLT	3.94%
10.0	MOS	4.78%	NWL	3.94%
10.0	UAA	4.74%	CLF	3.91%
10.0	T	4.65%	VFC	3.9%
10.0	INTC	4.56%	ON	3.76%
10.0	ON	4.08%	NVDA	3.7%
10.0	QQQ	4.06%	AAP	3.68%
10.0	AA	4.04%	INTC	3.66%
10.0	AVGO	4.03%	X	3.61%
10.0	AMAT	4.0%	EXPE	3.46%

All TMD: 21d

Results reflect ticker level average EUB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EUB" metric - positive performance within the expected 95%tile.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EUB-MAE_V	Ticker_S	EUB-MAE_S
21.0	AMC	70.1%	AMC	49.05%
21.0	LUMN	26.9%	GME	16.21%
21.0	IEP	22.71%	LUMN	12.16%
21.0	ELAN	20.17%	CYH	12.08%
21.0	TSLA	16.73%	MSTR	10.02%
21.0	BHC	13.17%	GBTC	8.89%
21.0	CCL	12.09%	BHC	8.01%
21.0	GBTC	11.07%	CCL	7.66%
21.0	CYH	11.05%	UAA	7.46%
21.0	CZR	10.97%	IEP	7.23%
21.0	NWL	10.37%	SIVBQ	7.04%
21.0	GNRC	9.87%	TSLA	6.88%
21.0	MSTR	9.84%	GT	6.54%
21.0	NVDA	9.65%	AA	6.54%
21.0	GT	9.56%	NWL	6.24%
21.0	LNC	8.31%	AMD	6.21%
21.0	BXP	7.94%	CZR	6.19%
21.0	UAA	7.67%	GNRC	6.11%
21.0	VNO	7.64%	ELAN	6.1%
21.0	MSFT	7.57%	VFC	6.09%
21.0	MOS	7.54%	CLF	5.88%
21.0	AMD	7.31%	CTLT	5.63%
21.0	AMAT	6.97%	NVDA	5.62%
21.0	X	6.86%	ON	5.5%
21.0	INTC	6.61%	AAP	5.36%
21.0	T	6.54%	SBNY	5.33%
21.0	ON	6.47%	ZION	5.32%
21.0	AA	6.28%	NFLX	5.26%
21.0	SIVBQ	6.2%	VNO	5.25%
21.0	NFLX	5.97%	LNC	5.25%

All TMD: 63d

Results reflect ticker level average EUB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EUB" metric - positive performance within the expected 95%tile.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EUB-MAE_V	Ticker_S	EUB-MAE_S
63.0	AMC	193.29%	AMC	111.02%
63.0	LUMN	66.67%	LUMN	32.3%
63.0	ELAN	37.06%	GME	31.36%
63.0	TSLA	34.91%	CYH	26.11%
63.0	IEP	34.82%	BHC	17.58%
63.0	CZR	34.76%	GBTC	16.83%
63.0	BHC	34.68%	MSTR	16.28%
63.0	GBTC	26.5%	SBNY	14.24%
63.0	CCL	25.8%	CCL	13.55%
63.0	CYH	23.45%	UAA	13.13%
63.0	SIVBQ	22.95%	X	12.39%
63.0	GT	22.53%	CTLT	12.36%
63.0	MSTR	22.19%	IEP	12.35%
63.0	NWL	21.45%	TSLA	12.15%
63.0	VNO	18.22%	GT	12.14%
63.0	LNC	17.86%	AA	11.64%
63.0	NVDA	17.3%	CZR	11.14%
63.0	MOS	16.17%	AMD	10.85%
63.0	AMD	15.81%	NVDA	10.74%
63.0	UAA	14.94%	SIVBQ	10.74%
63.0	FSUGY	14.67%	MOS	10.52%
63.0	MSFT	14.49%	CLF	10.42%
63.0	BXP	13.93%	VFC	10.34%
63.0	INTC	13.56%	ELAN	10.27%
63.0	X	13.39%	NWL	10.17%
63.0	VFC	13.29%	GNRC	10.01%
63.0	MU	11.97%	META	9.87%
63.0	AA	11.87%	VNO	9.83%
63.0	AMAT	11.54%	AAP	9.81%
63.0	T	11.35%	CMA	9.36%

All TMD: 126d

Results reflect ticker level average EUB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EUB" metric - positive performance within the expected 95%tile.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EUB-MAE_V	Ticker_S	EUB-MAE_S
126.0	AMC	320.05%	AMC	212.77%
126.0	LUMN	85.95%	LUMN	59.95%
126.0	CZR	69.94%	GME	44.03%
126.0	ELAN	64.51%	CYH	41.27%
126.0	BHC	53.72%	BHC	28.69%
126.0	TSLA	49.85%	MSTR	26.9%
126.0	CCL	43.35%	NWL	22.45%
126.0	NWL	38.74%	GBTC	22.13%
126.0	GBTC	37.32%	VFC	21.96%
126.0	GT	37.24%	CZR	21.64%
126.0	MSTR	36.53%	CCL	19.76%
126.0	CYH	35.66%	UAA	19.21%
126.0	IEP	33.11%	CLF	17.08%
126.0	NVDA	32.31%	GT	17.02%
126.0	LNC	31.69%	AA	16.82%
126.0	VNO	29.58%	THC	16.54%
126.0	BXP	25.93%	MOS	16.54%
126.0	UAA	24.26%	LNC	16.53%
126.0	VFC	23.24%	CTLT	16.25%
126.0	MOS	23.11%	AMD	15.78%
126.0	NFLX	22.27%	ETRN	15.56%
126.0	THC	21.5%	BIIB	15.37%
126.0	META	21.33%	ELAN	15.07%
126.0	GME	20.83%	TSLA	15.0%
126.0	X	20.06%	IEP	14.94%
126.0	CLF	19.74%	KALU	14.8%
126.0	ADBE	18.97%	VNO	14.45%
126.0	WYNN	18.96%	WRK	14.14%
126.0	INTC	18.95%	EXPE	13.82%
126.0	AMD	18.86%	NFLX	13.55%

All TMD: 252d

Results reflect ticker level average EUB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EUB" metric - positive performance within the expected 95%tile.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EUB-MAE_V	Ticker_S	EUB-MAE_S
252.0	LUMN	153.26%	AMC	147.84%
252.0	CZR	106.08%	CYH	84.19%
252.0	ELAN	105.27%	GBTC	58.97%
252.0	BHC	98.48%	BHC	56.23%
252.0	GBTC	97.82%	AAP	48.4%
252.0	NVDA	92.56%	MSTR	40.27%
252.0	CCL	85.05%	LUMN	38.19%
252.0	CYH	82.06%	CZR	36.03%
252.0	CDNS	77.82%	GME	34.26%
252.0	TSLA	76.19%	CLF	32.15%
252.0	INTU	71.0%	GT	28.93%
252.0	AMZN	68.27%	NFLX	28.58%
252.0	NWL	61.15%	UAA	27.75%
252.0	VNO	56.59%	META	26.97%
252.0	LNC	54.44%	TSLA	26.72%
252.0	AAP	50.39%	AA	26.06%
252.0	MSFT	48.53%	GNRC	25.54%
252.0	MS	48.51%	NWL	22.7%
252.0	ORLY	47.22%	OXY	22.43%
252.0	COST	47.19%	VFC	21.84%
252.0	AZO	46.79%	AMZN	21.5%
252.0	AMD	46.01%	X	20.98%
252.0	CMG	45.47%	VNO	20.9%
252.0	GT	44.39%	AVGO	20.58%
252.0	AMC	43.04%	AMD	20.54%
252.0	UAA	43.0%	NVDA	20.45%
252.0	DHI	42.51%	CCL	20.16%
252.0	CLF	41.03%	CTLT	20.02%
252.0	BBY	40.99%	WRK	19.59%
252.0	BXP	39.65%	DHI	19.5%

Bottom 30 Tickers By EUB MAE

All TMD: 1d

Results reflect ticker level average EUB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EUB" metric - positive performance within the expected 95%tile.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EUB-MAE_V	Ticker_S	EUB-MAE_S
1.0	MUB	0.15%	VCSH	0.07%
1.0	VCSH	0.17%	MUB	0.1%
1.0	LQD	0.29%	HYG	0.18%
1.0	FRA	0.34%	LQD	0.22%
1.0	HYG	0.36%	EMB	0.24%
1.0	GLD	0.41%	FRA	0.28%
1.0	PEP	0.42%	GLD	0.33%
1.0	MRK	0.48%	SPY	0.39%
1.0	NVS	0.49%	TLT	0.4%
1.0	MSI	0.51%	NVS	0.4%
1.0	HON	0.51%	PEP	0.41%
1.0	TMUS	0.52%	HON	0.45%
1.0	KHC	0.53%	MRK	0.45%
1.0	POST	0.53%	ABBV	0.47%
1.0	SNY	0.54%	TMUS	0.47%
1.0	GILD	0.55%	KHC	0.48%
1.0	HD	0.56%	POST	0.48%
1.0	BALL	0.58%	MSI	0.49%
1.0	AMGN	0.58%	VZ	0.49%
1.0	BUD	0.59%	AMGN	0.5%
1.0	TLT	0.6%	VICI	0.5%
1.0	ABBV	0.6%	BMY	0.51%
1.0	MNST	0.6%	GILD	0.51%
1.0	XOM	0.61%	AZO	0.52%
1.0	ORLY	0.61%	HSBC	0.52%
1.0	COST	0.61%	MNST	0.52%
1.0	VICI	0.62%	AZN	0.52%
1.0	SBUX	0.62%	COST	0.52%
1.0	SLV	0.62%	ORLY	0.52%
1.0	AZN	0.62%	CSCO	0.52%

All TMD: 10d

Results reflect ticker level average EUB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EUB" metric - positive performance within the expected 95%tile.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EUB-MAE_V	Ticker_S	EUB-MAE_S
10.0	VCSH	0.43%	VCSH	0.24%
10.0	MUB	0.56%	MUB	0.33%
10.0	LQD	0.82%	HYG	0.63%
10.0	FRA	0.91%	LQD	0.75%
10.0	HYG	1.06%	EMB	0.83%
10.0	PEP	1.21%	FRA	0.88%
10.0	GLD	1.21%	SPY	1.11%
10.0	POST	1.48%	GLD	1.18%
10.0	NVS	1.48%	PEP	1.21%
10.0	SNY	1.53%	TLT	1.38%
10.0	GILD	1.53%	NVS	1.43%
10.0	HD	1.56%	MRK	1.43%
10.0	MSI	1.58%	HON	1.47%
10.0	TLT	1.59%	POST	1.49%
10.0	MRK	1.59%	VZ	1.54%
10.0	HON	1.59%	BMY	1.56%
10.0	SPY	1.63%	QQQ	1.57%
10.0	XOM	1.66%	CSCO	1.57%
10.0	AMGN	1.67%	ACGL	1.58%
10.0	BALL	1.67%	TMUS	1.58%
10.0	ZTS	1.67%	ORLY	1.59%
10.0	VICI	1.68%	UNH	1.59%
10.0	HCA	1.68%	AMGN	1.62%
10.0	ACGL	1.7%	ABBV	1.62%
10.0	TMUS	1.72%	VICI	1.66%
10.0	ABBV	1.73%	GILD	1.66%
10.0	BUD	1.78%	CAH	1.69%
10.0	ORLY	1.81%	MSI	1.7%
10.0	IRM	1.82%	KHC	1.7%
10.0	TRGP	1.83%	CPRT	1.7%

All TMD: 21d

Results reflect ticker level average EUB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EUB" metric - positive performance within the expected 95%tile.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EUB-MAE_V	Ticker_S	EUB-MAE_S
21.0	VCSH	0.64%	VCSH	0.36%
21.0	MUB	0.79%	MUB	0.42%
21.0	LQD	1.21%	HYG	0.88%
21.0	FRA	1.38%	LQD	0.99%
21.0	PEP	1.66%	EMB	1.13%
21.0	HYG	1.81%	FRA	1.35%
21.0	GLD	1.98%	GLD	1.48%
21.0	NVS	2.06%	SPY	1.58%
21.0	MSI	2.3%	PEP	1.68%
21.0	GILD	2.31%	TLT	1.95%
21.0	BUD	2.34%	NVS	1.95%
21.0	HD	2.35%	HSBC	2.17%
21.0	POST	2.4%	HON	2.17%
21.0	ACGL	2.44%	BMY	2.24%
21.0	SPY	2.46%	QQQ	2.25%
21.0	SNY	2.48%	TMUS	2.29%
21.0	HSBC	2.5%	MRK	2.32%
21.0	HON	2.5%	VZ	2.33%
21.0	XOM	2.52%	MSI	2.33%
21.0	TLT	2.57%	CAH	2.35%
21.0	MRK	2.58%	GILD	2.37%
21.0	NAVI	2.58%	POST	2.4%
21.0	KHC	2.64%	KHC	2.41%
21.0	CMCSA	2.65%	ACGL	2.41%
21.0	ZTS	2.66%	PCG	2.42%
21.0	VICI	2.68%	ABBV	2.44%
21.0	TMUS	2.69%	CSCO	2.44%
21.0	BAC	2.74%	UNH	2.46%
21.0	VZ	2.77%	AMGN	2.56%
21.0	FRCB	2.77%	ORLY	2.56%

All TMD: 63d

Results reflect ticker level average EUB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EUB" metric - positive performance within the expected 95%tile.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EUB-MAE_V	Ticker_S	EUB-MAE_S
63.0	VCSH	1.2%	VCSH	0.72%
63.0	MUB	1.25%	MUB	0.76%
63.0	LQD	2.13%	HYG	1.67%
63.0	FRA	2.51%	LQD	1.99%
63.0	PEP	2.79%	FRA	2.14%
63.0	GLD	3.12%	EMB	2.34%
63.0	BUD	3.9%	GLD	2.53%
63.0	HYG	4.02%	PEP	2.7%
63.0	JAZZ	4.28%	SPY	2.74%
63.0	ZTS	4.29%	COST	3.4%
63.0	CAH	4.3%	TLT	3.52%
63.0	SNY	4.32%	MRK	3.67%
63.0	MSI	4.32%	HON	3.74%
63.0	VZ	4.35%	NVS	3.75%
63.0	TMUS	4.36%	VZ	3.79%
63.0	POST	4.41%	VICI	4.12%
63.0	IRM	4.41%	AZO	4.16%
63.0	NVS	4.45%	AMGN	4.29%
63.0	TLT	4.49%	QQQ	4.32%
63.0	ACGL	4.54%	ORLY	4.36%
63.0	CMCSA	4.55%	POST	4.37%
63.0	ORLY	4.57%	JPM	4.43%
63.0	AMGN	4.59%	TMUS	4.43%
63.0	HD	4.66%	ACGL	4.44%
63.0	HON	4.67%	ZTS	4.45%
63.0	GILD	4.71%	MSI	4.48%
63.0	CHTR	4.72%	MNST	4.48%
63.0	XOM	4.76%	UNH	4.49%
63.0	MRK	4.78%	HD	4.51%
63.0	BMY	4.85%	GILD	4.57%

All TMD: 126d

Results reflect ticker level average EUB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EUB" metric - positive performance within the expected 95%tile.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EUB-MAE_V	Ticker_S	EUB-MAE_S
126.0	VCSH	1.17%	VCSH	0.83%
126.0	MUB	1.58%	MUB	1.29%
126.0	LQD	1.95%	HYG	1.9%
126.0	FRA	3.44%	LQD	2.11%
126.0	PEP	3.73%	EMB	2.62%
126.0	ABBV	5.11%	FRA	3.06%
126.0	SPY	5.32%	PEP	3.81%
126.0	TMUS	5.32%	MNST	4.15%
126.0	ZTS	5.33%	GLD	4.25%
126.0	AMGN	5.36%	SPY	4.59%
126.0	GLD	5.48%	ABBV	4.62%
126.0	NVS	5.53%	BUD	4.8%
126.0	NAVI	5.54%	AMGN	4.8%
126.0	MNST	5.57%	HON	4.87%
126.0	IRM	5.62%	TLT	4.91%
126.0	BALL	5.78%	NVS	5.24%
126.0	XOM	6.22%	AZO	5.28%
126.0	BUD	6.26%	UNH	5.36%
126.0	VICI	6.31%	KHC	5.37%
126.0	SNY	6.43%	CVS	5.38%
126.0	POST	6.44%	ORLY	5.7%
126.0	CAH	6.46%	TMUS	5.76%
126.0	JAZZ	6.53%	VICI	5.78%
126.0	ORLY	6.55%	QQQ	5.84%
126.0	BMY	6.79%	SNY	5.96%
126.0	HLT	6.88%	CSCO	6.0%
126.0	MSI	6.94%	ZTS	6.01%
126.0	CNC	7.05%	VZ	6.13%
126.0	TFC	7.12%	XOM	6.15%
126.0	HYG	7.42%	BMY	6.16%

All TMD: 252d

Results reflect ticker level average EUB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EUB" metric - positive performance within the expected 95%tile.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EUB-MAE_V	Ticker_S	EUB-MAE_S
252.0	VCSH	1.97%	VCSH	1.15%
252.0	MUB	3.18%	MUB	1.57%
252.0	LQD	4.55%	HYG	3.59%
252.0	NVS	5.29%	FRA	4.19%
252.0	FRA	5.46%	BMY	4.29%
252.0	PEP	6.09%	LQD	4.4%
252.0	CVS	6.84%	EMB	4.8%
252.0	BUD	6.89%	PEP	5.0%
252.0	CHTR	7.76%	GLD	5.2%
252.0	GLD	7.93%	NVS	6.11%
252.0	ZTS	8.0%	VICI	6.39%
252.0	MRK	8.22%	AZN	6.94%
252.0	GILD	8.63%	TLT	7.16%
252.0	POST	8.76%	AMGN	7.3%
252.0	CMCSA	8.92%	AZO	7.46%
252.0	VICI	9.39%	HON	7.83%
252.0	SLV	9.6%	ABBV	7.89%
252.0	IRM	9.61%	HSBC	7.92%
252.0	MSI	9.63%	GSK	7.97%
252.0	BALL	9.79%	MRK	7.98%
252.0	XOM	10.11%	CSCO	8.04%
252.0	HYG	10.17%	SPY	8.05%
252.0	AMGN	10.74%	MNST	8.32%
252.0	CSTM	10.81%	VZ	8.32%
252.0	SNY	10.85%	TMUS	8.36%
252.0	EMB	10.93%	BIIB	8.67%
252.0	NAVI	11.02%	HD	8.74%
252.0	BMY	11.09%	UNH	8.85%
252.0	LW	11.19%	ZTS	9.0%
252.0	GNRC	11.31%	MSI	9.09%

Performance Summary - Returns on EUB based exposures (ROEUB)

Here we compare ROEUB, or price return performance of ticker-model date (TMD) exposures based upon EUB, for Vector Mdel EUB to the Sigma Model's EUB ("S", presented with light shading).

Vector Model EUB is denoted by a "V" and presented with dark shading in the bar charts comparison of EUB that follow, whereas Sigma EUB is denoted by "S" and presented with light shading.

Sigma based ticker exposure performance reflects equal TMD weighting and the price returns of the underlying TMD for the given horizon.

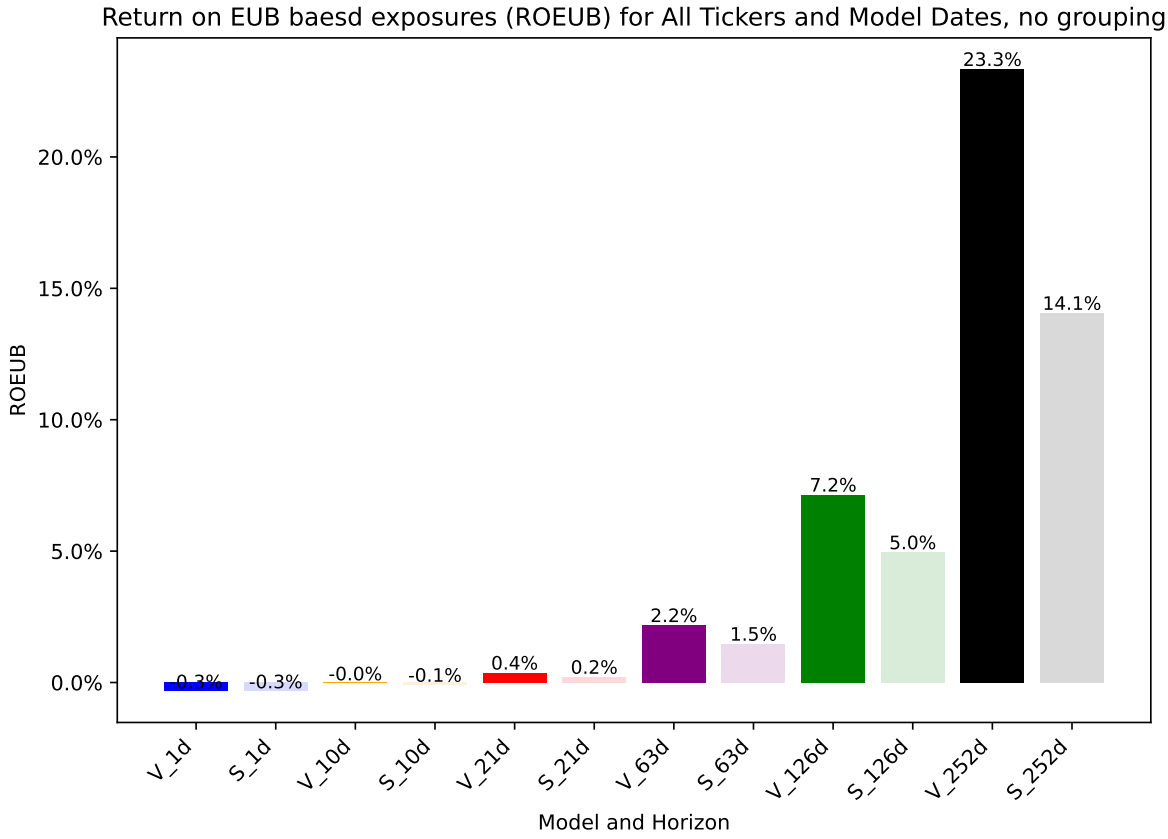
Vector Model based TMD exposures reflect each TMD's underlying horizon price return multiplied by the ratio of Vector Model EUB to Sigma model based EUB for the given horizon. This ratio is capped of 3.0x and floored of 0.333x.

Following each bar chart comparison of ROEUB is a table detailing the alpha (intercept) and slope (beta) of Vector Model EUB based exposure performance to Sigma EUB exposure based performance. The beta arguably provides some indication of the leverage of the Vector Model based exposures and the alpha is an indication of Vector Model EUB's ability to generate performance indepdendent of the ticker's returns. See the Introduction for further discussion of alpha and beta.

Note that time horizons are denominated in trading days, where 10d is ~ 2 weeks in calendar terms, 21d is ~ 1 month, 63d is ~ 1 quarter, 126d is ~ half year, 252d is ~1 year. Model estimates for all horizons are made on each Model Date, so p-Values for horizons beyond 1d are not valid.

All Out of Sample Model Dates

Period examined: All model dates from 2022-01-31 through 2025-03-28



Alpha (intercept) and Beta (slope) of Vector Model ROEUB regressed upon corresponding horizon actual ticker-model date returns:

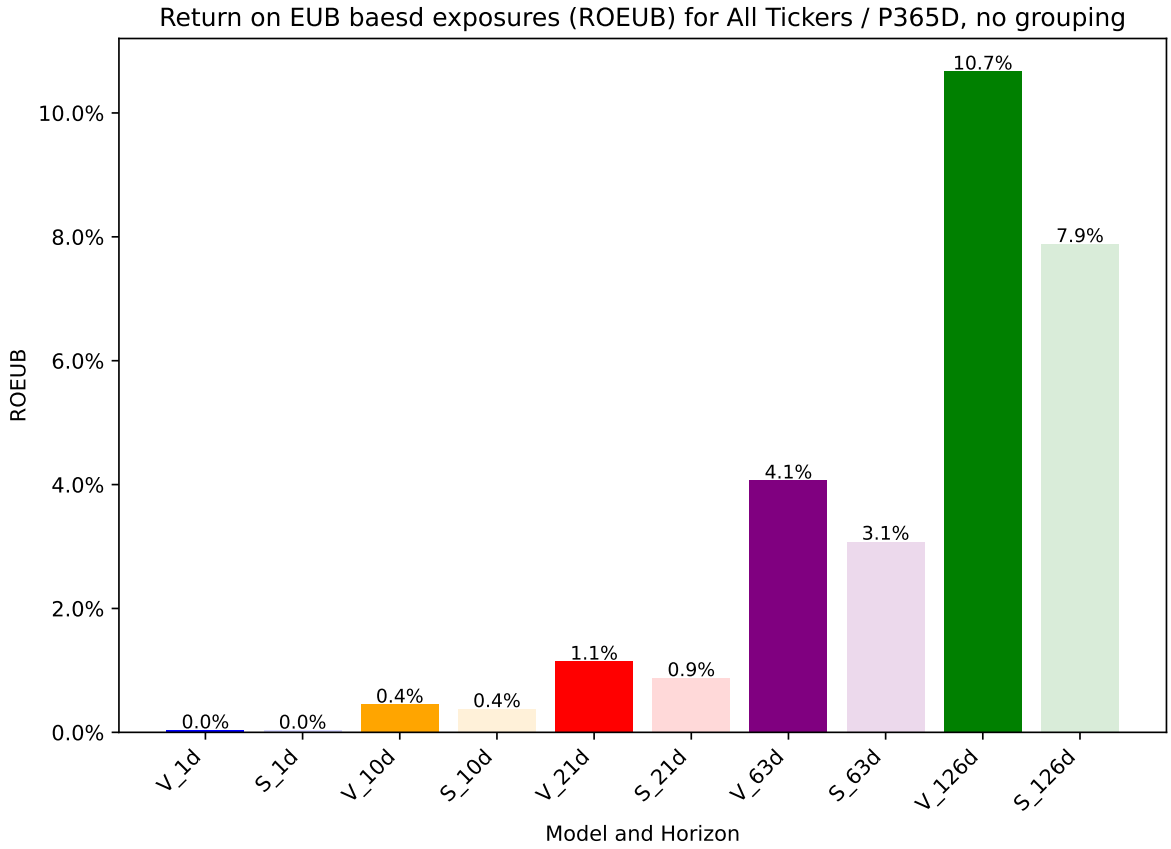
	1d	10d	21d	63d	126d	252d
intercept	-0.00%	0.05%	0.16%	0.44%	0.98%	3.58%
intercept_p_value	94.44%	0.31%	0.00%	0.00%	0.00%	0.00%
slope	99.96%	94.73%	101.52%	118.47%	124.38%	140.53%
slope_p_value	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Same as above, but averaged by Ticker across Model Dates:

	1d	10d	21d	63d	126d	252d
intercept	0.00%	0.03%	0.08%	-0.05%	-0.73%	-2.98%
intercept_p_value	46.90%	26.28%	16.13%	5.90%	9.90%	10.68%
slope	101.34%	100.37%	106.91%	120.41%	129.50%	150.60%
slope_p_value	0.00%	0.00%	0.00%	0.00%	0.00%	0.36%

Prior 365 Calendar Days (P365D)

Period examined: All model dates from 2024-04-02 through 2025-03-28



Alpha (intercept) and Beta (slope) of Vector Model ROEUB regressed upon corresponding horizon actual ticker-model date returns:

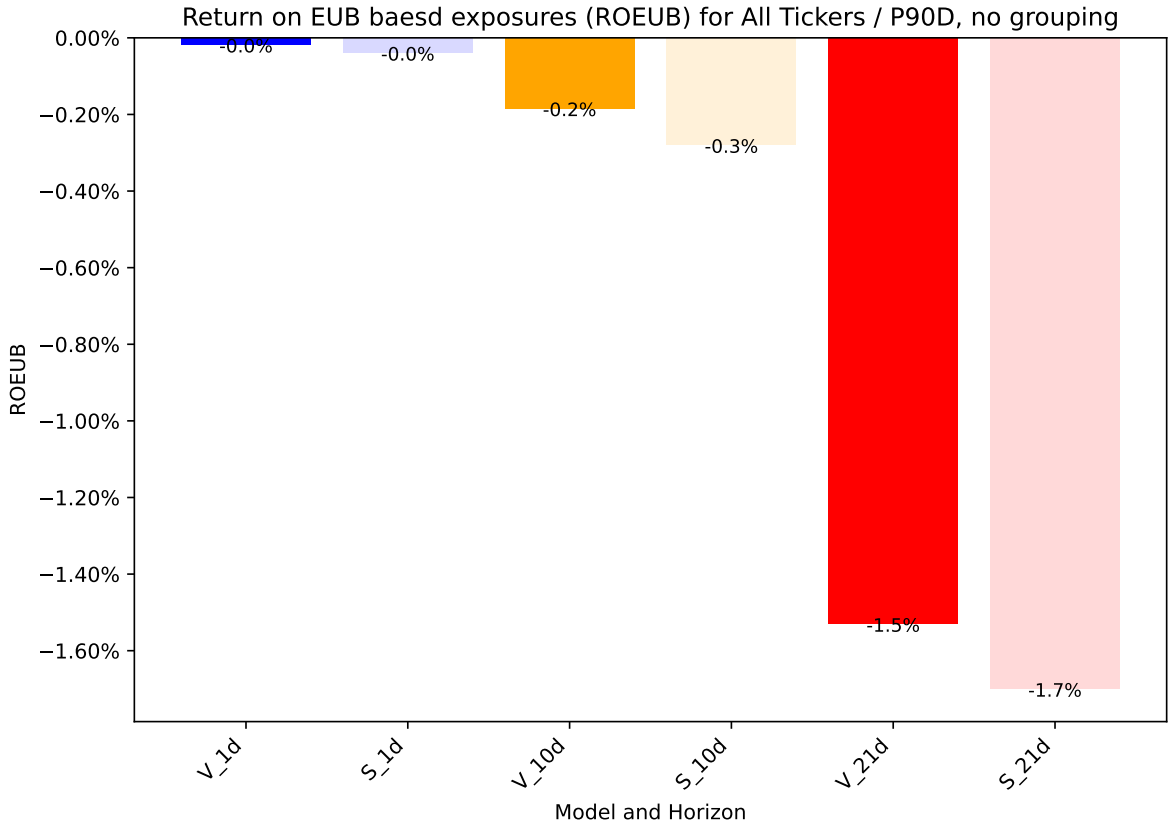
	1d	10d	21d	63d	126d
intercept	0.00%	0.06%	0.20%	0.08%	-0.13%
intercept_p_value	78.40%	1.46%	0.00%	24.67%	31.67%
slope	104.96%	102.75%	107.83%	129.52%	136.95%
slope_p_value	0.00%	0.00%	0.00%	0.00%	0.00%

Same as above, but averaged by Ticker across Model Dates:

	1d	10d	21d	63d	126d
intercept	0.01%	0.08%	0.24%	0.42%	-0.61%
intercept_p_value	48.19%	21.93%	16.64%	15.27%	19.38%
slope	106.44%	106.60%	113.02%	126.02%	138.39%
slope_p_value	0.00%	0.00%	0.00%	0.01%	0.00%

Prior 90 Calendar Days (P90D)

Period examined: All model dates from 2025-01-02 through 2025-03-28



Alpha (intercept) and Beta (slope) of Vector Model ROEUB regressed upon corresponding horizon actual ticker-model date returns:

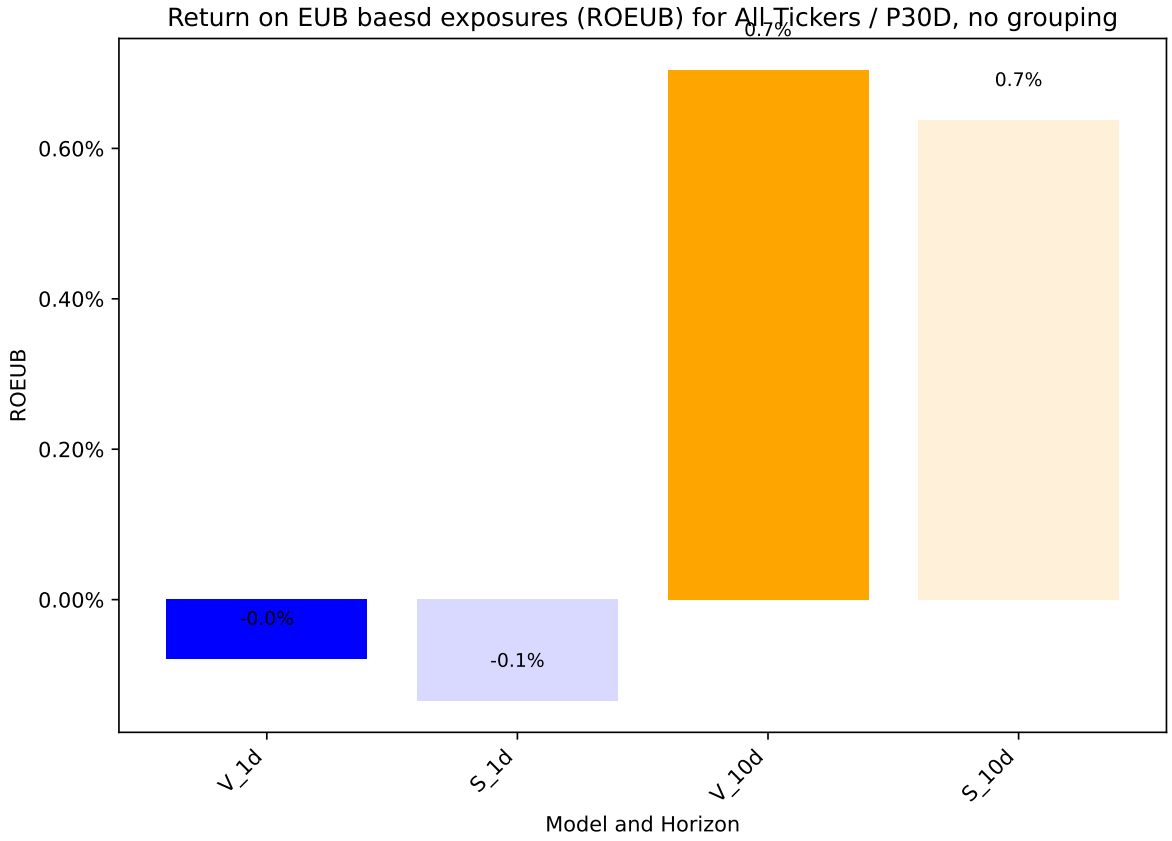
	1d	10d	21d
intercept	0.02%	0.08%	0.17%
intercept_p_value	18.88%	5.35%	0.49%
slope	99.42%	93.17%	100.01%
slope_p_value	0.00%	0.00%	0.00%

Same as above, but averaged by Ticker across Model Dates:

	1d	10d	21d
intercept	0.02%	0.06%	0.21%
intercept_p_value	48.55%	31.25%	30.36%
slope	105.48%	101.89%	110.62%
slope_p_value	0.00%	0.00%	0.01%

Prior 30 Calendar Days (P30D)

Period examined: All model dates from 2025-03-03 through 2025-03-28



Alpha (intercept) and Beta (slope) of Vector Model ROEUB regressed upon corresponding horizon actual ticker-model date returns:

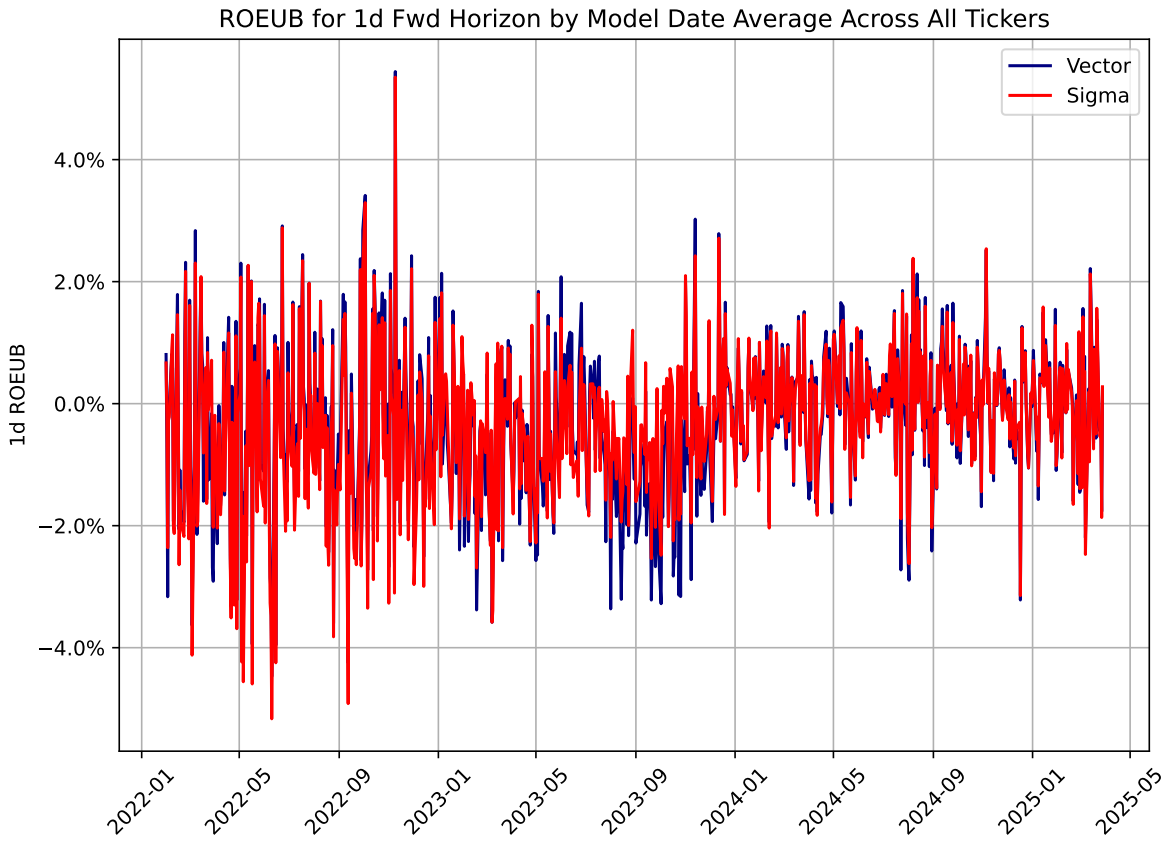
	1d	10d
intercept	0.05%	0.10%
intercept_p_value	6.29%	18.63%
slope	93.86%	94.50%
slope_p_value	0.00%	0.00%

Same as above, but averaged by Ticker across Model Dates:

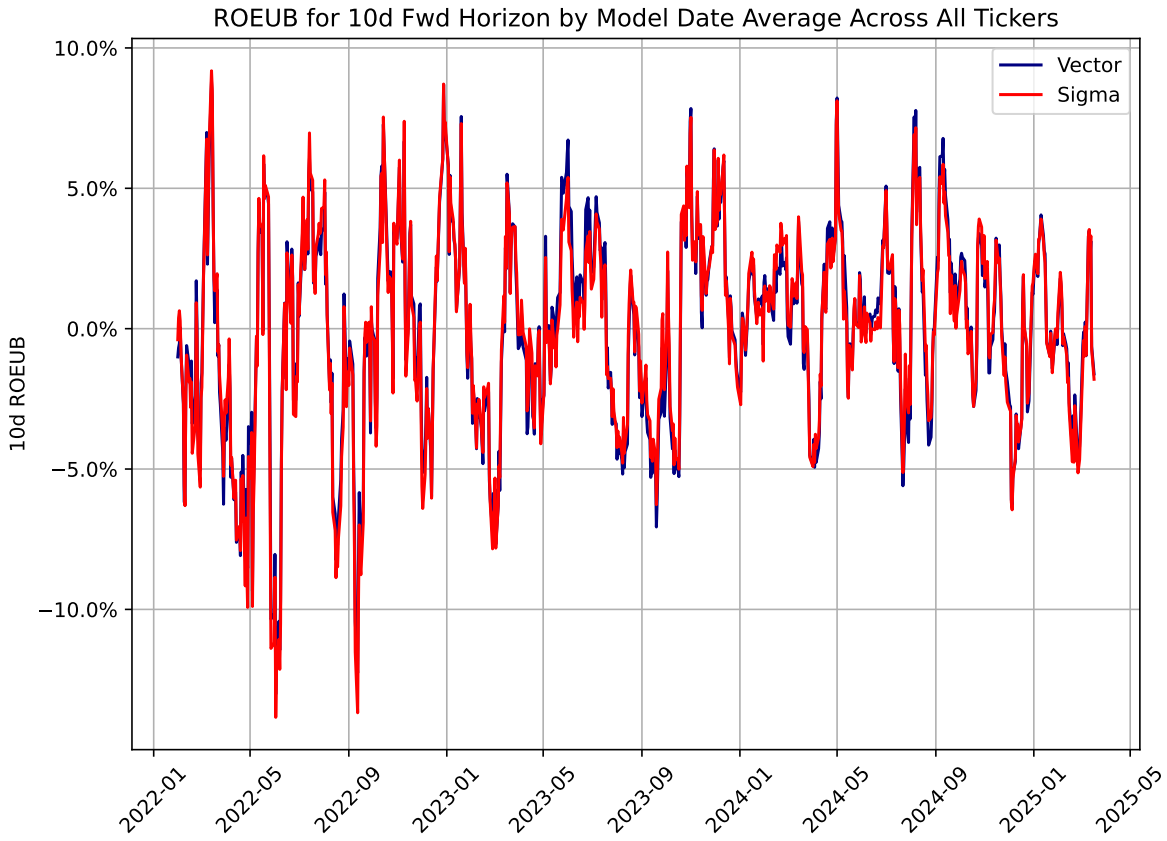
	1d	10d
intercept	0.05%	0.05%
intercept_p_value	47.34%	42.32%
slope	101.41%	99.90%
slope_p_value	0.00%	0.01%

ROEUB by Model Date Detail

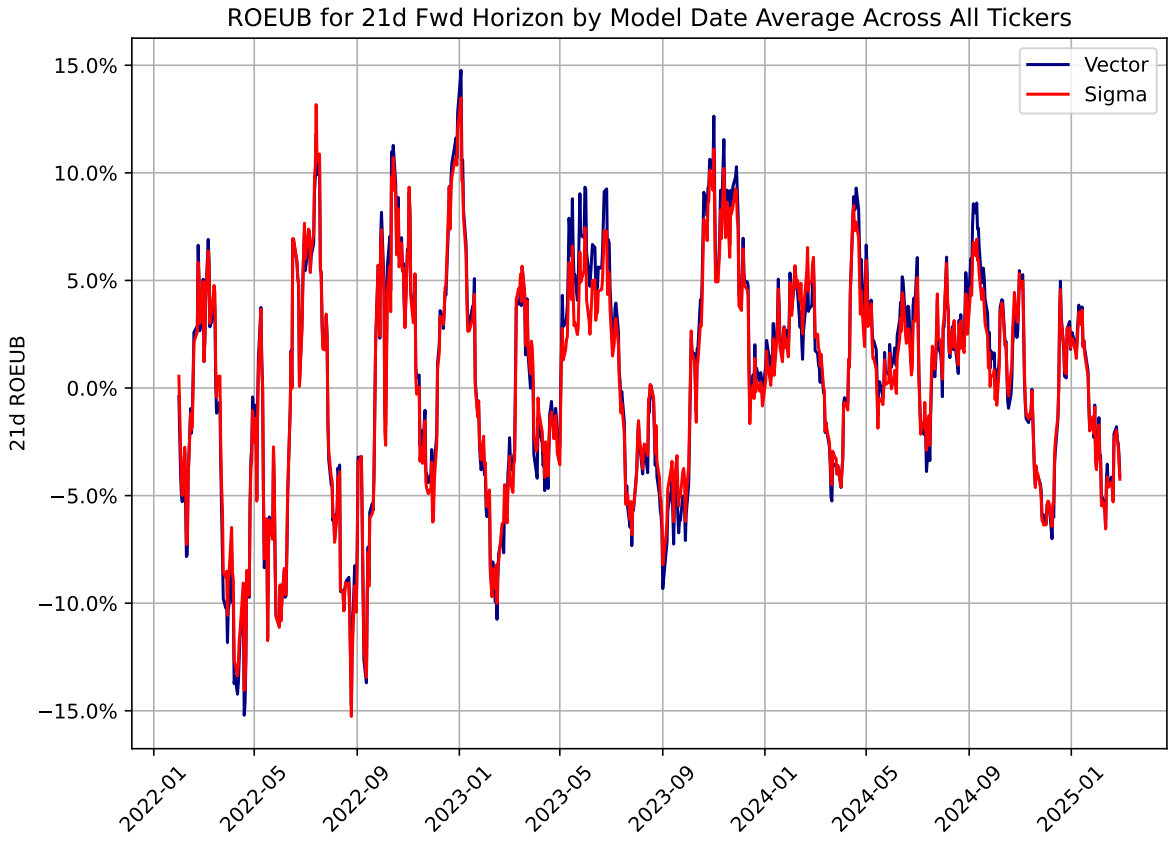
1d Horizon



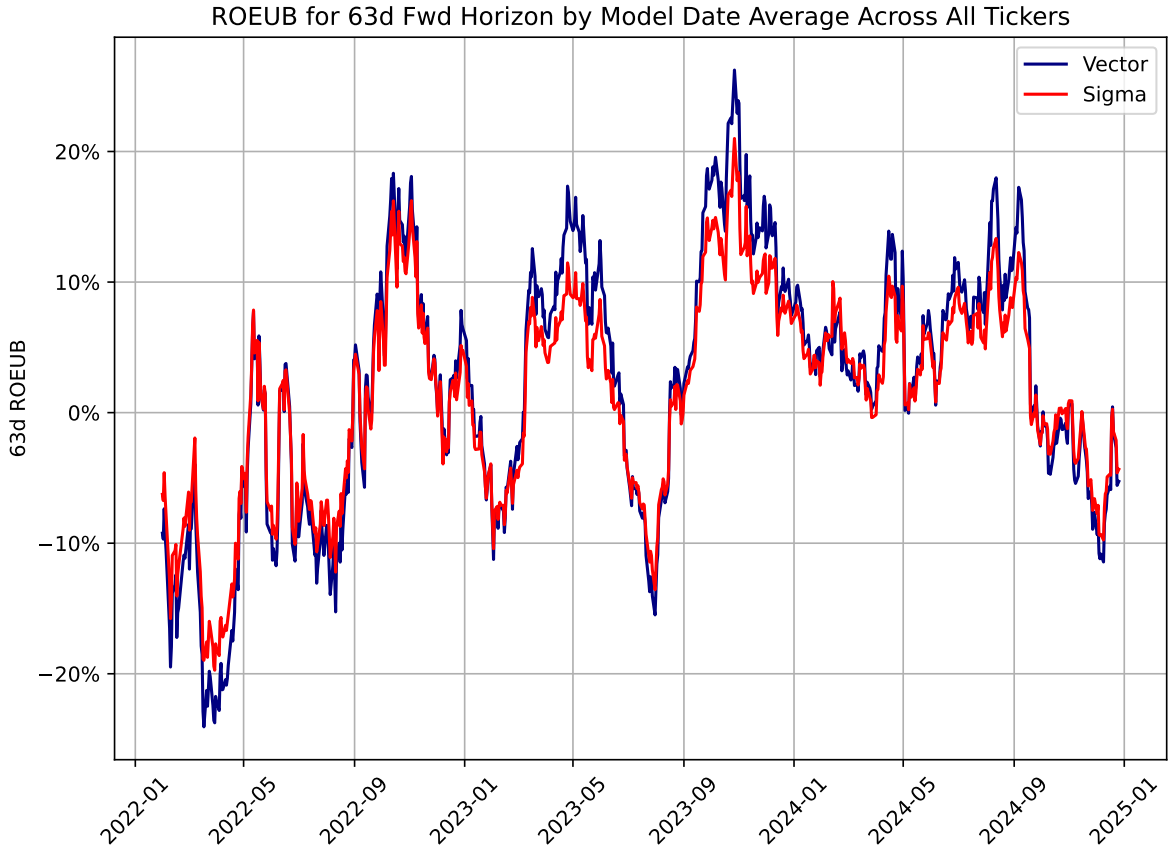
10d Horizon


ROEUB for 10d Fwd Horizon by Model Date Average Across All Tickers
10d ROEUB
10.0%
5.0%
0.0%
−5.0%
−10.0%
Vector
Sigma
2022-01
2022-05
2022-09
2023-01
2023-05
2023-09
2024-01
2024-05
2024-09
2025-01
2025-05

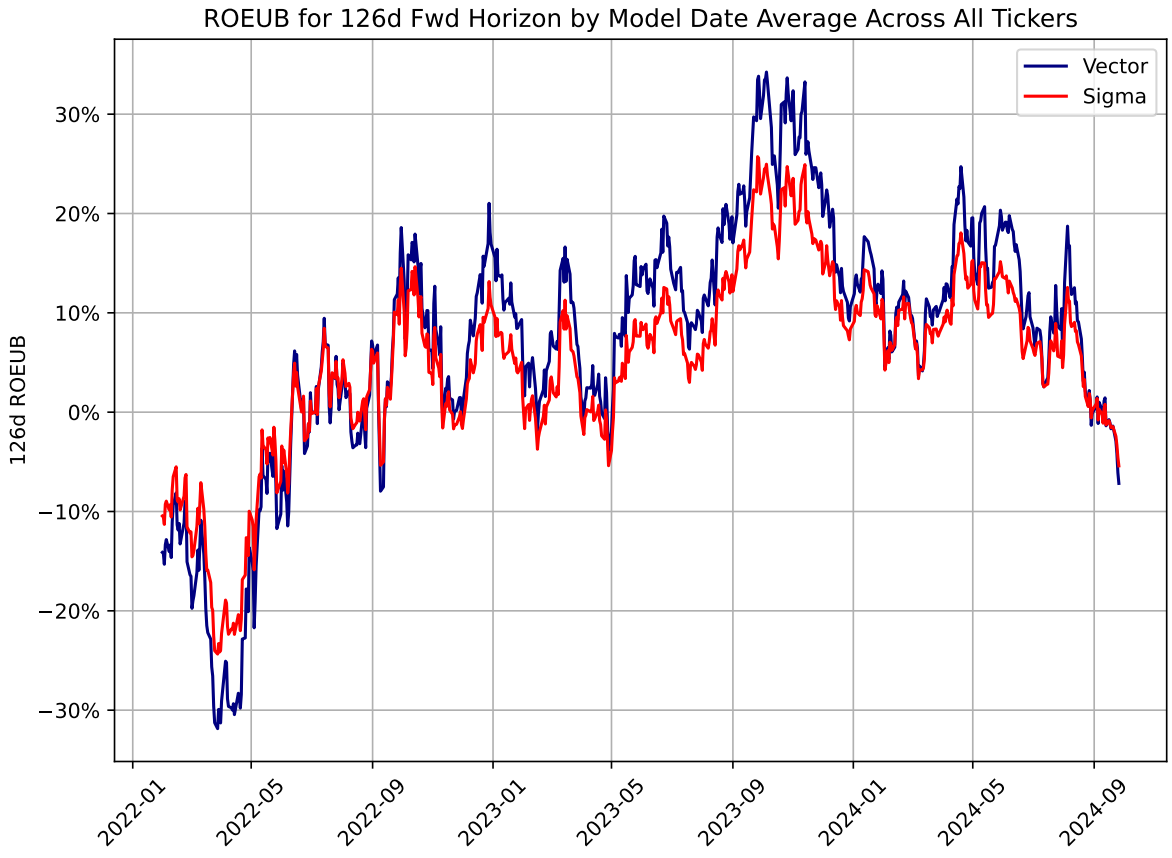
21d Horizon


ROEUB for 21d Fwd Horizon by Model Date Average Across All Tickers
Vector
Sigma
21d ROEUB
15.0%
10.0%
5.0%
0.0%
−5.0%
−10.0%
−15.0%
2022-01
2022-05
2022-09
2023-01
2023-05
2023-09
2024-01
2024-05
2024-09
2025-01

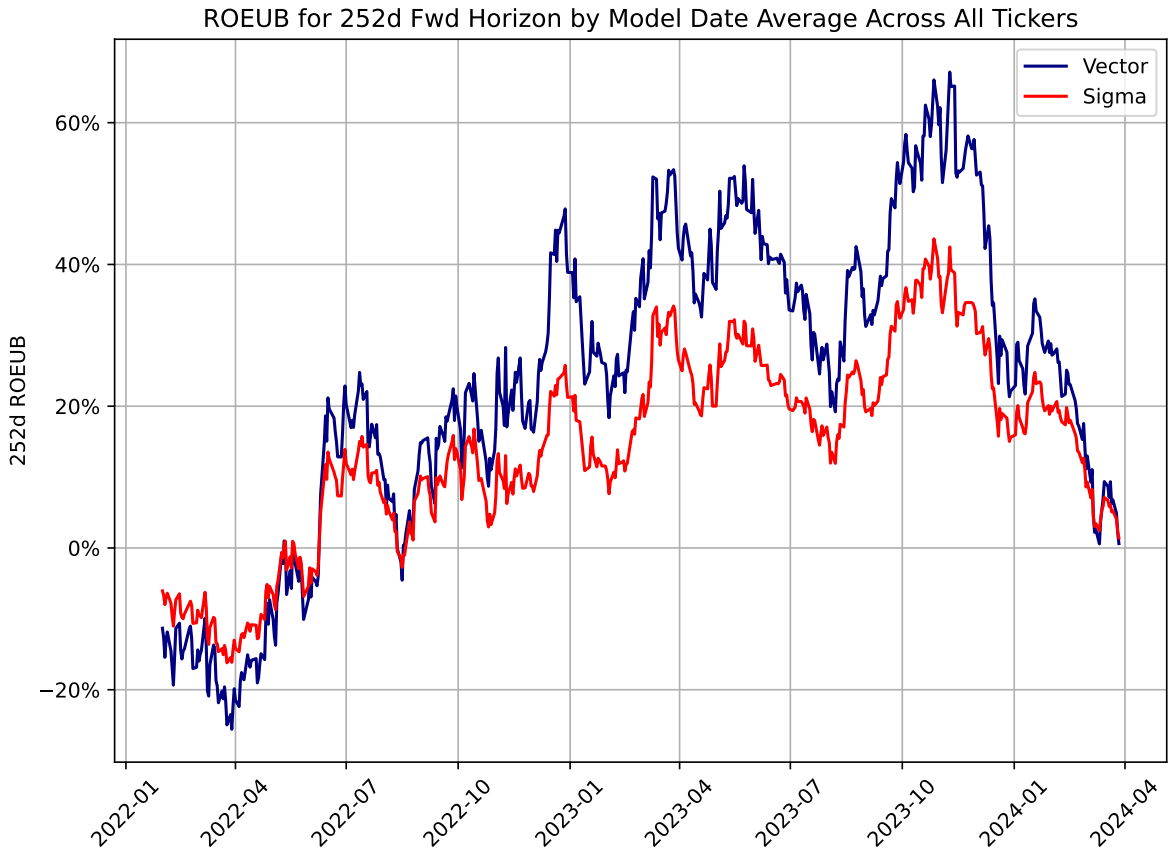
63d Horizon


ROEUB for 63d Fwd Horizon by Model Date Average Across All Tickers
Vector
Sigma
63d ROEUB
20%
10%
0%
−10%
−20%
2022-01
2022-05
2022-09
2023-01
2023-05
2023-09
2024-01
2024-05
2024-09
2025-01

126d Horizon



252d Horizon



Top 30 Tickers By ROEUB

All TMD: 1d

Results reflect ticker level average ROEUB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEUB_V	Ticker_S	ROEUB_S
1.0	TSLA	0.34%	MSTR	0.45%
1.0	GBTC	0.27%	VST	0.26%
1.0	CCL	0.26%	NVDA	0.25%
1.0	LLY	0.25%	GBTC	0.2%
1.0	NVDA	0.24%	GME	0.2%
1.0	X	0.22%	TRGP	0.17%
1.0	GE	0.21%	LLY	0.17%
1.0	MSTR	0.2%	GE	0.15%
1.0	VST	0.2%	NFLX	0.14%
1.0	TRGP	0.18%	X	0.14%
1.0	PHM	0.14%	PWR	0.14%
1.0	MSFT	0.14%	CAH	0.13%
1.0	VNO	0.14%	TMUS	0.12%
1.0	PWR	0.14%	META	0.12%
1.0	THC	0.13%	THC	0.12%
1.0	AMC	0.13%	ETRN	0.12%
1.0	TDG	0.13%	TDG	0.12%
1.0	CMG	0.12%	TEVA	0.11%
1.0	GME	0.11%	ORLY	0.11%
1.0	COST	0.1%	PHM	0.11%
1.0	CAH	0.1%	ACGL	0.11%
1.0	ORLY	0.1%	GWW	0.1%
1.0	GOLD	0.1%	IRM	0.1%
1.0	IRM	0.09%	AZO	0.09%
1.0	CDNS	0.09%	ISRG	0.09%
1.0	ETRN	0.09%	ORCL	0.09%
1.0	ON	0.09%	COST	0.09%
1.0	DHI	0.09%	MSI	0.09%
1.0	JPM	0.09%	CDNS	0.09%
1.0	HLT	0.09%	CMG	0.09%

All TMD: 10d

Results reflect ticker level average ROEUB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEUB_V	Ticker_S	ROEUB_S
10.0	NVDA	3.78%	MSTR	4.75%
10.0	TSLA	3.69%	VST	2.71%
10.0	MSTR	2.86%	NVDA	2.56%
10.0	VST	2.52%	GBTC	1.94%
10.0	CCL	2.43%	GME	1.77%
10.0	GBTC	2.38%	LLY	1.77%
10.0	LLY	2.37%	TRGP	1.71%
10.0	GE	1.68%	NFLX	1.55%
10.0	MSFT	1.45%	META	1.5%
10.0	PWR	1.44%	GE	1.46%
10.0	GME	1.38%	PWR	1.41%
10.0	ETRN	1.32%	ETRN	1.41%
10.0	TRGP	1.32%	X	1.34%
10.0	CAH	1.25%	CAH	1.32%
10.0	X	1.23%	TEVA	1.26%
10.0	AZO	1.21%	TDG	1.13%
10.0	TDG	1.21%	PHM	1.12%
10.0	CDNS	1.14%	TMUS	1.09%
10.0	CMG	1.08%	ORLY	1.05%
10.0	JPM	1.06%	THC	1.05%
10.0	ORLY	1.05%	GWW	1.04%
10.0	GS	1.03%	IRM	1.02%
10.0	PHM	1.03%	ACGL	0.99%
10.0	TMUS	1.02%	ORCL	0.98%
10.0	QQQ	0.99%	CDNS	0.93%
10.0	THC	0.96%	ISRG	0.92%
10.0	ACGL	0.93%	AZO	0.89%
10.0	HLT	0.92%	MSI	0.88%
10.0	DHI	0.91%	COST	0.86%
10.0	CPRT	0.84%	CMG	0.83%

All TMD: 21d

Results reflect ticker level average ROEUB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEUB_V	Ticker_S	ROEUB_S
21.0	NVDA	9.01%	MSTR	10.55%
21.0	TSLA	8.87%	VST	5.82%
21.0	MSTR	7.42%	NVDA	5.59%
21.0	CCL	6.09%	GBTC	4.28%
21.0	GBTC	6.05%	LLY	3.79%
21.0	VST	5.93%	ETRN	3.5%
21.0	LLY	4.91%	TRGP	3.49%
21.0	ETRN	3.92%	META	3.47%
21.0	GE	3.8%	NFLX	3.41%
21.0	PWR	3.7%	GE	3.17%
21.0	AZO	3.45%	PWR	2.92%
21.0	TRGP	2.92%	TEVA	2.74%
21.0	CAH	2.91%	GME	2.74%
21.0	MSFT	2.85%	CAH	2.72%
21.0	DHI	2.84%	X	2.63%
21.0	ORLY	2.74%	PHM	2.47%
21.0	TDG	2.74%	TDG	2.33%
21.0	PHM	2.73%	GWW	2.28%
21.0	X	2.67%	TMUS	2.26%
21.0	CDNS	2.62%	ORCL	2.22%
21.0	JPM	2.41%	ORLY	2.17%
21.0	COST	2.36%	THC	2.14%
21.0	CMG	2.3%	IRM	2.14%
21.0	GS	2.18%	ACGL	2.09%
21.0	HLT	2.15%	ISRG	2.08%
21.0	QQQ	2.1%	COST	1.94%
21.0	ACGL	2.09%	MSI	1.93%
21.0	TMUS	2.08%	AZO	1.91%
21.0	CPRT	2.02%	CDNS	1.85%
21.0	GWW	1.98%	CMG	1.83%

All TMD: 63d

Results reflect ticker level average ROEUB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEUB_V	Ticker_S	ROEUB_S
63.0	MSTR	35.56%	MSTR	31.95%
63.0	NVDA	33.16%	VST	20.7%
63.0	VST	21.96%	NVDA	20.09%
63.0	GBTC	21.05%	GBTC	15.67%
63.0	CCL	20.26%	META	13.09%
63.0	TSLA	18.52%	NFLX	12.09%
63.0	GE	14.92%	LLY	11.01%
63.0	DHI	14.13%	ETRN	10.28%
63.0	LLY	14.06%	GE	10.25%
63.0	PWR	12.96%	TRGP	10.25%
63.0	PHM	11.02%	PHM	9.13%
63.0	TRGP	10.5%	PWR	8.85%
63.0	AZO	10.32%	TEVA	8.1%
63.0	ETRN	9.47%	CAH	7.85%
63.0	MSFT	9.44%	ISRG	7.37%
63.0	NFLX	9.24%	ORCL	7.32%
63.0	TDG	9.23%	THC	7.22%
63.0	CAH	9.09%	GWW	7.14%
63.0	ORLY	8.94%	TDG	7.13%
63.0	COST	8.86%	ACGL	6.64%
63.0	QQQ	8.79%	IRM	6.62%
63.0	ACGL	8.52%	CCL	6.59%
63.0	CMG	8.49%	CMG	6.45%
63.0	CPRT	8.39%	MSI	6.35%
63.0	VNO	8.32%	TMUS	6.17%
63.0	GWW	8.27%	DHI	6.17%
63.0	CDNS	8.15%	CDNS	6.09%
63.0	AMAT	8.14%	ORLY	6.06%
63.0	JPM	8.08%	CPRT	5.94%
63.0	ISRG	8.03%	JPM	5.91%

All TMD: 126d

Results reflect ticker level average ROEUB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEUB_V	Ticker_S	ROEUB_S
126.0	NVDA	83.97%	MSTR	77.77%
126.0	MSTR	68.75%	NVDA	54.68%
126.0	GBTC	58.74%	VST	47.38%
126.0	VST	55.34%	GBTC	42.11%
126.0	CCL	39.93%	META	32.04%
126.0	TSLA	37.99%	NFLX	29.34%
126.0	NFLX	37.7%	GE	25.37%
126.0	GE	37.35%	LLY	23.64%
126.0	DHI	34.14%	PHM	23.12%
126.0	PHM	33.97%	TRGP	22.8%
126.0	LLY	27.38%	THC	20.73%
126.0	AMZN	26.62%	PWR	19.92%
126.0	AMAT	25.89%	ETRN	18.49%
126.0	PWR	25.78%	TEVA	18.25%
126.0	VNO	25.75%	ORCL	18.19%
126.0	ISRG	25.68%	ISRG	17.49%
126.0	COST	25.32%	TDG	17.12%
126.0	MU	25.11%	IRM	17.0%
126.0	AMD	24.92%	GWW	16.92%
126.0	THC	24.44%	CAH	16.65%
126.0	QQQ	24.12%	ACGL	16.29%
126.0	ORCL	23.73%	DHI	15.89%
126.0	AZO	22.66%	CCL	15.64%
126.0	MSFT	22.2%	CMG	15.63%
126.0	PCG	22.11%	MSI	15.37%
126.0	TRGP	22.09%	CPRT	13.96%
126.0	TDG	21.78%	LEN	13.79%
126.0	CPRT	21.53%	JPM	13.63%
126.0	ORLY	21.1%	CDNS	13.42%
126.0	JPM	20.66%	ORLY	13.29%

All TMD: 252d

Results reflect ticker level average ROEUB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEUB_V	Ticker_S	ROEUB_S
252.0	NVDA	315.96%	MSTR	234.65%
252.0	MSTR	216.39%	NVDA	160.57%
252.0	GBTC	212.35%	VST	132.14%
252.0	NFLX	129.16%	GBTC	130.26%
252.0	GE	117.95%	META	87.32%
252.0	VST	116.41%	NFLX	67.11%
252.0	PHM	106.15%	PHM	64.12%
252.0	LLY	106.14%	GE	64.03%
252.0	PWR	104.87%	LLY	61.15%
252.0	DHI	102.31%	THC	55.1%
252.0	CDNS	95.67%	TRGP	51.05%
252.0	AMZN	95.59%	PWR	44.54%
252.0	CCL	92.97%	TDG	44.22%
252.0	META	89.6%	TEVA	42.93%
252.0	LEN	83.07%	DHI	41.12%
252.0	COST	79.12%	ISRG	40.56%
252.0	ISRG	76.24%	IRM	39.77%
252.0	AMAT	74.74%	ACGL	39.18%
252.0	QQQ	72.62%	ORCL	38.97%
252.0	THC	71.1%	CMG	38.53%
252.0	AMD	71.0%	GWW	37.17%
252.0	MSFT	70.85%	LEN	37.05%
252.0	ACGL	70.19%	AMD	35.92%
252.0	ORLY	66.65%	CCL	35.92%
252.0	MU	65.25%	ETRN	35.78%
252.0	CMG	63.56%	AMAT	35.61%
252.0	TDG	61.22%	CPRT	34.25%
252.0	VNO	61.12%	MU	32.93%
252.0	CPRT	58.03%	CDNS	32.86%
252.0	PCG	56.05%	MSI	32.15%

Bottom 30 Tickers By ROEUB

All TMD: 1d

Results reflect ticker level average ROEUB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEUB_V	Ticker_S	ROEUB_S
1.0	AVGO	-52.89%	AVGO	-53.02%
1.0	LUMN	-0.57%	SIVBQ	-0.78%
1.0	SIVBQ	-0.53%	SBNY	-0.45%
1.0	IEP	-0.38%	FRCB	-0.23%
1.0	CZR	-0.25%	IEP	-0.18%
1.0	SBNY	-0.24%	AAP	-0.18%
1.0	NWL	-0.23%	AMC	-0.17%
1.0	GNRC	-0.16%	VFC	-0.13%
1.0	BIIB	-0.1%	LUMN	-0.11%
1.0	UAA	-0.1%	NWL	-0.11%
1.0	FRCB	-0.1%	CZR	-0.08%
1.0	AAP	-0.1%	UAA	-0.08%
1.0	CYH	-0.09%	BHC	-0.08%
1.0	AA	-0.08%	ELAN	-0.07%
1.0	VFC	-0.07%	BALL	-0.06%
1.0	BXP	-0.07%	INTC	-0.05%
1.0	CHTR	-0.06%	TLT	-0.05%
1.0	BA	-0.06%	GT	-0.05%
1.0	RIO	-0.06%	GNRC	-0.04%
1.0	BALL	-0.06%	BIIB	-0.04%
1.0	TLT	-0.06%	CYH	-0.04%
1.0	BHP	-0.05%	BXP	-0.04%
1.0	GSK	-0.05%	LNC	-0.04%
1.0	CLF	-0.05%	CVS	-0.04%
1.0	CSTM	-0.04%	CLF	-0.04%
1.0	BHC	-0.04%	GSK	-0.03%
1.0	NAVI	-0.04%	FIS	-0.03%
1.0	VZ	-0.03%	CHTR	-0.03%
1.0	CMA	-0.03%	TFC	-0.03%
1.0	CTLT	-0.03%	CSTM	-0.03%

All TMD: 10d

Results reflect ticker level average ROEUB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEUB_V	Ticker_S	ROEUB_S
10.0	AVGO	-46.16%	AVGO	-52.78%
10.0	SIVBQ	-3.66%	SBNY	-4.05%
10.0	IEP	-3.24%	SIVBQ	-3.9%
10.0	LUMN	-3.17%	FRCB	-2.19%
10.0	CZR	-2.96%	AAP	-1.75%
10.0	NWL	-1.9%	AMC	-1.75%
10.0	SBNY	-1.64%	IEP	-1.67%
10.0	GNRC	-1.54%	VFC	-1.25%
10.0	AAP	-1.23%	NWL	-1.1%
10.0	FRCB	-1.18%	UAA	-0.92%
10.0	UAA	-1.03%	CZR	-0.91%
10.0	VFC	-0.97%	ELAN	-0.8%
10.0	AMC	-0.89%	LUMN	-0.75%
10.0	BXP	-0.77%	CYH	-0.75%
10.0	CYH	-0.73%	BHC	-0.6%
10.0	BALL	-0.69%	BALL	-0.58%
10.0	BIIB	-0.69%	TLT	-0.5%
10.0	CLF	-0.66%	GT	-0.49%
10.0	INTC	-0.56%	BXP	-0.44%
10.0	AA	-0.55%	INTC	-0.44%
10.0	TLT	-0.44%	LNC	-0.43%
10.0	FSUGY	-0.42%	GNRC	-0.43%
10.0	CMA	-0.38%	BIIB	-0.42%
10.0	FIS	-0.37%	ZION	-0.39%
10.0	LNC	-0.34%	CVS	-0.37%
10.0	CVS	-0.33%	CHTR	-0.35%
10.0	VZ	-0.3%	CLF	-0.34%
10.0	BHP	-0.29%	FIS	-0.33%
10.0	GSK	-0.28%	GSK	-0.33%
10.0	CMCSA	-0.25%	TFC	-0.33%

All TMD: 21d

Results reflect ticker level average ROEUB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEUB_V	Ticker_S	ROEUB_S
21.0	AVGO	-49.08%	AVGO	-52.48%
21.0	SIVBQ	-8.0%	SBNY	-11.16%
21.0	IEP	-7.6%	SIVBQ	-9.37%
21.0	CZR	-6.3%	FRCB	-6.02%
21.0	LUMN	-4.93%	AMC	-4.22%
21.0	SBNY	-4.88%	AAP	-3.66%
21.0	GNRC	-3.46%	IEP	-3.58%
21.0	NWL	-3.32%	VFC	-2.45%
21.0	FRCB	-3.24%	NWL	-2.41%
21.0	AAP	-2.65%	CZR	-1.94%
21.0	VFC	-2.35%	UAA	-1.66%
21.0	UAA	-1.84%	ELAN	-1.54%
21.0	CLF	-1.66%	BHC	-1.5%
21.0	AMC	-1.58%	CYH	-1.26%
21.0	BXP	-1.43%	LUMN	-1.2%
21.0	BALL	-1.38%	BALL	-1.19%
21.0	INTC	-1.26%	INTC	-1.16%
21.0	FSUGY	-1.08%	LNC	-1.04%
21.0	CYH	-1.08%	TLT	-1.03%
21.0	TLT	-1.06%	BXP	-1.01%
21.0	AA	-1.02%	GNRC	-0.97%
21.0	MOS	-0.89%	GT	-0.94%
21.0	CVS	-0.84%	AA	-0.91%
21.0	VZ	-0.84%	MOS	-0.84%
21.0	CMA	-0.81%	CVS	-0.79%
21.0	BIIB	-0.74%	BIIB	-0.78%
21.0	BHP	-0.73%	CHTR	-0.76%
21.0	LNC	-0.7%	CLF	-0.74%
21.0	FIS	-0.67%	CSTM	-0.7%
21.0	KHC	-0.49%	TFC	-0.65%

All TMD: 63d

Results reflect ticker level average ROEUB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEUB_V	Ticker_S	ROEUB_S
63.0	AVGO	-56.66%	AVGO	-51.31%
63.0	SIVBQ	-30.27%	SBNY	-37.59%
63.0	IEP	-26.1%	SIVBQ	-33.73%
63.0	SBNY	-19.01%	FRCB	-24.04%
63.0	FRCB	-15.74%	AMC	-15.98%
63.0	GNRC	-13.4%	IEP	-12.03%
63.0	LUMN	-12.27%	AAP	-10.59%
63.0	NWL	-11.41%	NWL	-6.49%
63.0	AAP	-9.48%	VFC	-5.79%
63.0	CZR	-9.31%	MOS	-5.71%
63.0	VFC	-8.89%	CZR	-5.26%
63.0	AMC	-8.65%	CLF	-5.1%
63.0	CLF	-7.49%	INTC	-4.58%
63.0	MOS	-6.53%	BHC	-4.43%
63.0	UAA	-6.06%	ELAN	-4.35%
63.0	BALL	-5.9%	CVS	-4.04%
63.0	INTC	-4.5%	AA	-4.0%
63.0	CVS	-4.34%	UAA	-3.92%
63.0	CYH	-4.06%	BALL	-3.43%
63.0	AA	-3.92%	LNC	-3.31%
63.0	VZ	-3.7%	TLT	-3.03%
63.0	BXP	-3.66%	BXP	-2.97%
63.0	CSTM	-3.48%	CSTM	-2.76%
63.0	TLT	-3.38%	NEM	-2.6%
63.0	BHP	-3.36%	PRGO	-2.45%
63.0	FSUGY	-3.04%	LUMN	-2.44%
63.0	CHTR	-2.68%	GT	-2.41%
63.0	KHC	-2.63%	GNRC	-2.39%
63.0	BHC	-2.49%	CHTR	-2.32%
63.0	PRGO	-2.07%	CNC	-2.25%

All TMD: 126d

Results reflect ticker level average ROEUB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEUB_V	Ticker_S	ROEUB_S
126.0	SIVBQ	-64.31%	SIVBQ	-65.15%
126.0	AVGO	-63.96%	SBNY	-64.8%
126.0	IEP	-47.51%	AVGO	-51.37%
126.0	FRCB	-39.92%	FRCB	-51.17%
126.0	SBNY	-33.47%	AMC	-29.19%
126.0	NWL	-30.26%	IEP	-22.25%
126.0	GNRC	-25.19%	AAP	-21.48%
126.0	LUMN	-20.6%	NWL	-13.64%
126.0	AAP	-20.15%	MOS	-12.52%
126.0	VFC	-19.79%	VFC	-10.81%
126.0	AMC	-16.4%	CVS	-8.87%
126.0	MOS	-16.16%	CLF	-8.38%
126.0	CVS	-11.4%	INTC	-7.34%
126.0	CLF	-10.92%	CZR	-6.89%
126.0	CZR	-8.5%	ELAN	-6.74%
126.0	BALL	-8.33%	PRGO	-6.26%
126.0	GT	-7.45%	LNC	-5.75%
126.0	VZ	-7.15%	CTLT	-5.69%
126.0	UAA	-6.76%	AA	-5.56%
126.0	PRGO	-6.55%	TLT	-5.28%
126.0	LNC	-6.33%	GT	-4.95%
126.0	CTLT	-6.16%	GSK	-4.82%
126.0	TLT	-5.97%	CNC	-4.8%
126.0	CHTR	-5.43%	BHC	-4.58%
126.0	INTC	-5.29%	NEM	-4.4%
126.0	CNC	-5.16%	UAA	-4.2%
126.0	AA	-4.91%	BXP	-4.13%
126.0	BXP	-4.82%	BALL	-4.03%
126.0	BHP	-4.71%	CHTR	-3.71%
126.0	KHC	-4.6%	KHC	-3.43%

All TMD: 252d

Results reflect ticker level average ROEUB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEUB_V	Ticker_S	ROEUB_S
252.0	SIVBQ	-165.64%	SBNY	-95.75%
252.0	FRCB	-122.39%	SIVBQ	-95.29%
252.0	AVGO	-108.8%	FRCB	-91.61%
252.0	IEP	-87.47%	AMC	-60.88%
252.0	SBNY	-81.71%	AVGO	-60.54%
252.0	NWL	-64.56%	IEP	-44.04%
252.0	CVS	-43.77%	AAP	-41.91%
252.0	AAP	-42.54%	NWL	-28.56%
252.0	LUMN	-40.18%	VFC	-26.08%
252.0	VFC	-39.83%	MOS	-25.47%
252.0	MOS	-37.49%	CVS	-20.56%
252.0	GNRC	-35.64%	LUMN	-14.0%
252.0	AMC	-34.99%	BMY	-13.9%
252.0	CLF	-23.31%	PRGO	-13.16%
252.0	CZR	-20.72%	UAA	-12.48%
252.0	PRGO	-17.63%	CZR	-12.38%
252.0	UAA	-17.63%	CLF	-12.2%
252.0	GT	-16.55%	JAZZ	-10.75%
252.0	BMY	-16.36%	CHTR	-10.33%
252.0	JAZZ	-15.38%	AA	-9.65%
252.0	CMA	-14.74%	TLT	-8.94%
252.0	AA	-13.17%	CNC	-8.64%
252.0	CHTR	-12.3%	INTC	-7.38%
252.0	TLT	-11.81%	GT	-7.03%
252.0	KHC	-9.7%	LNC	-6.97%
252.0	CNC	-8.9%	BHC	-6.85%
252.0	VZ	-8.32%	KHC	-6.28%
252.0	BHC	-7.62%	CTLT	-6.24%
252.0	CYH	-7.53%	BIIB	-6.21%
252.0	BALL	-6.91%	NEM	-6.02%

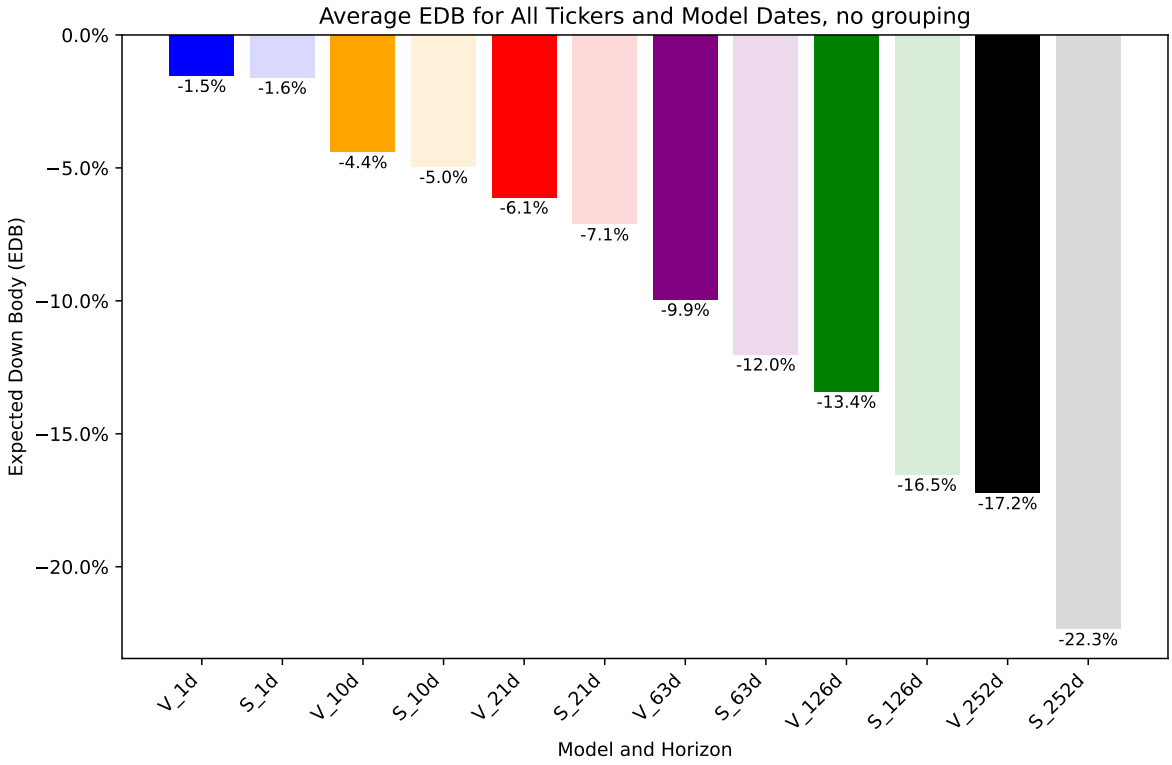
Expected Down Body (EDB)

Historic Average Levels

Here we compare Vector Model ("V", dark shading) and Sigma ("S", light shading) EDB levels by horizon, on average across all ticker-model dates for the lookback window indicated.

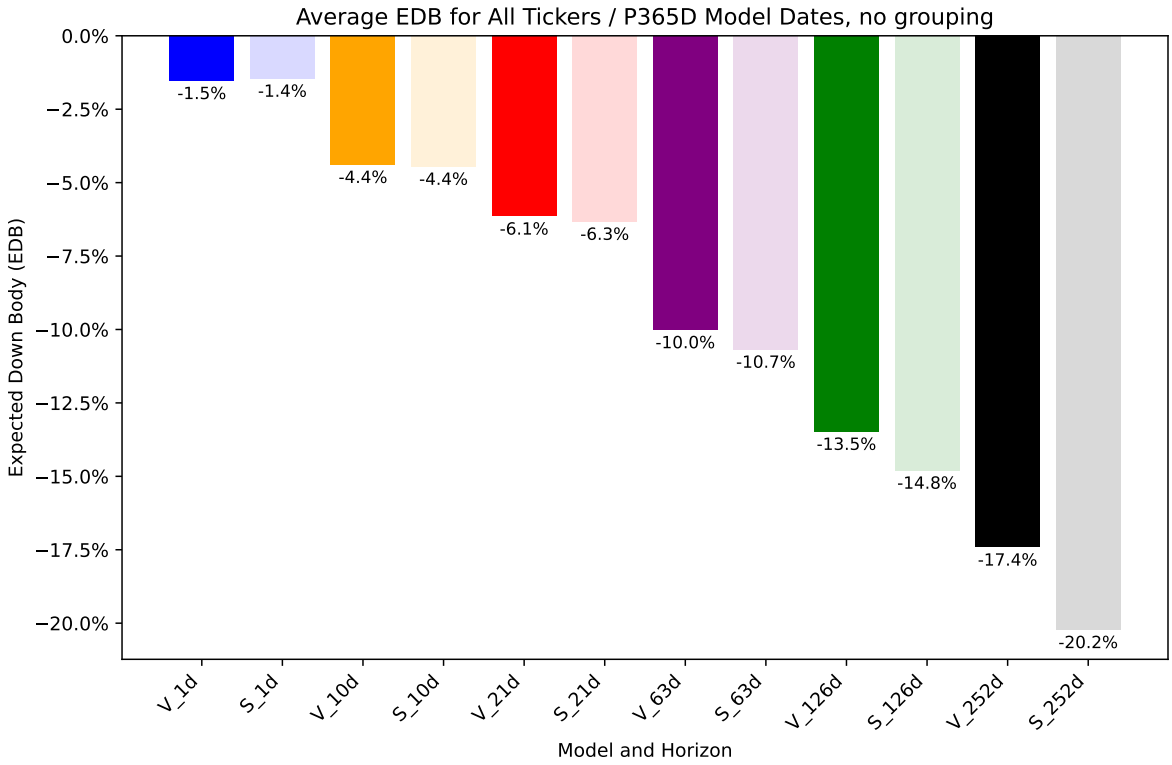
All Out of Sample Model Dates

Period examined: All model dates from 2022-01-31 through 2025-03-28



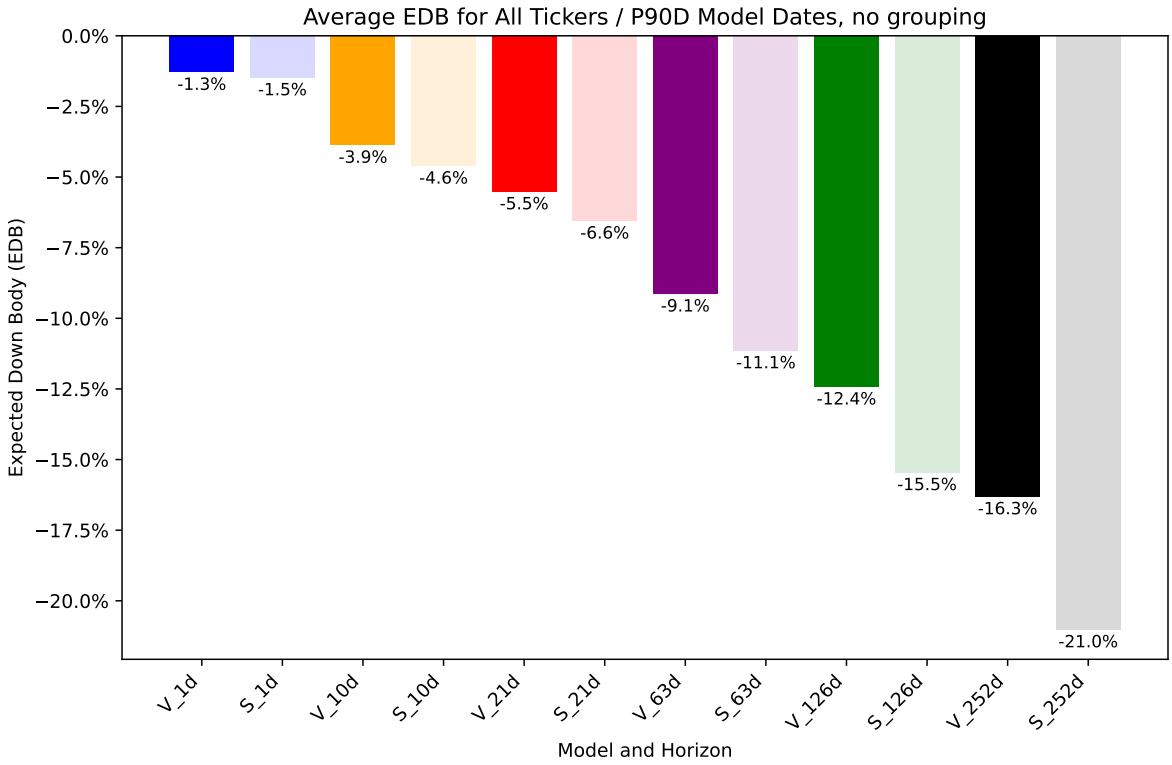
Prior 365 Calendar Days (P365D)

Period examined: All model dates from 2024-04-02 through 2025-03-28



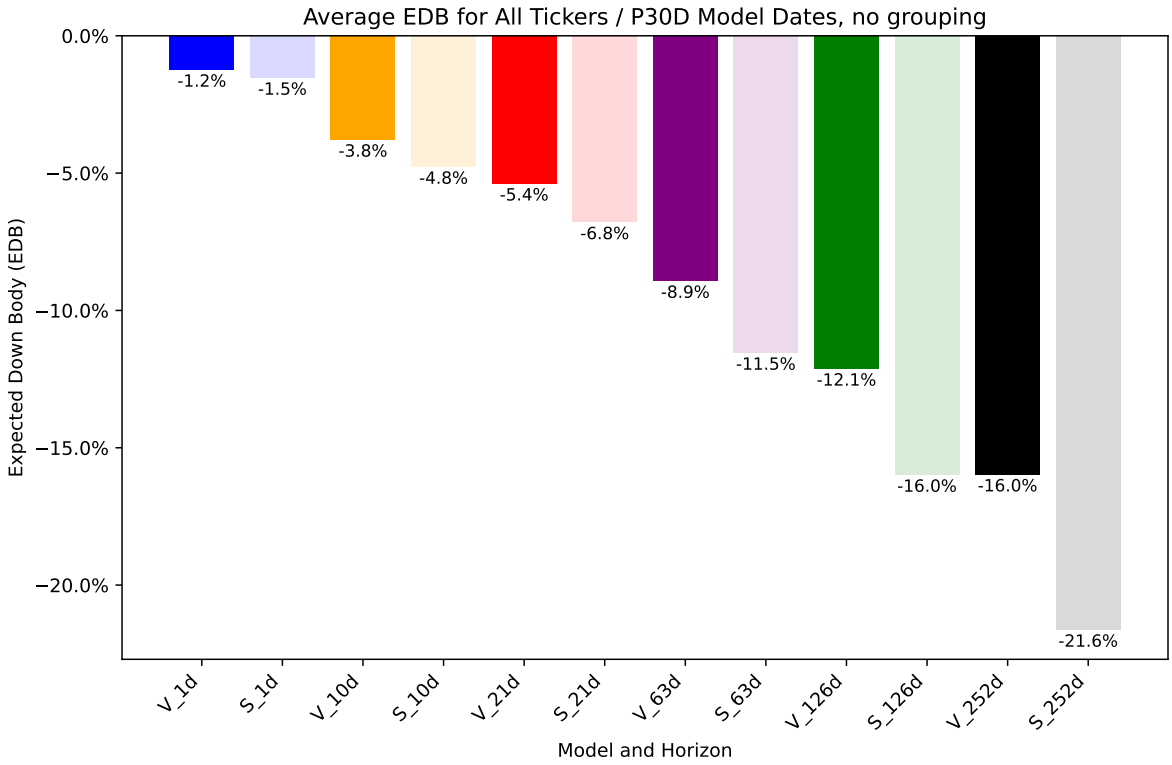
Prior 90 Calendar Days (P90D)

Period examined: All model dates from 2025-01-02 through 2025-03-28



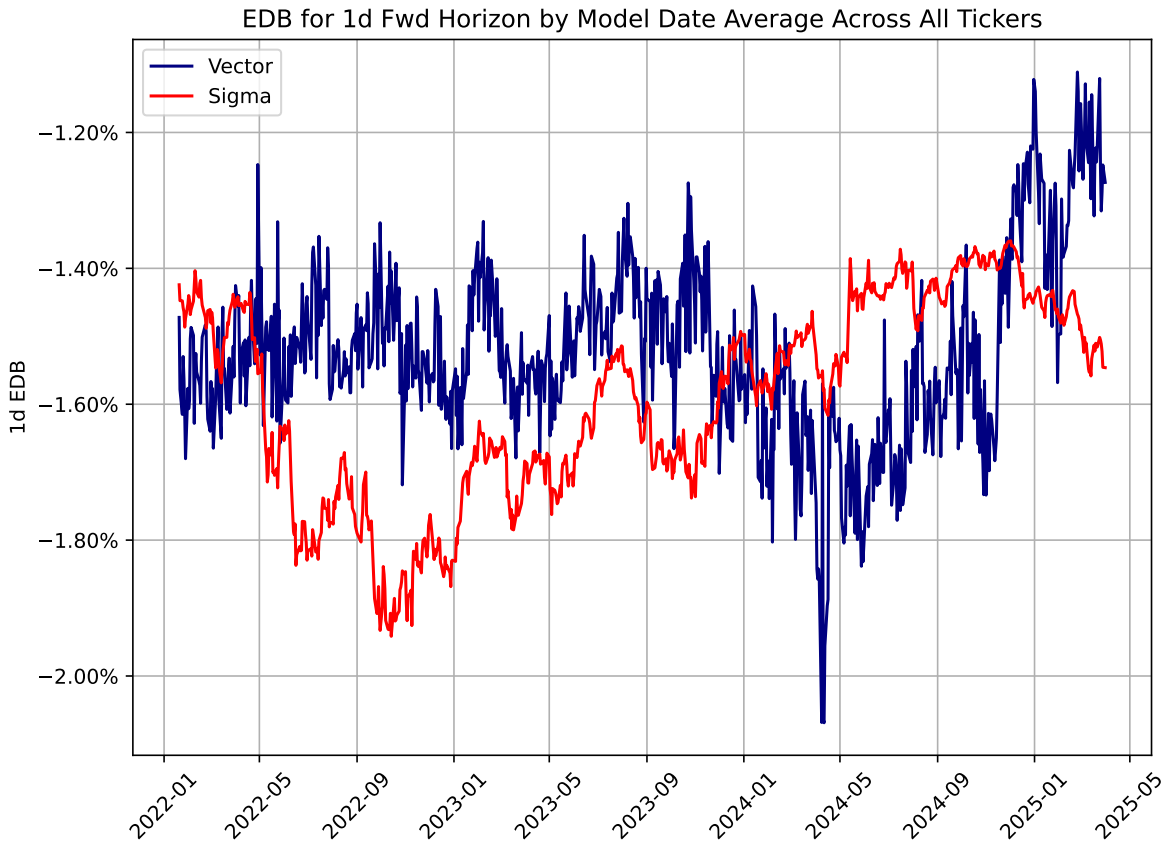
Prior 30 Calendar Days (P30D)

Period examined: All model dates from 2025-03-03 through 2025-03-28

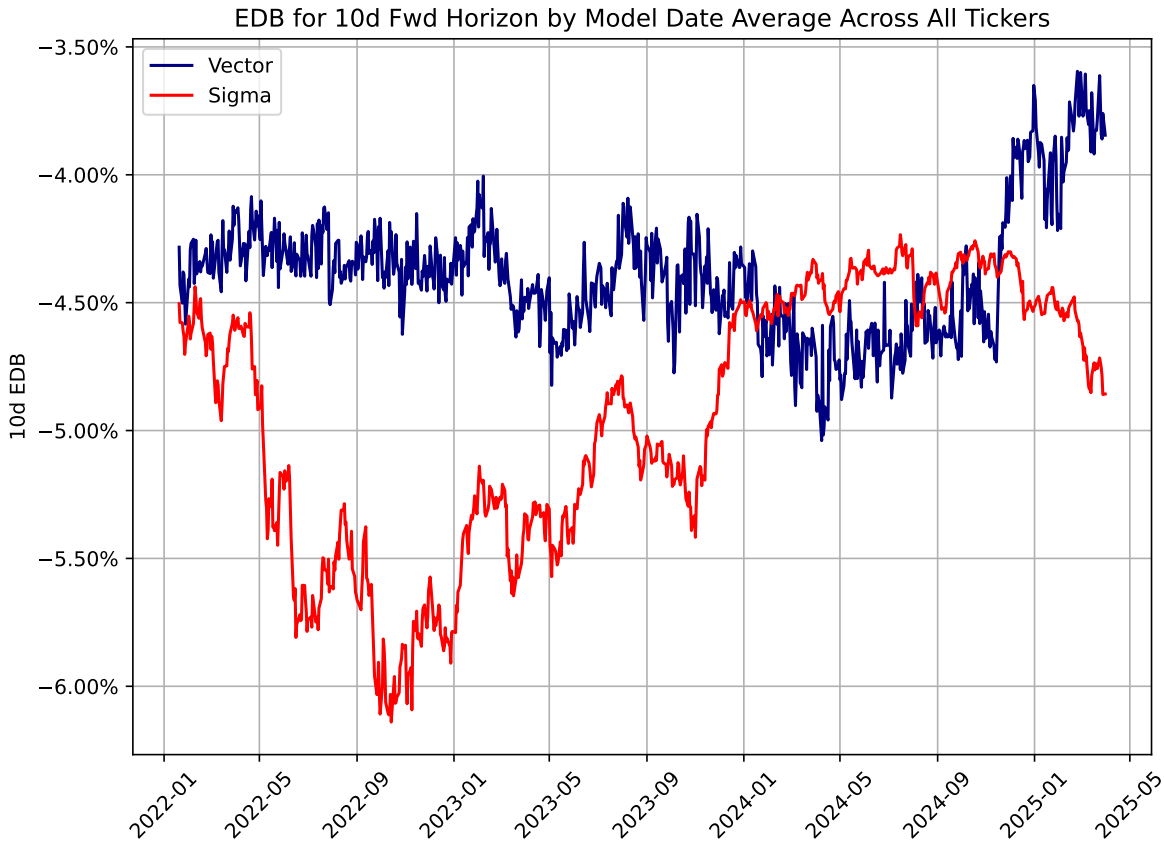


EDB by Model Date Detail

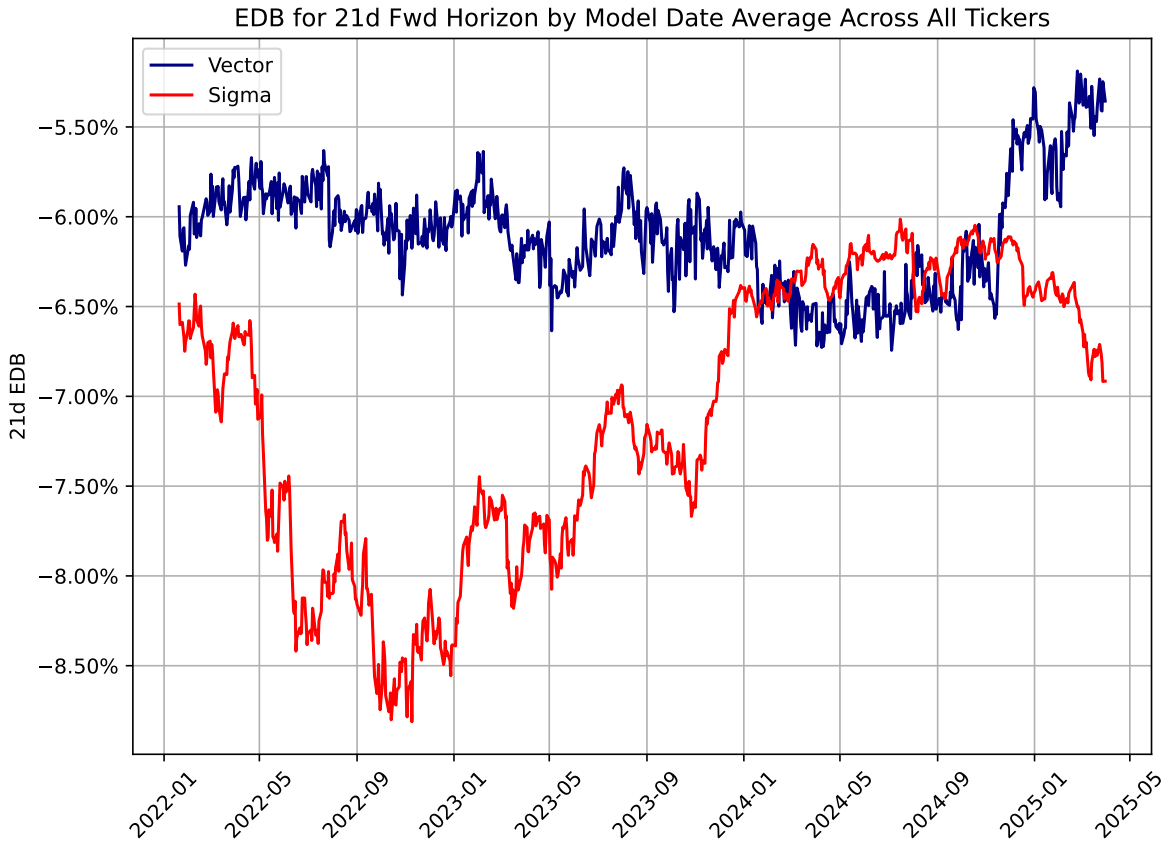
1d Horizon



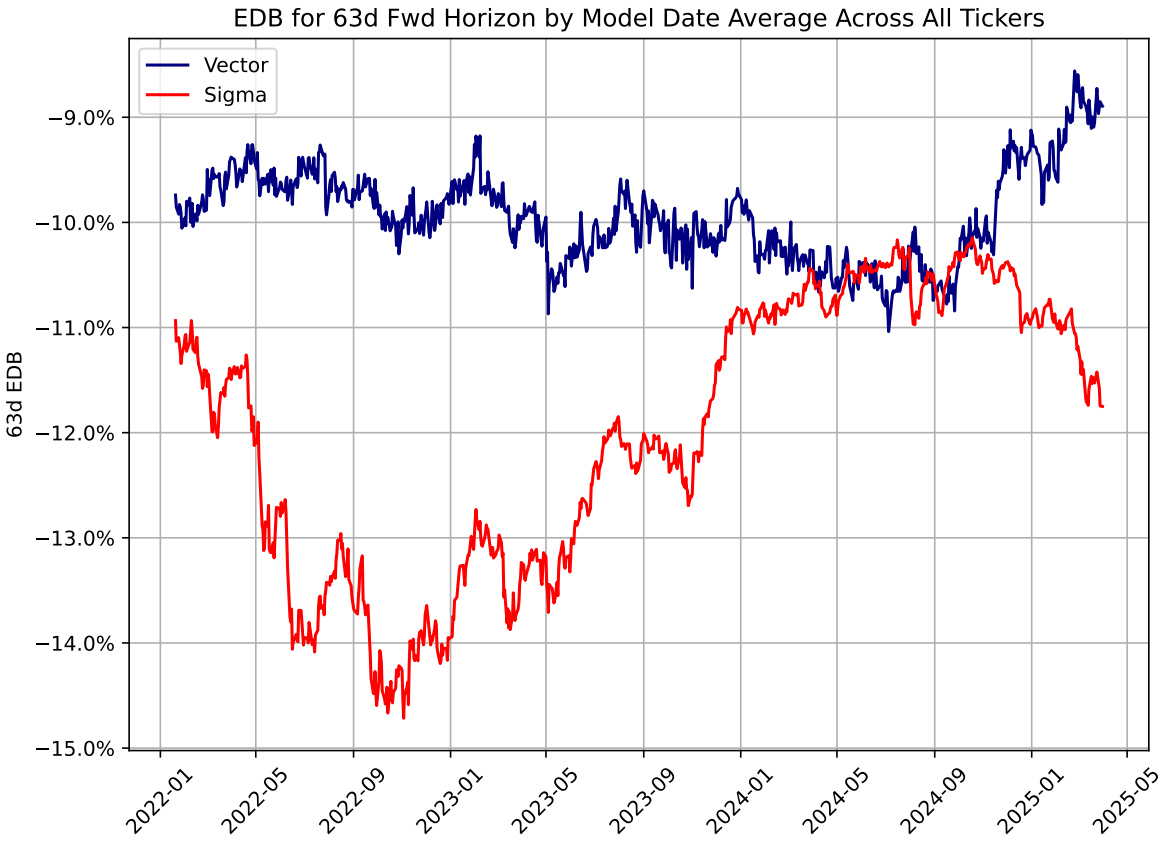
10d Horizon


EDB for 10d Fwd Horizon by Model Date Average Across All Tickers
Vector
Sigma
10d EDB
−3.50%
−4.00%
−4.50%
−5.00%
−5.50%
−6.00%
2022-01
2022-05
2022-09
2023-01
2023-05
2023-09
2024-01
2024-05
2024-09
2025-01
2025-05

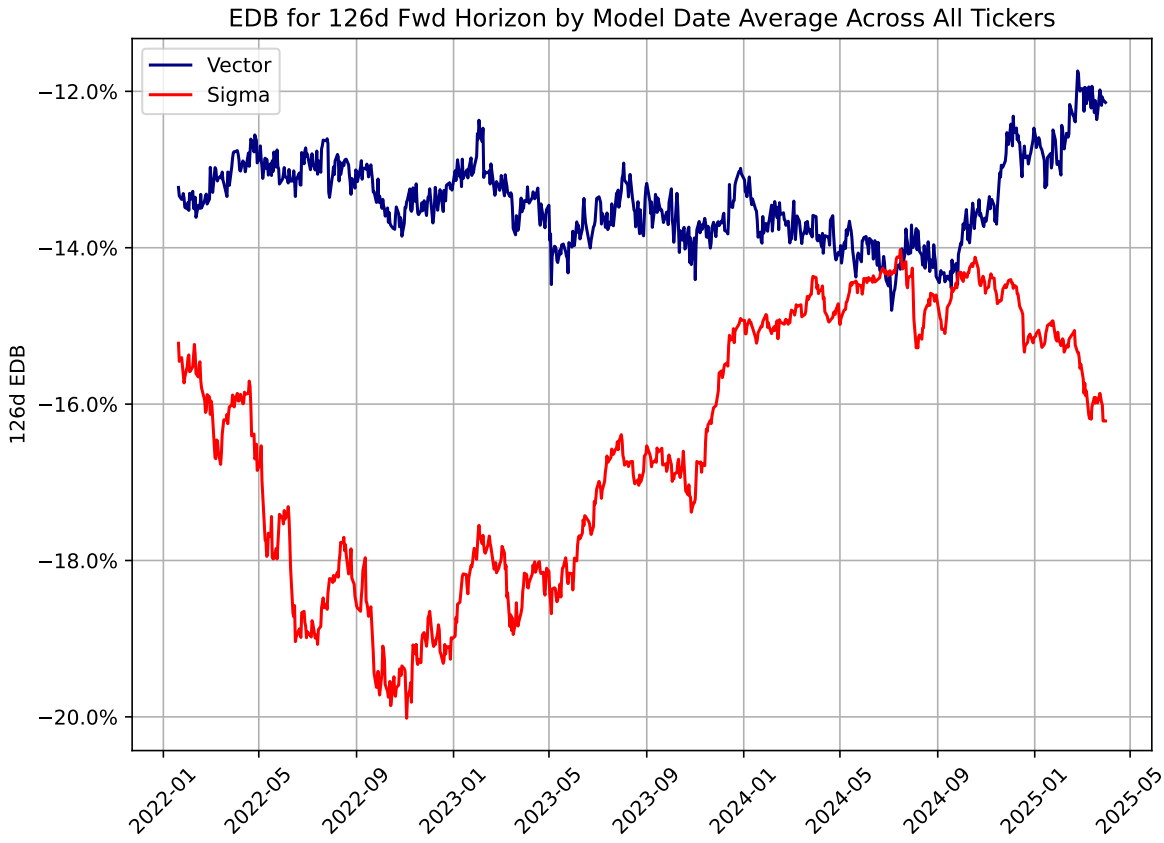
21d Horizon


EDB for 21d Fwd Horizon by Model Date Average Across All Tickers
Vector
Sigma
21d EDB
−5.50%
−6.00%
−6.50%
−7.00%
−7.50%
−8.00%
−8.50%
2022-01
2022-05
2022-09
2023-01
2023-05
2023-09
2024-01
2024-05
2024-09
2025-01
2025-05

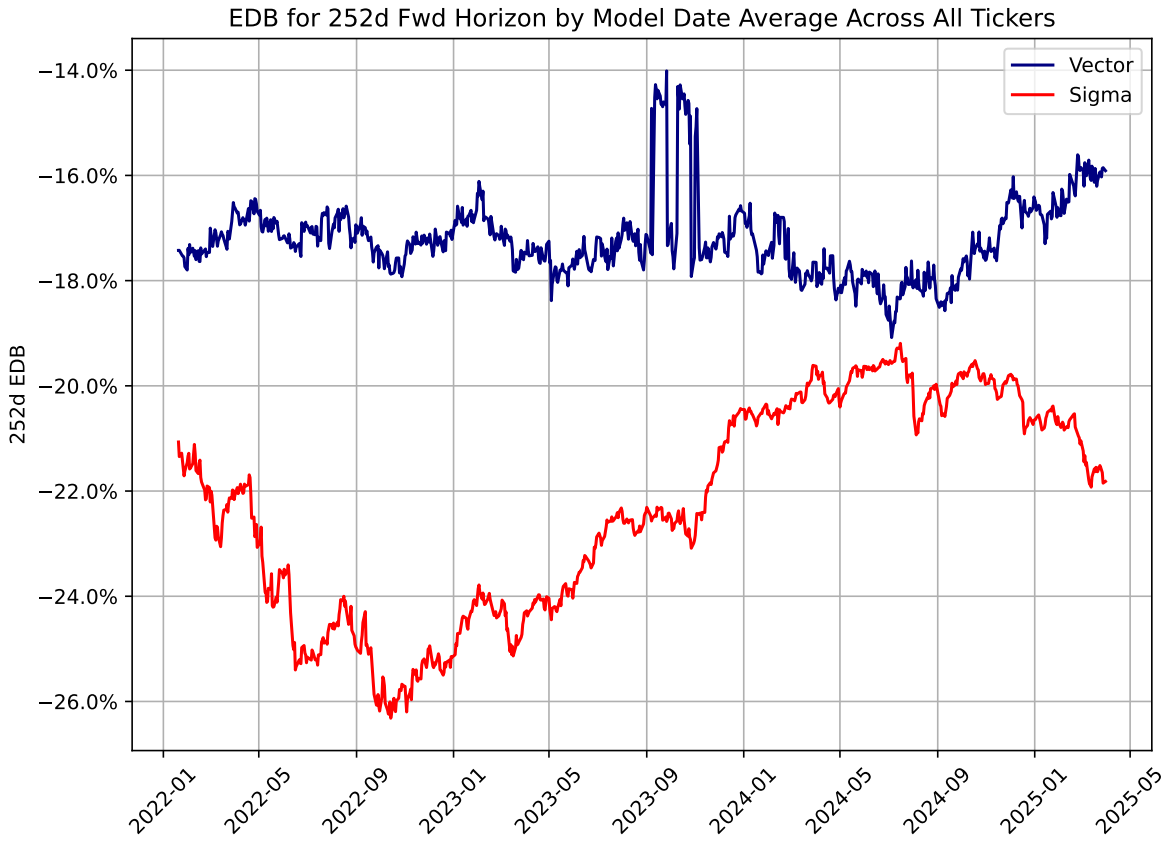
63d Horizon


EDB for 63d Fwd Horizon by Model Date Average Across All Tickers
Vector
Sigma
63d EDB
−9.0%
−10.0%
−11.0%
−12.0%
−13.0%
−14.0%
−15.0%
2022-01
2022-05
2022-09
2023-01
2023-05
2023-09
2024-01
2024-05
2024-09
2025-01
2025-05

126d Horizon



252d Horizon



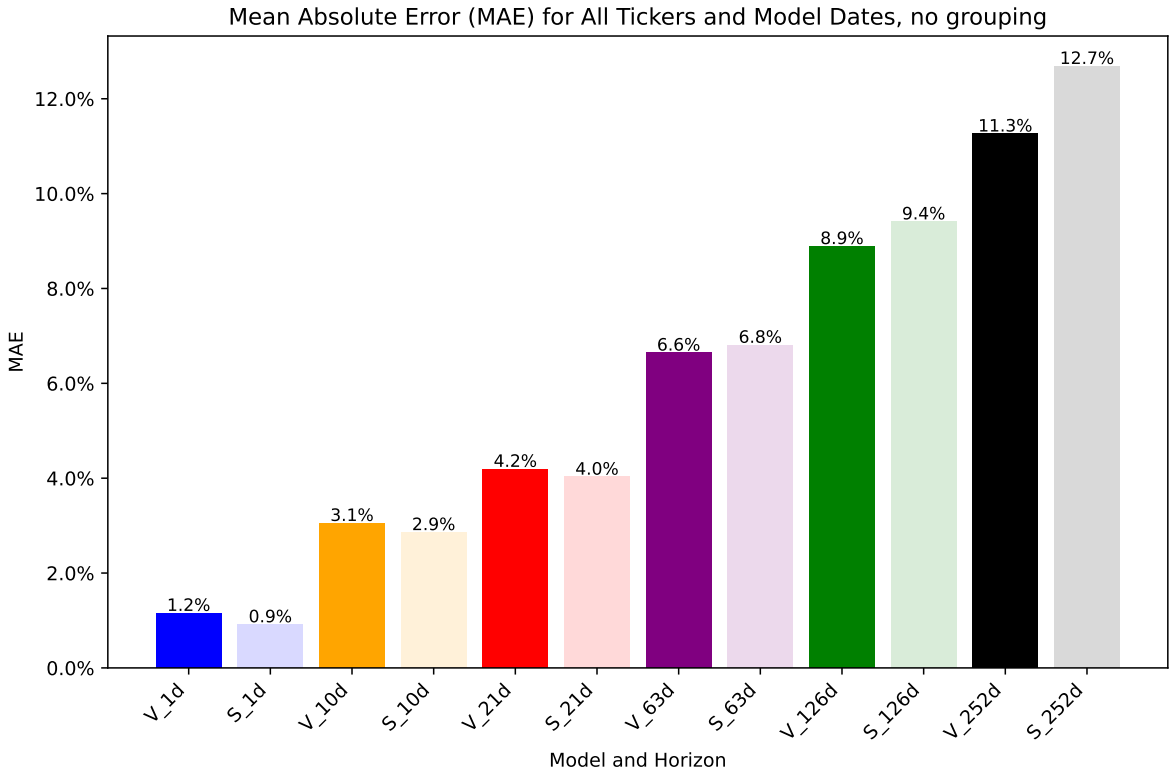
Performance Summary - MAE of EDB vs. Actual Fwd Returns

We use Mean Absolute Error (MAE) to assess how accurate Vector Model EB metrics are relative to those based upon Sigma.

Performance includes only those ticker - model dates whose foward performance is directionally "down" but inside of the 95th %tile forecasted for given model. Thus, these statistics are not perfectly comparable across models, or even horizons. Consider them alongside each model's breakage rates for the 95D percentile (i.e., VaR breakage rates).

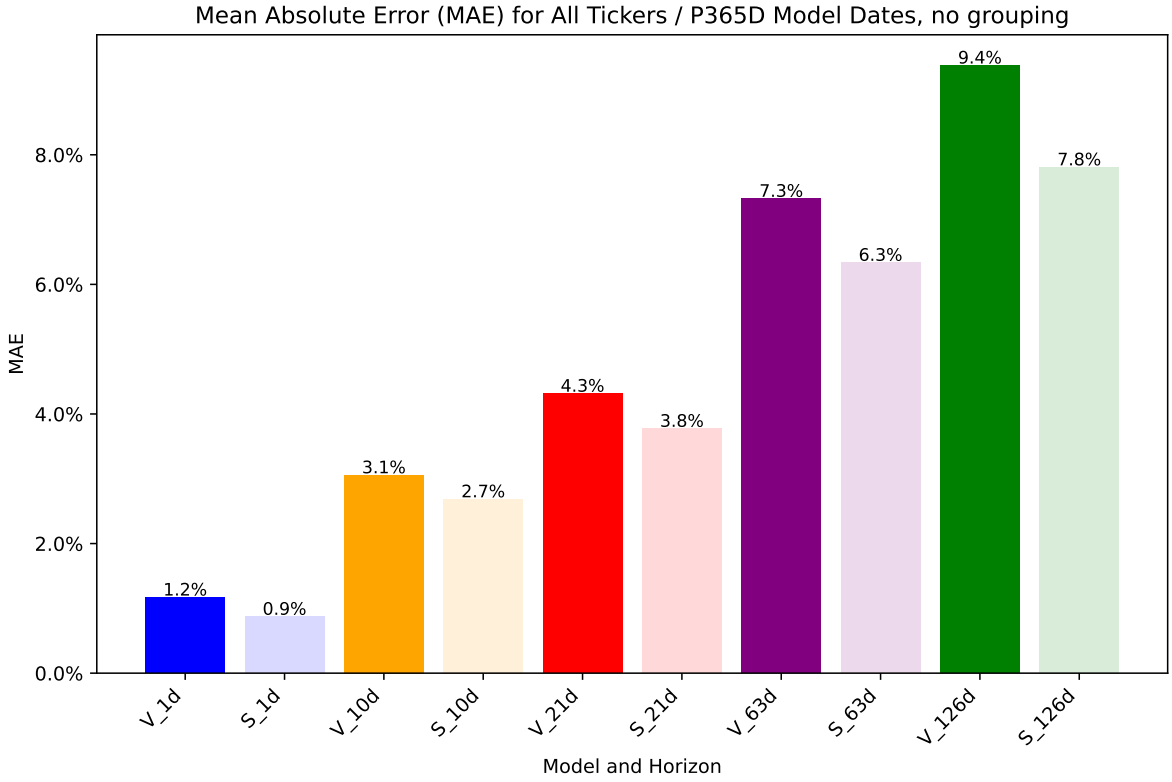
All Out of Sample Model Dates

Period examined: All model dates from 2022-01-31 through 2025-03-28



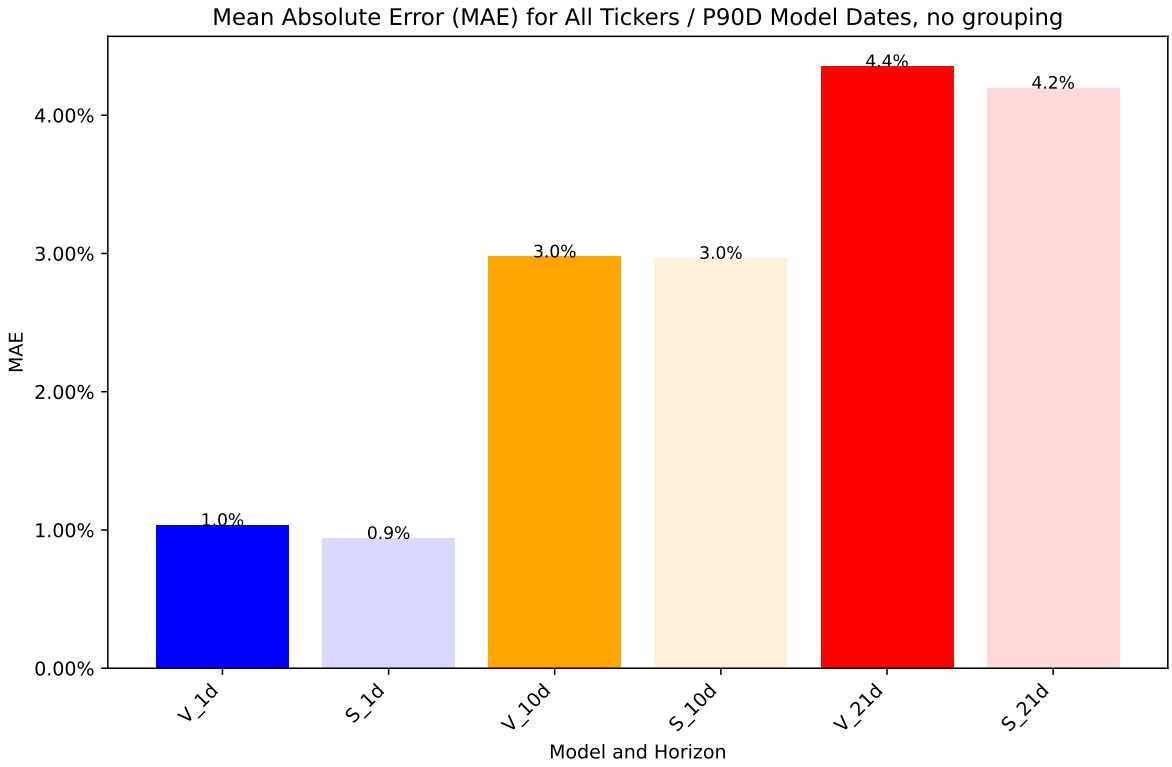
Prior 365 Calendar Days (P365D)

Period examined: All model dates from 2024-04-02 through 2025-03-28



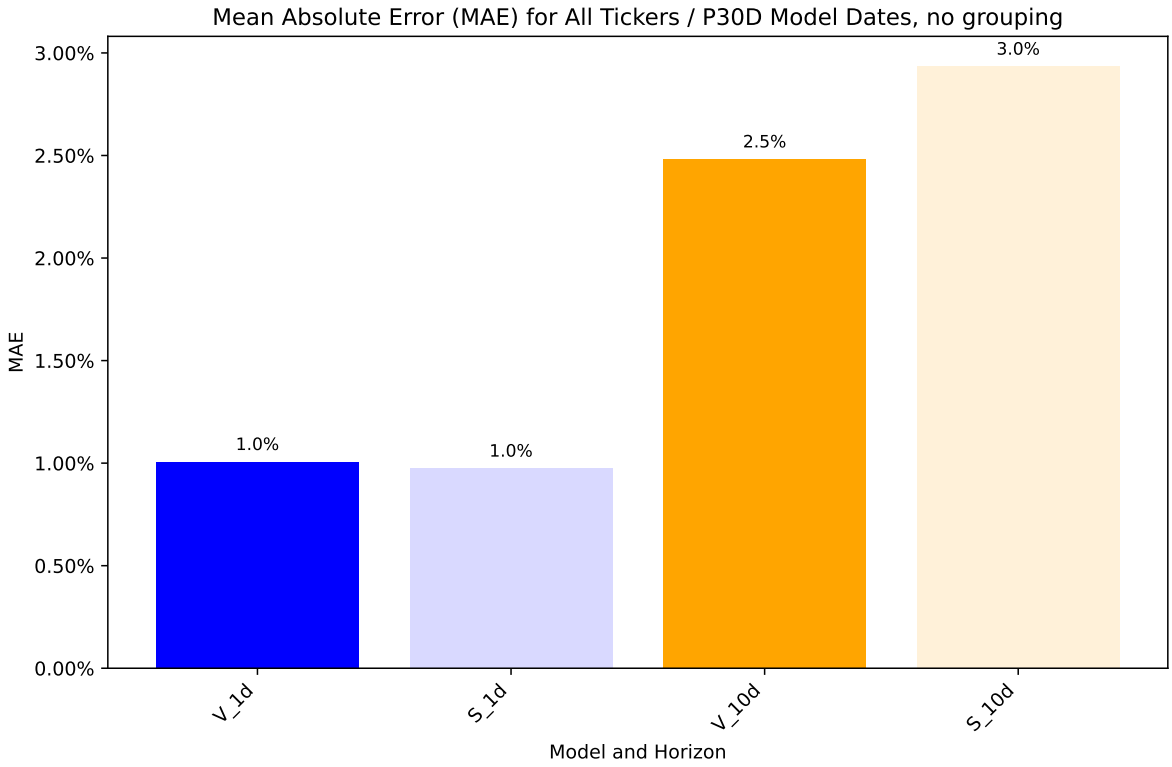
Prior 90 Calendar Days (P90D)

Period examined: All model dates from 2025-01-02 through 2025-03-28



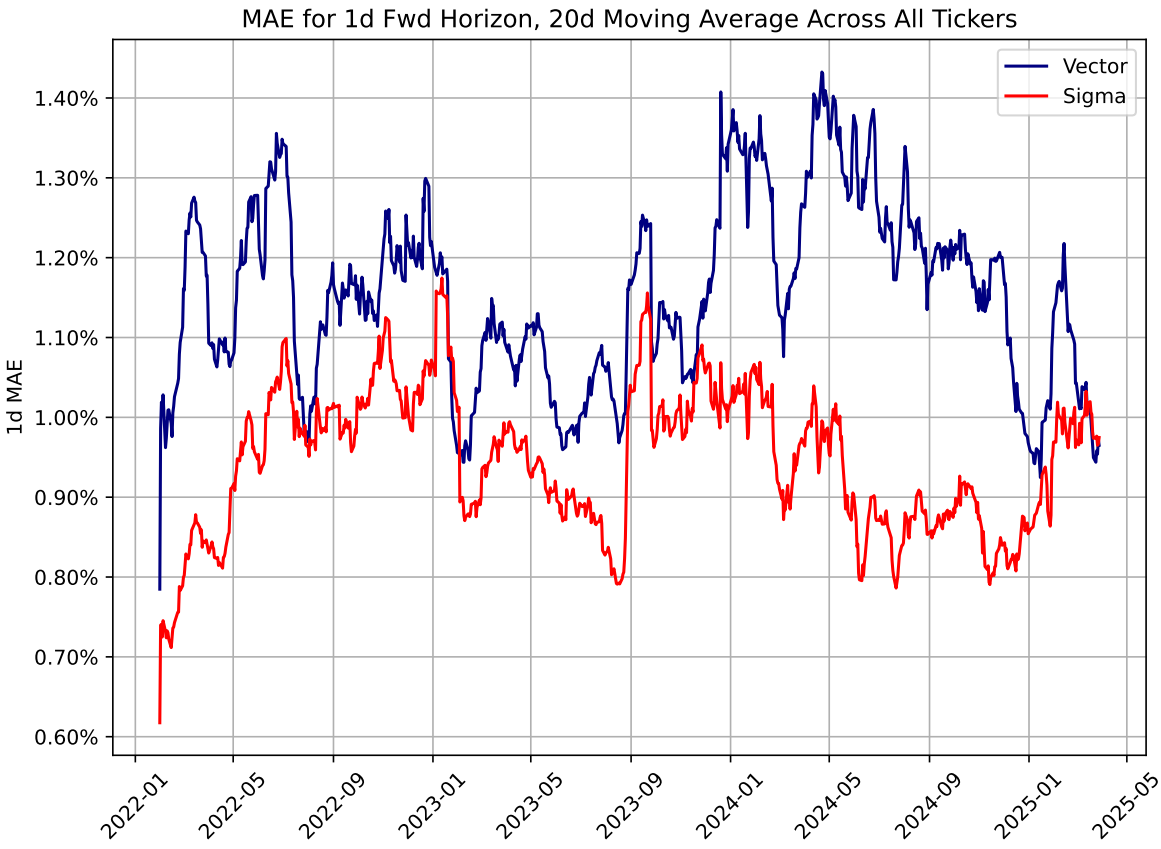
Prior 30 Calendar Days (P30D)

Period examined: All model dates from 2025-03-03 through 2025-03-28

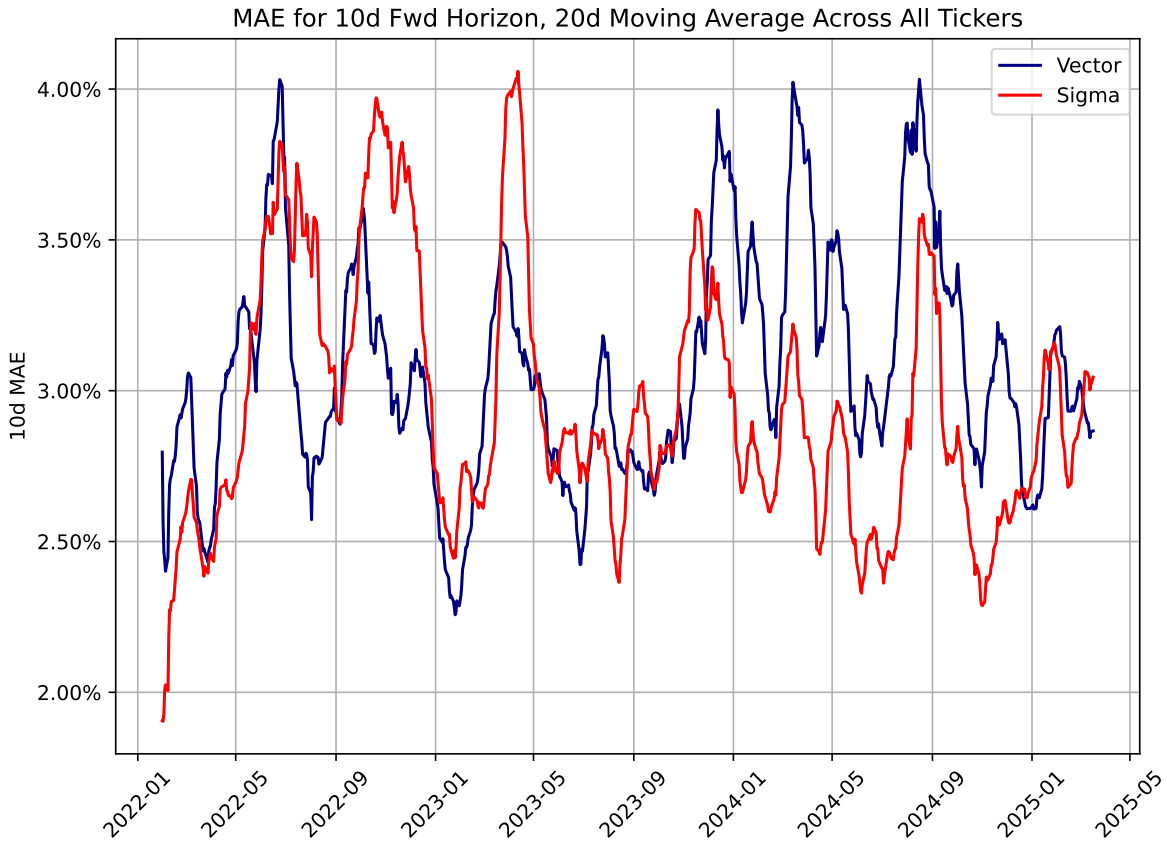


MAE by Model Date Detail

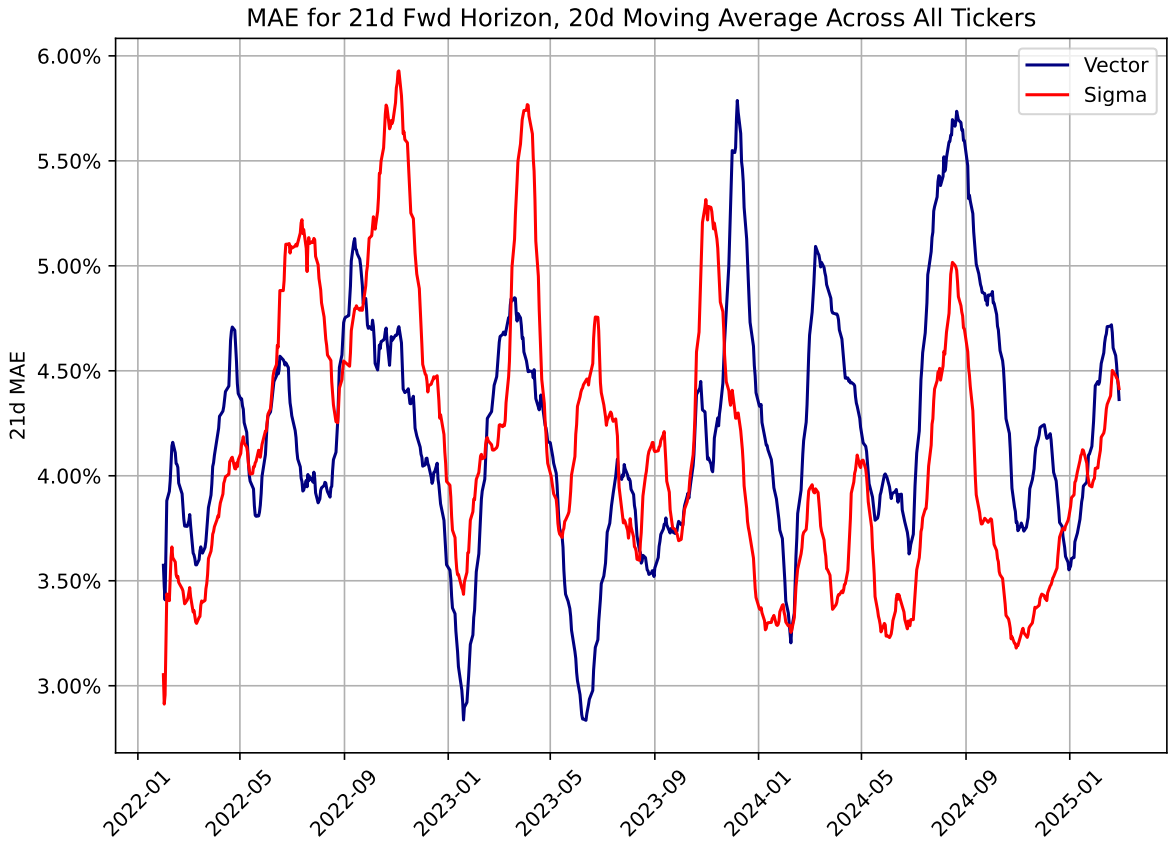
1d Horizon



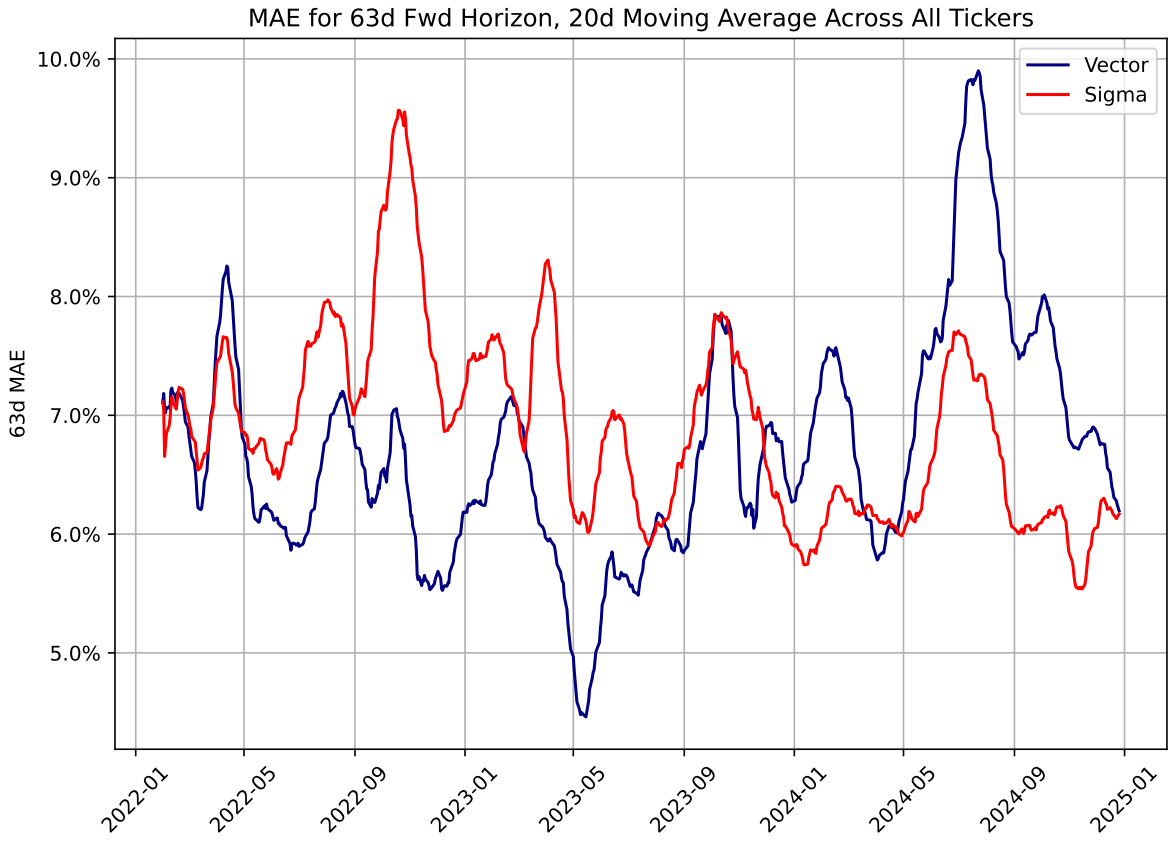
10d Horizon


MAE for 10d Fwd Horizon, 20d Moving Average Across All Tickers
Vector
Sigma
10d MAE
4.00%
3.50%
3.00%
2.50%
2.00%
2022-01
2022-05
2022-09
2023-01
2023-05
2023-09
2024-01
2024-05
2024-09
2025-01
2025-05

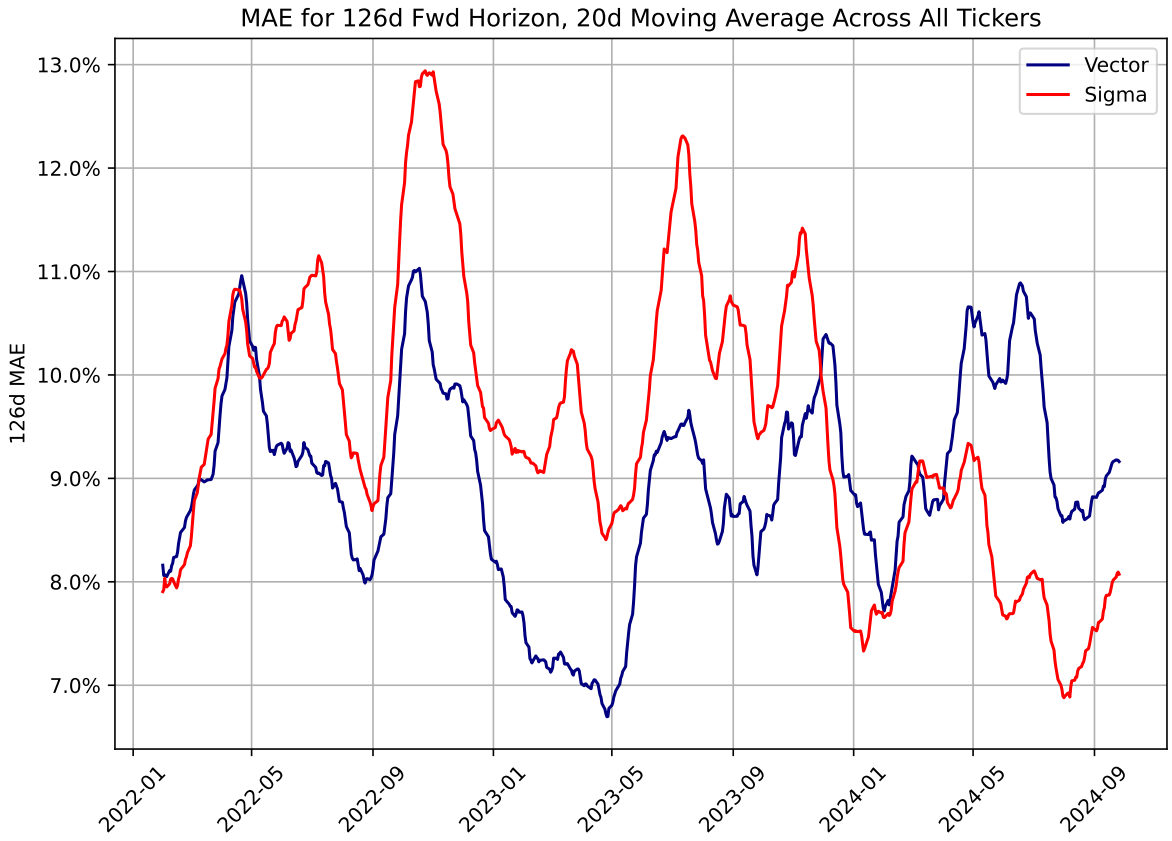
21d Horizon


MAE for 21d Fwd Horizon, 20d Moving Average Across All Tickers
Vector
Sigma
21d MAE
6.00%
5.50%
5.00%
4.50%
4.00%
3.50%
3.00%
2022-01
2022-05
2022-09
2023-01
2023-05
2023-09
2024-01
2024-05
2024-09
2025-01

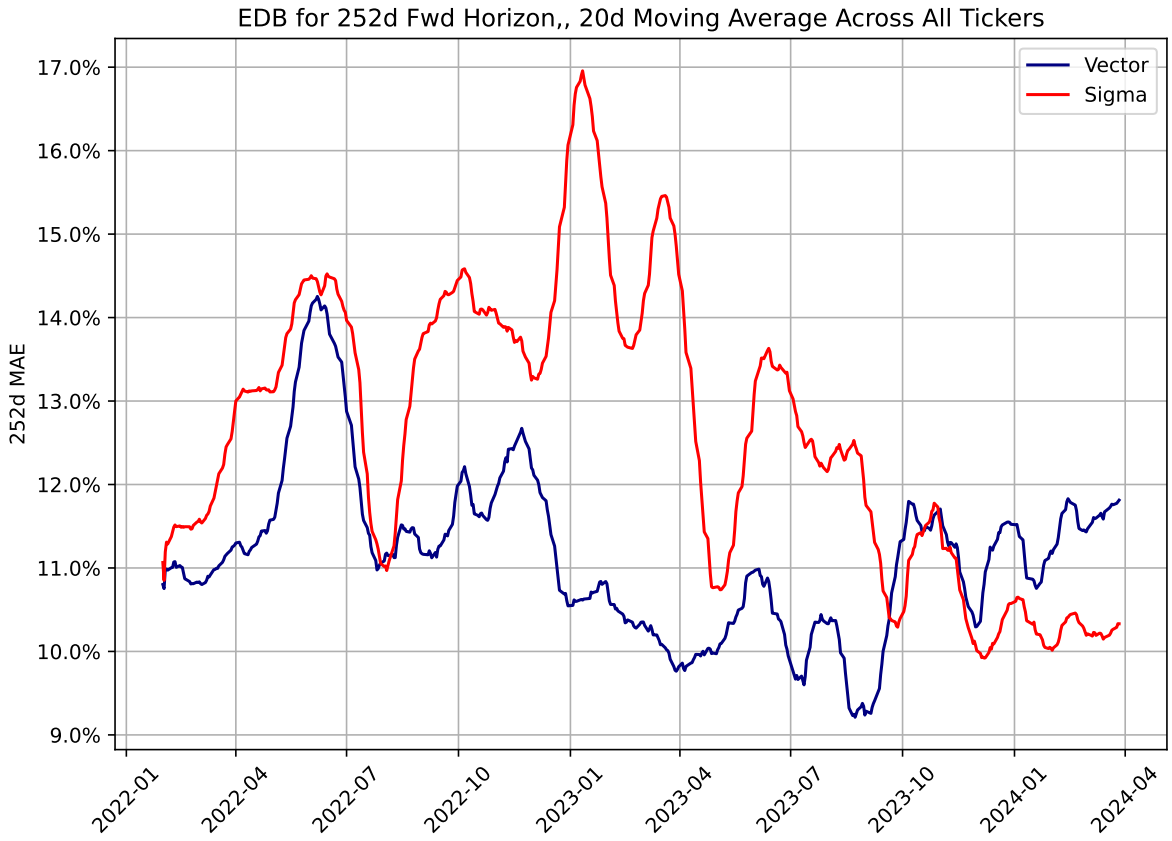
63d Horizon


MAE for 63d Fwd Horizon, 20d Moving Average Across All Tickers
63d MAE
10.0%
9.0%
8.0%
7.0%
6.0%
5.0%
Vector
Sigma
2022-01
2022-05
2022-09
2023-01
2023-05
2023-09
2024-01
2024-05
2024-09
2025-01

126d Horizon



252d Horizon



Top 30 Tickers By EDB MAE

All TMD: 1d

Results reflect ticker level average EDB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EDB" metric - negative performance within the expected 95%tile .

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EDB-MAE_V	Ticker_S	EDB-MAE_S
1.0	AMC	12.4%	AMC	10.48%
1.0	CZR	3.94%	GME	3.01%
1.0	CYH	3.49%	CYH	2.95%
1.0	GBTC	3.45%	LUMN	2.43%
1.0	LUMN	3.19%	GBTC	2.0%
1.0	AMAT	3.02%	MSTR	1.98%
1.0	TSLA	2.76%	BHC	1.81%
1.0	NVDA	2.35%	IEP	1.61%
1.0	PHM	2.28%	TSLA	1.4%
1.0	CCL	2.27%	CTLT	1.4%
1.0	VNO	1.94%	CCL	1.38%
1.0	MSFT	1.94%	UAA	1.37%
1.0	GNRC	1.86%	GNRC	1.36%
1.0	GT	1.85%	AA	1.36%
1.0	BHC	1.81%	SIVBQ	1.34%
1.0	ELAN	1.8%	SBNY	1.27%
1.0	MSTR	1.76%	CZR	1.26%
1.0	IEP	1.69%	VFC	1.26%
1.0	THC	1.67%	GT	1.25%
1.0	AMD	1.6%	CLF	1.23%
1.0	AVGO	1.6%	AMD	1.2%
1.0	PWR	1.57%	LNC	1.18%
1.0	MS	1.53%	NWL	1.16%
1.0	MOS	1.53%	AAP	1.16%
1.0	CLF	1.51%	NVDA	1.14%
1.0	X	1.5%	ON	1.1%
1.0	VST	1.47%	KALU	1.09%
1.0	GME	1.42%	X	1.09%
1.0	NWL	1.4%	META	1.09%
1.0	ETRN	1.39%	NFLX	1.07%

All TMD: 10d

Results reflect ticker level average EDB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EDB" metric - negative performance within the expected 95%tile .

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EDB-MAE_V	Ticker_S	EDB-MAE_S
10.0	AMC	26.08%	AMC	19.98%
10.0	GBTC	9.95%	CYH	9.58%
10.0	CYH	9.23%	GME	9.21%
10.0	LUMN	7.37%	LUMN	8.02%
10.0	CZR	6.21%	GBTC	7.08%
10.0	GT	5.66%	MSTR	6.53%
10.0	CCL	5.66%	BHC	5.64%
10.0	NVDA	5.51%	GNRC	4.56%
10.0	AMAT	5.19%	IEP	4.55%
10.0	VNO	5.12%	UAA	4.5%
10.0	IEP	5.04%	TSLA	4.46%
10.0	PHM	4.98%	CCL	4.46%
10.0	X	4.71%	AA	4.43%
10.0	LNC	4.71%	CTLT	4.36%
10.0	BHC	4.66%	LNC	4.35%
10.0	MSTR	4.59%	GT	4.35%
10.0	TSLA	4.57%	VFC	4.2%
10.0	MU	4.19%	CLF	4.18%
10.0	NWL	4.07%	NWL	4.14%
10.0	SIVBQ	4.01%	SBNY	4.13%
10.0	THC	3.99%	CZR	3.92%
10.0	CLF	3.96%	NVDA	3.84%
10.0	AA	3.95%	SIVBQ	3.83%
10.0	MSFT	3.92%	AAP	3.67%
10.0	GME	3.89%	INTC	3.5%
10.0	AMD	3.87%	AMD	3.47%
10.0	ELAN	3.85%	X	3.46%
10.0	ON	3.76%	ELAN	3.45%
10.0	TEVA	3.71%	EXPE	3.44%
10.0	ETRN	3.66%	VNO	3.4%

All TMD: 21d

Results reflect ticker level average EDB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EDB" metric - negative performance within the expected 95%tile .

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EDB-MAE_V	Ticker_S	EDB-MAE_S
21.0	AMC	34.15%	AMC	19.69%
21.0	GBTC	12.01%	GME	12.46%
21.0	CYH	10.33%	LUMN	12.06%
21.0	LUMN	9.45%	CYH	10.57%
21.0	NVDA	8.27%	GBTC	9.91%
21.0	CZR	7.36%	BHC	8.55%
21.0	CCL	7.16%	MSTR	8.54%
21.0	AMAT	7.09%	CTLT	6.81%
21.0	IEP	6.97%	CCL	6.7%
21.0	GT	6.95%	LNC	6.37%
21.0	BHC	6.63%	GNRC	6.18%
21.0	VNO	6.62%	GT	6.1%
21.0	TSLA	6.49%	AA	6.07%
21.0	PHM	6.4%	NWL	6.06%
21.0	LNC	6.36%	UAA	6.04%
21.0	AVGO	6.32%	TSLA	5.96%
21.0	ELAN	6.15%	CLF	5.91%
21.0	MSTR	6.14%	IEP	5.9%
21.0	NWL	5.97%	ELAN	5.83%
21.0	GME	5.84%	SIVBQ	5.75%
21.0	TEVA	5.77%	CZR	5.67%
21.0	CLF	5.66%	VFC	5.62%
21.0	X	5.63%	X	5.61%
21.0	THC	5.35%	NVDA	5.49%
21.0	MOS	5.29%	NFLX	5.44%
21.0	ETRN	5.26%	AMD	5.07%
21.0	ON	5.26%	AAP	5.01%
21.0	MSFT	5.21%	INTC	5.01%
21.0	MU	5.09%	ETRN	4.89%
21.0	UAA	5.08%	ON	4.88%

All TMD: 63d

Results reflect ticker level average EDB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EDB" metric - negative performance within the expected 95%tile .

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EDB-MAE_V	Ticker_S	EDB-MAE_S
63.0	AMC	38.02%	AMC	20.71%
63.0	CYH	16.59%	MSTR	17.66%
63.0	IEP	15.07%	GME	17.47%
63.0	LUMN	15.05%	CYH	15.63%
63.0	GBTC	14.64%	LUMN	15.17%
63.0	AMAT	11.39%	BHC	14.2%
63.0	PHM	10.93%	CCL	13.88%
63.0	VNO	10.46%	GBTC	12.94%
63.0	NVDA	10.38%	GNRC	12.79%
63.0	GME	10.2%	CTLT	12.64%
63.0	CCL	10.16%	IEP	12.19%
63.0	X	10.15%	UAA	11.46%
63.0	CTLT	9.82%	LNC	10.67%
63.0	MU	9.79%	TSLA	10.65%
63.0	ELAN	9.61%	CZR	10.32%
63.0	AVGO	9.48%	GT	10.25%
63.0	LNC	9.45%	INTC	10.23%
63.0	UAA	9.33%	SIVBQ	9.95%
63.0	INTC	9.2%	NFLX	9.82%
63.0	GT	9.17%	AA	9.41%
63.0	TSLA	9.15%	CLF	9.23%
63.0	SIVBQ	9.14%	NWL	9.19%
63.0	THC	8.9%	ON	8.95%
63.0	NWL	8.85%	AMZN	8.95%
63.0	BHC	8.76%	X	8.7%
63.0	MSFT	8.74%	VFC	8.66%
63.0	CZR	8.74%	THC	8.51%
63.0	MOS	8.5%	VNO	8.49%
63.0	ON	8.46%	ZION	8.49%
63.0	PWR	8.26%	SBNY	8.42%

All TMD: 126d

Results reflect ticker level average EDB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EDB" metric - negative performance within the expected 95%tile .

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EDB-MAE_V	Ticker_S	EDB-MAE_S
126.0	AMC	37.33%	AMC	22.36%
126.0	CYH	27.56%	BHC	21.12%
126.0	LUMN	25.51%	GNRC	21.07%
126.0	IEP	22.49%	CYH	20.88%
126.0	NFLX	20.75%	MSTR	20.26%
126.0	AVGO	20.4%	LUMN	19.81%
126.0	GBTC	18.83%	CCL	18.1%
126.0	SIVBQ	18.52%	NVDA	16.96%
126.0	AMAT	16.09%	NFLX	16.37%
126.0	ETRN	15.25%	UAA	16.35%
126.0	LNC	15.23%	IEP	16.33%
126.0	PWR	15.16%	EXPE	15.44%
126.0	VNO	15.09%	SBNY	15.33%
126.0	TSLA	14.87%	GT	15.18%
126.0	ELAN	14.63%	ETRN	15.13%
126.0	INTC	13.77%	CZR	15.03%
126.0	CSTM	13.57%	SIVBQ	14.87%
126.0	NVDA	13.36%	LNC	14.63%
126.0	NWL	13.07%	GME	14.58%
126.0	GME	12.91%	KEY	14.44%
126.0	MU	12.67%	GBTC	14.41%
126.0	UAA	12.58%	AVGO	14.32%
126.0	META	12.53%	CTLT	14.12%
126.0	CMG	12.51%	AA	13.6%
126.0	BHC	12.2%	AAP	13.08%
126.0	EXPE	12.15%	VFC	13.01%
126.0	AZO	12.13%	CLF	12.67%
126.0	PHM	12.12%	ZION	12.42%
126.0	CLF	11.8%	NWL	12.13%
126.0	CCL	11.34%	CMA	12.09%

All TMD: 252d

Results reflect ticker level average EDB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EDB" metric - negative performance within the expected 95%tile .

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EDB-MAE_V	Ticker_S	EDB-MAE_S
252.0	AMC	41.17%	SBNY	53.5%
252.0	CYH	37.75%	AMC	28.89%
252.0	NVDA	36.82%	BHC	25.71%
252.0	PHM	35.26%	LUMN	25.71%
252.0	LUMN	32.64%	SIVBQ	23.37%
252.0	LNC	26.78%	CTLT	22.33%
252.0	SIVBQ	24.89%	META	21.72%
252.0	AMAT	24.36%	TSLA	21.64%
252.0	CPRT	20.85%	LNC	21.62%
252.0	CCL	20.37%	NVDA	21.3%
252.0	ELAN	20.13%	CLF	21.16%
252.0	GBTC	20.03%	TEVA	20.96%
252.0	AZO	19.46%	EXPE	20.7%
252.0	VFC	18.97%	UAA	20.51%
252.0	NWL	18.95%	VNO	19.62%
252.0	IEP	18.79%	GNRC	19.52%
252.0	PWR	18.57%	ELAN	19.28%
252.0	EXPE	18.27%	VFC	19.22%
252.0	TXN	18.07%	AAP	19.16%
252.0	GNRC	17.3%	NFLX	18.57%
252.0	TRGP	16.72%	CYH	18.46%
252.0	INTC	16.63%	FCX	17.79%
252.0	AA	16.55%	FIS	17.42%
252.0	ETRN	16.26%	FSUGY	17.13%
252.0	HCA	15.95%	AZO	17.06%
252.0	KEY	15.77%	INTC	16.98%
252.0	FSUGY	15.6%	NWL	16.76%
252.0	CMA	15.3%	CZR	16.67%
252.0	FIS	15.22%	PWR	16.65%
252.0	MSTR	15.14%	CSTM	16.44%

Bottom 30 Tickers By EDB MAE

All TMD: 1d

Results reflect ticker level average EDB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EDB" metric - negative performance within the expected 95%tile .

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EDB-MAE_V	Ticker_S	EDB-MAE_S
1.0	VCSH	0.08%	VCSH	0.07%
1.0	MUB	0.1%	MUB	0.09%
1.0	LQD	0.18%	HYG	0.2%
1.0	HYG	0.27%	LQD	0.23%
1.0	EMB	0.3%	EMB	0.26%
1.0	FRA	0.36%	FRA	0.29%
1.0	TLT	0.43%	GLD	0.31%
1.0	VZ	0.49%	PEP	0.38%
1.0	AMGN	0.49%	TLT	0.39%
1.0	SNY	0.49%	SPY	0.41%
1.0	NVS	0.49%	NVS	0.43%
1.0	PEP	0.5%	POST	0.44%
1.0	GILD	0.51%	ABBV	0.46%
1.0	CHTR	0.52%	MRK	0.47%
1.0	GSK	0.52%	BMY	0.47%
1.0	POST	0.53%	AMGN	0.48%
1.0	BMY	0.54%	HON	0.48%
1.0	GLD	0.55%	KHC	0.49%
1.0	HD	0.55%	ORLY	0.5%
1.0	SBUX	0.55%	AZN	0.51%
1.0	BUD	0.56%	TMUS	0.51%
1.0	ABBV	0.58%	CSCO	0.51%
1.0	HON	0.59%	VZ	0.52%
1.0	XOM	0.59%	MNST	0.52%
1.0	JAZZ	0.6%	COST	0.52%
1.0	ZTS	0.6%	MSI	0.52%
1.0	BALL	0.6%	GILD	0.52%
1.0	ORLY	0.61%	VICI	0.53%
1.0	CMCSA	0.61%	CAH	0.53%
1.0	SLV	0.61%	UNH	0.54%

All TMD: 10d

Results reflect ticker level average EDB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EDB" metric - negative performance within the expected 95%tile .

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EDB-MAE_V	Ticker_S	EDB-MAE_S
10.0	VCSH	0.22%	VCSH	0.24%
10.0	MUB	0.41%	MUB	0.32%
10.0	HYG	0.63%	HYG	0.66%
10.0	LQD	0.67%	LQD	0.7%
10.0	EMB	0.9%	EMB	0.78%
10.0	FRA	1.02%	GLD	0.95%
10.0	TLT	1.14%	FRA	0.96%
10.0	GLD	1.27%	TLT	1.25%
10.0	NVS	1.43%	SPY	1.3%
10.0	SNY	1.44%	PEP	1.34%
10.0	GILD	1.45%	POST	1.39%
10.0	BMY	1.46%	ABBV	1.42%
10.0	POST	1.5%	NVS	1.44%
10.0	BUD	1.54%	ORLY	1.48%
10.0	GSK	1.57%	BMY	1.5%
10.0	CHTR	1.59%	HON	1.51%
10.0	ZTS	1.6%	MRK	1.52%
10.0	VZ	1.6%	KHC	1.57%
10.0	PEP	1.6%	TMUS	1.58%
10.0	TMUS	1.62%	UNH	1.58%
10.0	XOM	1.66%	GILD	1.58%
10.0	AMGN	1.73%	VICI	1.59%
10.0	ABBV	1.74%	VZ	1.61%
10.0	JAZZ	1.75%	AMGN	1.61%
10.0	SLV	1.75%	CAH	1.65%
10.0	OXY	1.81%	CSCO	1.65%
10.0	KHC	1.84%	GSK	1.66%
10.0	MSI	1.84%	PCG	1.66%
10.0	TDG	1.84%	COST	1.68%
10.0	VICI	1.84%	AZO	1.68%

All TMD: 21d

Results reflect ticker level average EDB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EDB" metric - negative performance within the expected 95%tile .

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EDB-MAE_V	Ticker_S	EDB-MAE_S
21.0	VCSH	0.28%	VCSH	0.35%
21.0	MUB	0.72%	MUB	0.48%
21.0	HYG	0.94%	HYG	0.91%
21.0	LQD	0.97%	LQD	1.06%
21.0	EMB	1.47%	EMB	1.26%
21.0	FRA	1.58%	FRA	1.46%
21.0	GLD	1.64%	GLD	1.47%
21.0	TLT	1.8%	PEP	1.91%
21.0	GILD	1.95%	SPY	1.92%
21.0	SNY	1.96%	BMY	2.02%
21.0	BUD	1.98%	TLT	2.04%
21.0	NVS	2.04%	NVS	2.04%
21.0	GSK	2.08%	MRK	2.06%
21.0	BMY	2.08%	POST	2.1%
21.0	POST	2.14%	HON	2.18%
21.0	CHTR	2.19%	VICI	2.2%
21.0	PEP	2.23%	ACGL	2.22%
21.0	MSI	2.28%	TMUS	2.25%
21.0	CVS	2.31%	AMGN	2.26%
21.0	VICI	2.32%	UNH	2.28%
21.0	BIIB	2.34%	ORLY	2.3%
21.0	ZTS	2.34%	MSI	2.31%
21.0	XOM	2.35%	GILD	2.33%
21.0	TMUS	2.37%	MNST	2.33%
21.0	MRK	2.38%	ABBV	2.38%
21.0	HON	2.38%	CAH	2.4%
21.0	JAZZ	2.48%	BUD	2.42%
21.0	AMGN	2.48%	KHC	2.42%
21.0	GWW	2.51%	SNY	2.45%
21.0	SLV	2.54%	GWW	2.46%

All TMD: 63d

Results reflect ticker level average EDB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EDB" metric - negative performance within the expected 95%tile .

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EDB-MAE_V	Ticker_S	EDB-MAE_S
63.0	VCSH	0.41%	VCSH	0.63%
63.0	MUB	0.92%	MUB	0.71%
63.0	LQD	1.21%	LQD	1.79%
63.0	HYG	1.65%	HYG	1.95%
63.0	EMB	2.28%	EMB	2.29%
63.0	TLT	2.42%	GLD	2.36%
63.0	FRA	2.51%	FRA	2.57%
63.0	POST	2.57%	PEP	3.0%
63.0	GLD	2.72%	ABBV	3.22%
63.0	GSK	2.87%	SPY	3.31%
63.0	TMUS	2.89%	TLT	3.31%
63.0	ABBV	3.21%	POST	3.32%
63.0	VICI	3.22%	BMY	3.35%
63.0	CHTR	3.23%	HON	3.39%
63.0	GILD	3.3%	VICI	3.45%
63.0	BUD	3.31%	NVS	3.47%
63.0	PEP	3.44%	GILD	3.73%
63.0	HON	3.57%	VZ	3.74%
63.0	NVS	3.57%	BUD	3.74%
63.0	SPY	3.59%	MRK	3.76%
63.0	BMY	3.62%	CPRT	3.81%
63.0	CAH	3.69%	ORLY	3.86%
63.0	OXY	3.69%	ACGL	3.89%
63.0	MSI	3.7%	HD	3.94%
63.0	ORLY	3.76%	MNST	3.97%
63.0	HD	3.81%	CAH	4.01%
63.0	COST	3.84%	AMGN	4.11%
63.0	SBNY	3.89%	JAZZ	4.15%
63.0	MRK	3.94%	AZN	4.16%
63.0	XOM	3.97%	KHC	4.17%

All TMD: 126d

Results reflect ticker level average EDB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EDB" metric - negative performance within the expected 95%tile .

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EDB-MAE_V	Ticker_S	EDB-MAE_S
126.0	VCSH	0.67%	VCSH	0.92%
126.0	MUB	1.7%	MUB	1.28%
126.0	HYG	2.14%	LQD	2.66%
126.0	LQD	2.14%	HYG	3.05%
126.0	NVS	2.76%	EMB	3.85%
126.0	FRA	3.11%	UNH	3.95%
126.0	TLT	3.26%	CAH	3.99%
126.0	VST	3.54%	NVS	4.08%
126.0	HON	3.58%	FRA	4.19%
126.0	SNY	3.84%	PEP	4.24%
126.0	ZTS	3.85%	GLD	4.4%
126.0	GSK	4.21%	KHC	4.43%
126.0	TMUS	4.28%	TLT	4.77%
126.0	HD	4.29%	MNST	4.79%
126.0	BUD	4.36%	GILD	4.87%
126.0	GLD	4.46%	HON	5.33%
126.0	KHC	4.5%	CMCSA	5.37%
126.0	GILD	4.54%	FRCB	5.39%
126.0	OXY	4.64%	VICI	5.4%
126.0	COST	4.65%	CSCO	5.44%
126.0	EMB	4.68%	ABBV	5.46%
126.0	AZN	4.82%	MRK	5.51%
126.0	CMCSA	4.84%	POST	5.57%
126.0	GS	4.84%	JAZZ	5.57%
126.0	BHP	4.85%	LLY	5.66%
126.0	VICI	4.93%	AMGN	5.72%
126.0	PEP	5.08%	SPY	5.72%
126.0	CHTR	5.12%	AZN	5.79%
126.0	SBUX	5.16%	GS	5.79%
126.0	POST	5.17%	ZTS	5.8%

All TMD: 252d

Results reflect ticker level average EDB MAE across all model dates for which actual results for the stated horizon are known and for which the actual results fit the contingencies of the "EDB" metric - negative performance within the expected 95%tile .

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	EDB-MAE_V	Ticker_S	EDB-MAE_S
252.0	VCSH	1.04%	VCSH	1.12%
252.0	LQD	2.83%	MUB	1.77%
252.0	MUB	3.14%	HYG	3.63%
252.0	QQQ	3.42%	SPY	4.08%
252.0	HYG	3.44%	FRA	4.28%
252.0	XOM	3.89%	LQD	4.34%
252.0	ISRG	3.93%	QQQ	4.57%
252.0	GLD	4.02%	TLT	4.59%
252.0	FRA	4.3%	PEP	4.84%
252.0	ZTS	4.3%	EMB	4.99%
252.0	GILD	4.47%	GLD	5.17%
252.0	VICI	4.51%	CDNS	5.49%
252.0	BHP	4.55%	GILD	5.64%
252.0	TLT	4.67%	MNST	5.64%
252.0	COST	4.86%	JAZZ	6.1%
252.0	SPY	4.89%	CMCSA	6.42%
252.0	KHC	5.17%	FRCB	6.47%
252.0	SNY	5.18%	COST	6.88%
252.0	META	5.28%	VICI	6.99%
252.0	OXY	5.29%	LEN	7.18%
252.0	CHTR	5.4%	CMG	7.19%
252.0	NVS	5.41%	ISRG	7.24%
252.0	CNC	5.43%	KHC	7.41%
252.0	T	5.68%	AMGN	7.42%
252.0	PEP	6.2%	CNC	7.43%
252.0	CMCSA	6.35%	ABBV	7.6%
252.0	BUD	6.46%	CVS	7.73%
252.0	QCOM	6.68%	BMY	7.74%
252.0	POST	6.72%	GSK	7.9%
252.0	GOLD	6.79%	MSFT	7.99%

Performance Summary - Returns on EDB based exposures (ROEDB)

Here we compare ROEDB, or price return performance of ticker-model date (TMD) exposures based upon EDB, for Vector Mdel EDB to the Sigma Model's EDB ("S", presented with light shading).

Vector Model EDB is denoted by a "V" and presented with dark shading in the bar charts comparison of EDB that follow, whereas Sigma EDB is denoted by "S" and presented with light shading.

Sigma based ticker exposure performance reflects equal TMD weighting and the price returns of the underlying TMD for the given horizon.

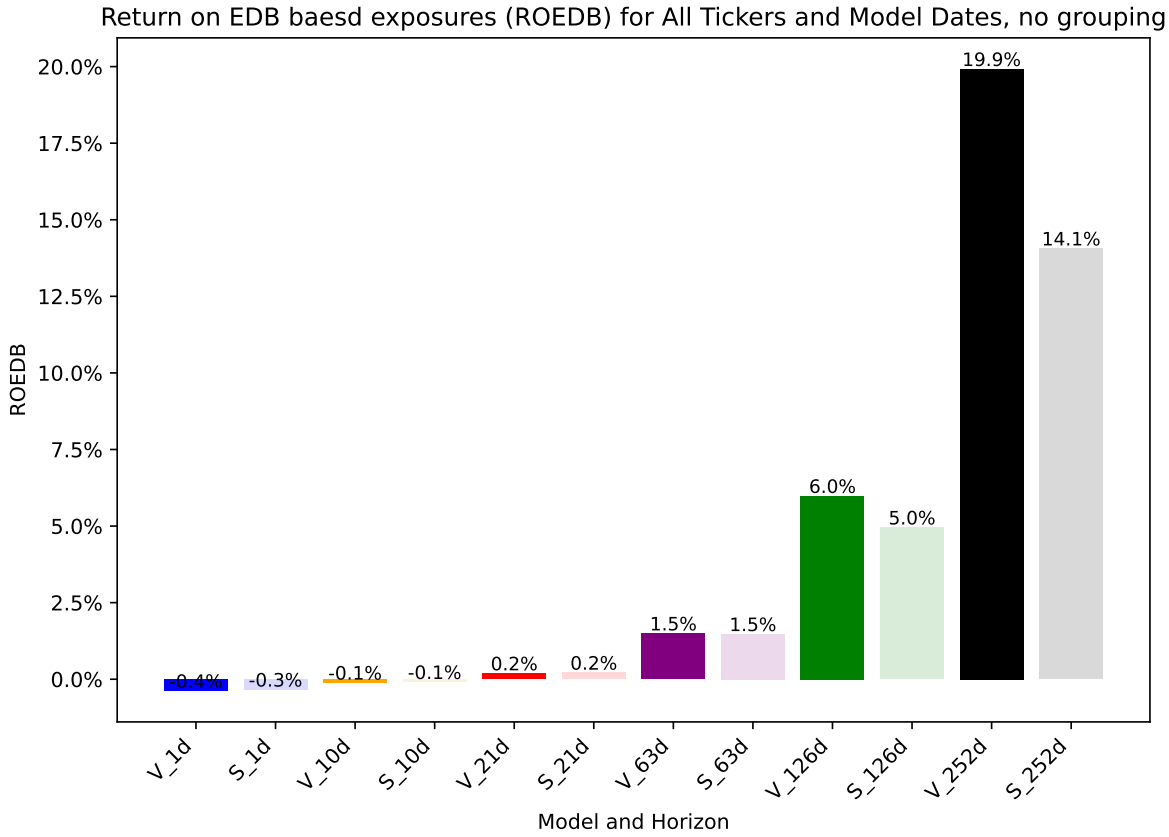
Vector Model based TMD exposures reflect each TMD's underlying horizon price return multiplied by the ratio of Sigma model based EDB to Vector Model EDB for the given horizon. This ratio is capped of 3.0x and floored of 0.333x.

Following each bar chart comparison of ROEDB is a table detailing the alpha (intercept) and slope (beta) of Vector Model EDB based exposure performance to Sigma EDB exposure based performance. The beta arguably provides some indication of the leverage of the Vector Model based exposures and the alpha is an indication of Vector Model EDB's ability to generate performance indepdendent of the ticker's returns.

Note that time horizons are denominated in trading days, where 10d is ~ 2 weeks in calendar terms, 21d is ~ 1 month, 63d is ~ 1 quarter, 126d is ~ half year, 252d is ~1 year. Model estimates for all horizons are made on each Model Date, so p-Values for horizons beyond 1d are not valid.

All Out of Sample Model Dates

Period examined: All model dates from 2022-01-31 through 2025-03-28



Alpha (intercept) and Beta (slope) of Vector Model ROEDB regressed upon corresponding horizon actual ticker-model date returns:

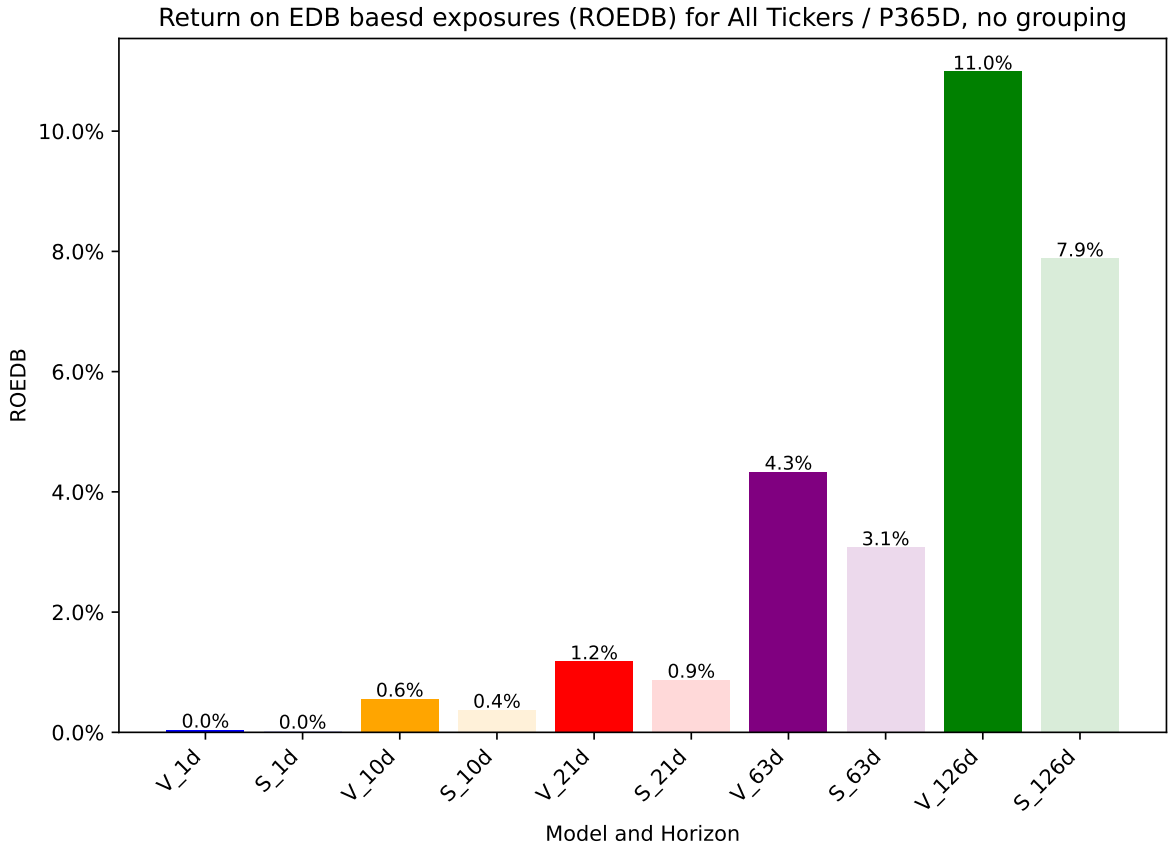
	1d	10d	21d	63d	126d	252d
intercept	0.03%	0.02%	-0.14%	-0.79%	-1.73%	-2.98%
intercept_p_value	6.54%	41.04%	0.00%	0.00%	0.00%	0.00%
slope	121.78%	145.98%	153.19%	155.12%	155.72%	162.81%
slope_p_value	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Same as above, but averaged by Ticker across Model Dates:

	1d	10d	21d	63d	126d	252d
intercept	0.01%	0.07%	0.17%	0.62%	1.40%	2.29%
intercept_p_value	50.59%	21.15%	14.78%	11.81%	9.84%	12.62%
slope	151.08%	143.24%	144.41%	145.21%	149.46%	162.75%
slope_p_value	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Prior 365 Calendar Days (P365D)

Period examined: All model dates from 2024-04-02 through 2025-03-28



Alpha (intercept) and Beta (slope) of Vector Model ROEDB regressed upon corresponding horizon actual ticker-model date returns:

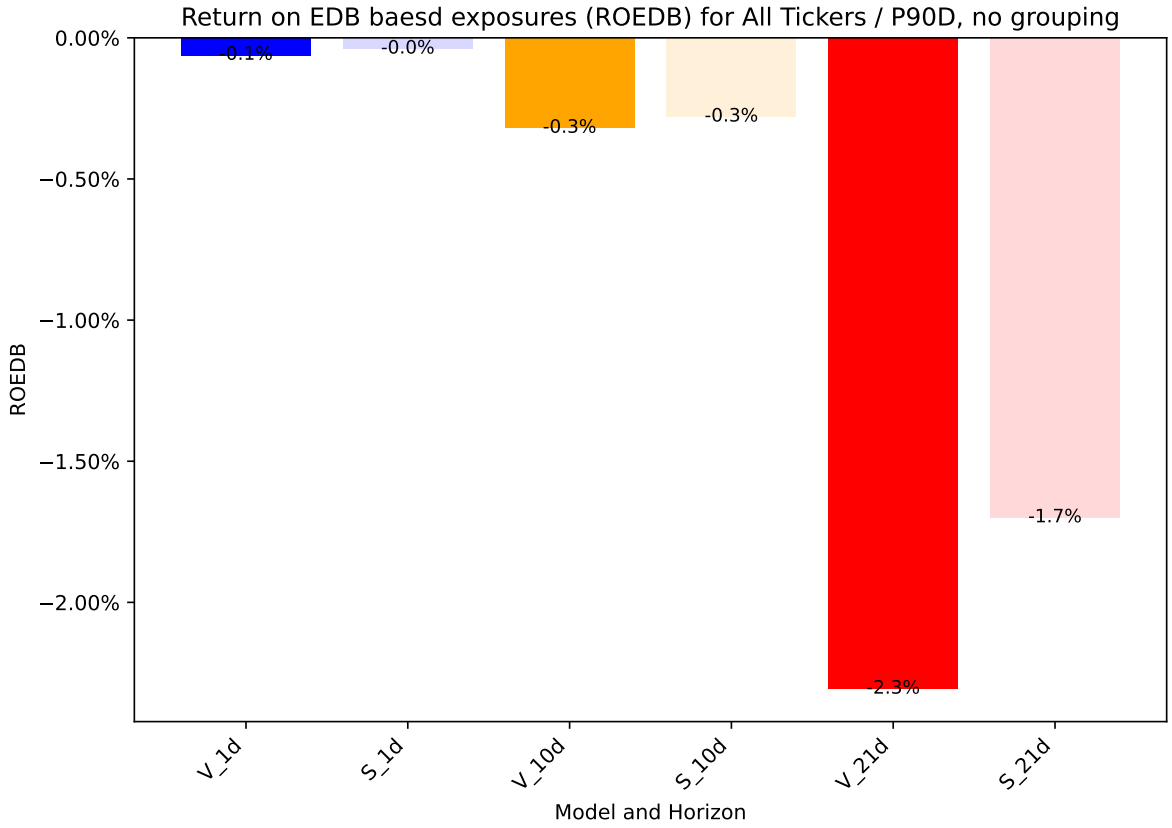
	1d	10d	21d	63d	126d
intercept	0.00%	0.00%	-0.13%	-0.01%	0.14%
intercept_p_value	79.31%	94.31%	1.22%	93.41%	36.96%
slope	150.55%	148.78%	150.32%	141.09%	137.61%
slope_p_value	0.00%	0.00%	0.00%	0.00%	0.00%

Same as above, but averaged by Ticker across Model Dates:

	1d	10d	21d	63d	126d
intercept	0.01%	0.10%	0.04%	0.36%	-0.14%
intercept_p_value	49.06%	22.73%	16.96%	18.25%	20.24%
slope	133.74%	122.94%	121.81%	123.37%	126.53%
slope_p_value	0.00%	0.00%	0.00%	0.00%	0.00%

Prior 90 Calendar Days (P90D)

Period examined: All model dates from 2025-01-02 through 2025-03-28



Alpha (intercept) and Beta (slope) of Vector Model ROEDB regressed upon corresponding horizon actual ticker-model date returns:

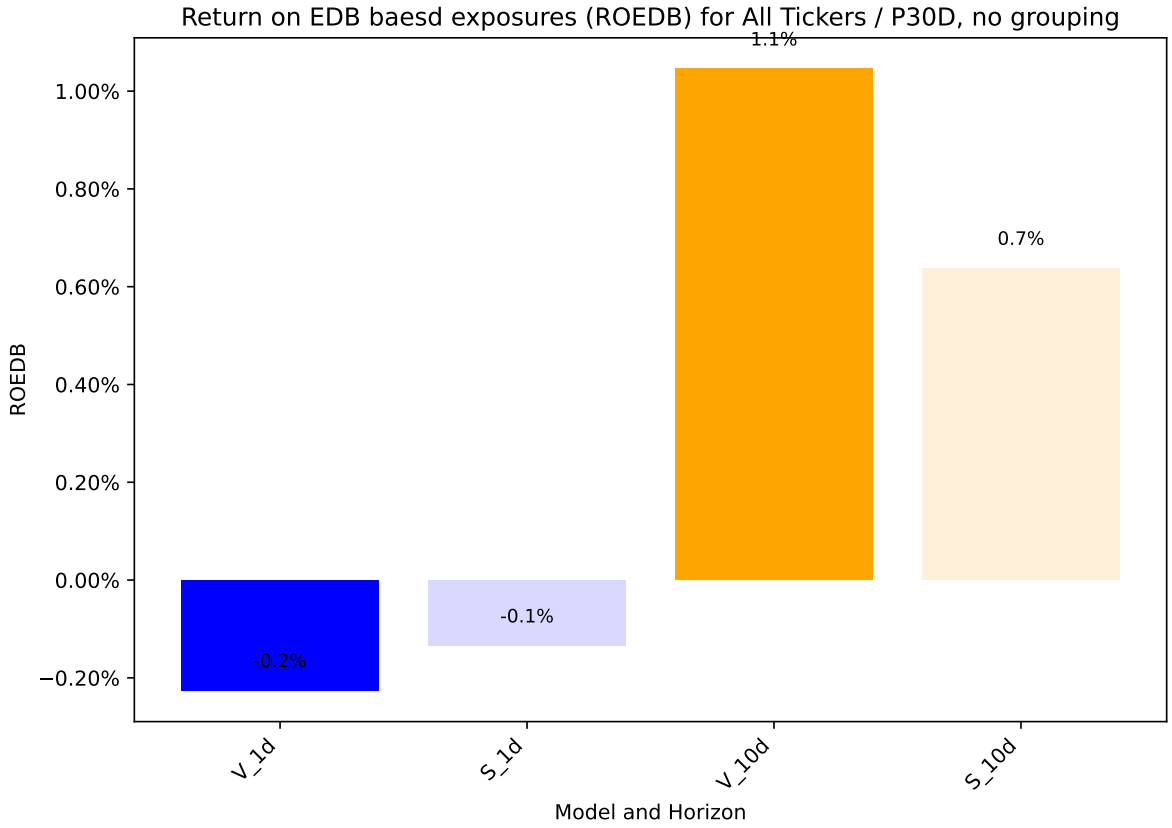
	1d	10d	21d
intercept	0.00%	0.09%	0.16%
intercept_p_value	91.95%	17.59%	10.70%
slope	161.94%	146.54%	145.15%
slope_p_value	0.00%	0.00%	0.00%

Same as above, but averaged by Ticker across Model Dates:

	1d	10d	21d
intercept	0.00%	0.05%	0.01%
intercept_p_value	52.99%	32.39%	32.03%
slope	148.93%	135.84%	133.49%
slope_p_value	0.00%	0.00%	0.00%

Prior 30 Calendar Days (P30D)

Period examined: All model dates from 2025-03-03 through 2025-03-28



Alpha (intercept) and Beta (slope) of Vector Model ROEDB regressed upon corresponding horizon actual ticker-model date returns:

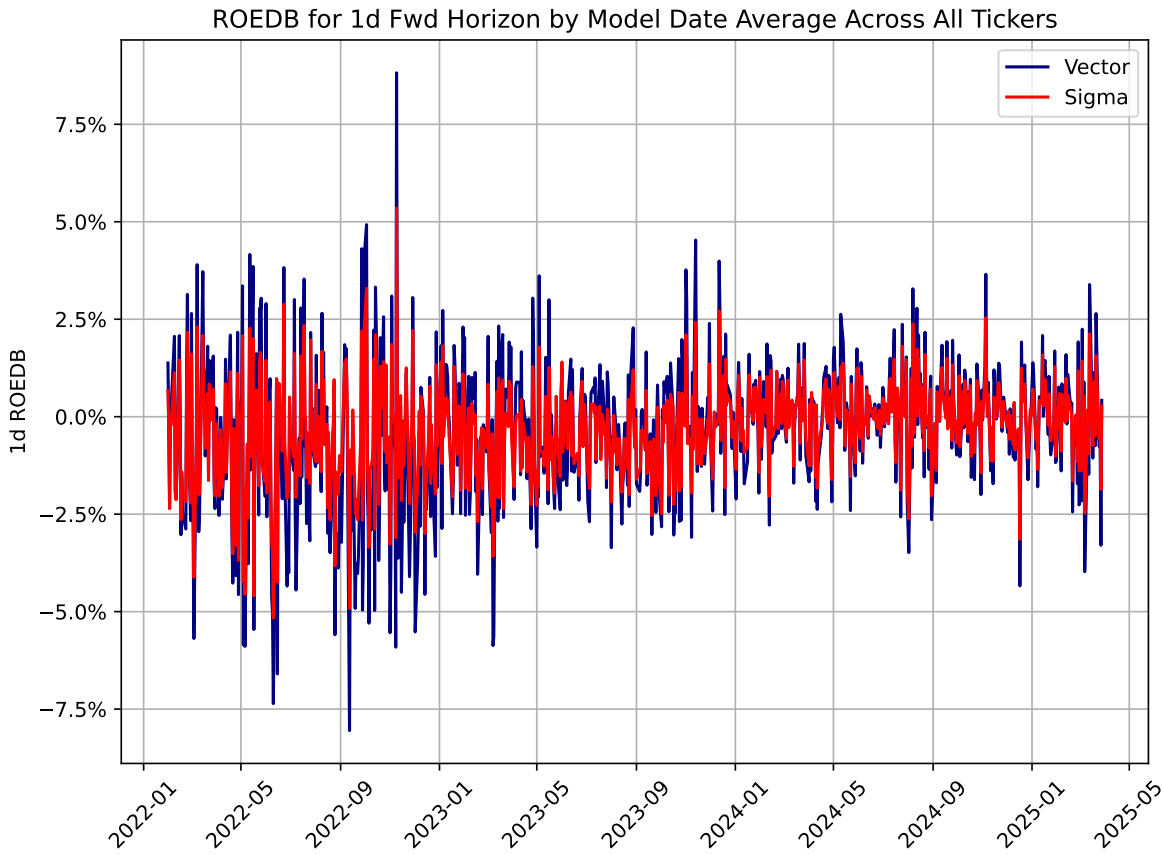
	1d	10d
intercept	0.01%	0.10%
intercept_p_value	87.30%	35.83%
slope	172.61%	147.54%
slope_p_value	0.00%	0.00%

Same as above, but averaged by Ticker across Model Dates:

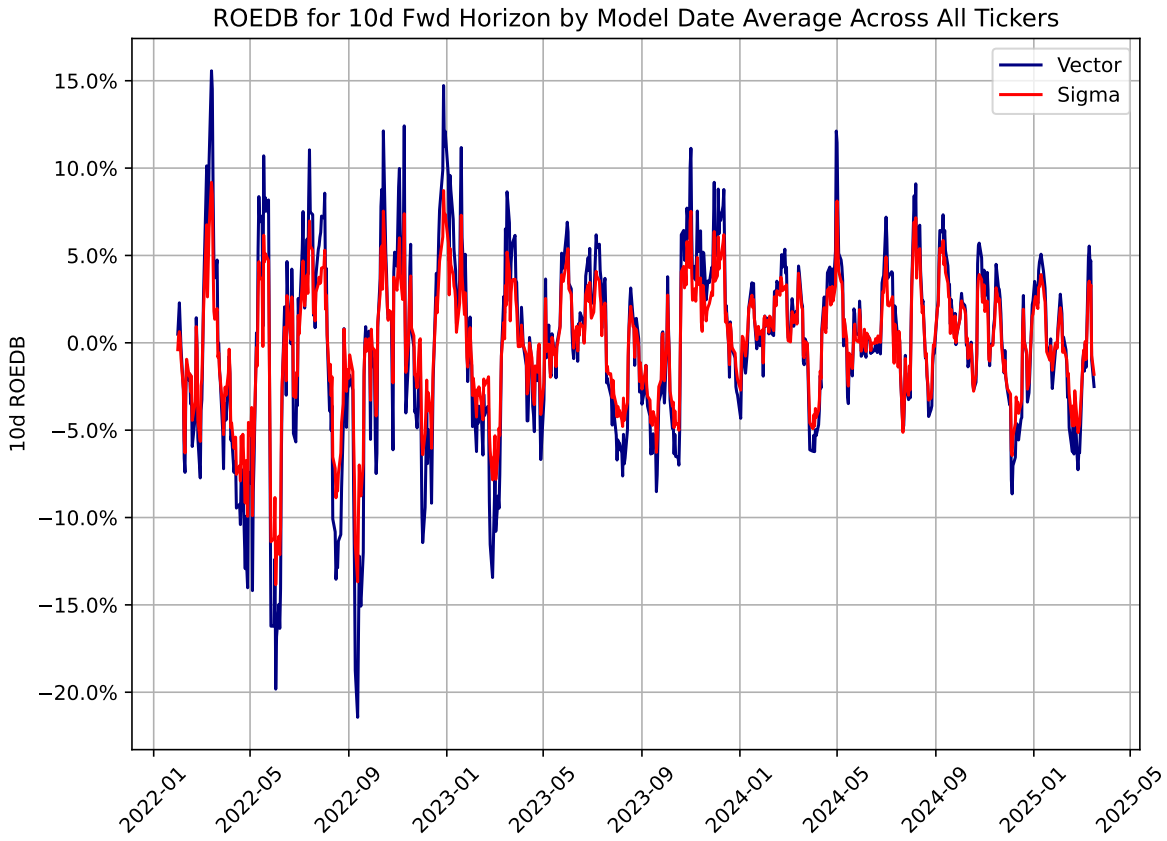
	1d	10d
intercept	0.00%	-0.10%
intercept_p_value	43.45%	41.60%
slope	159.31%	142.71%
slope_p_value	0.00%	0.02%

ROEDB by Model Date Detail

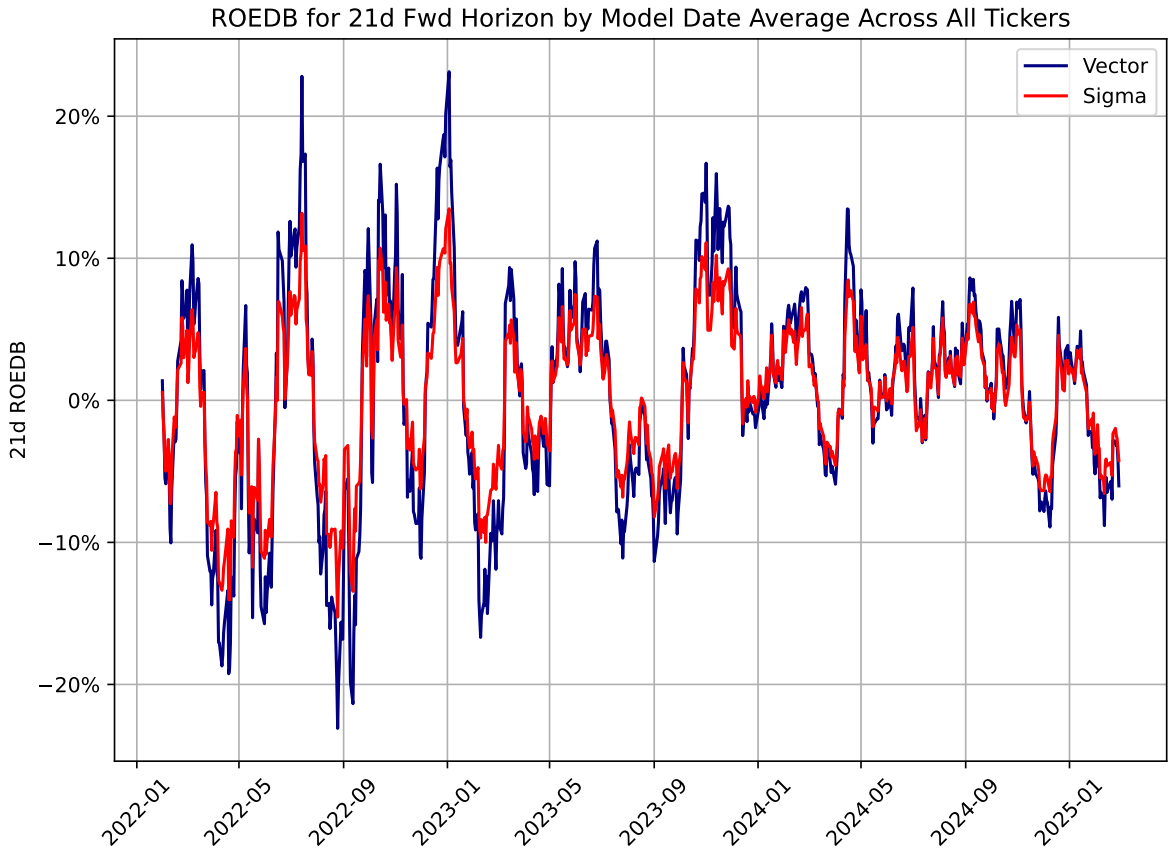
1d Horizon



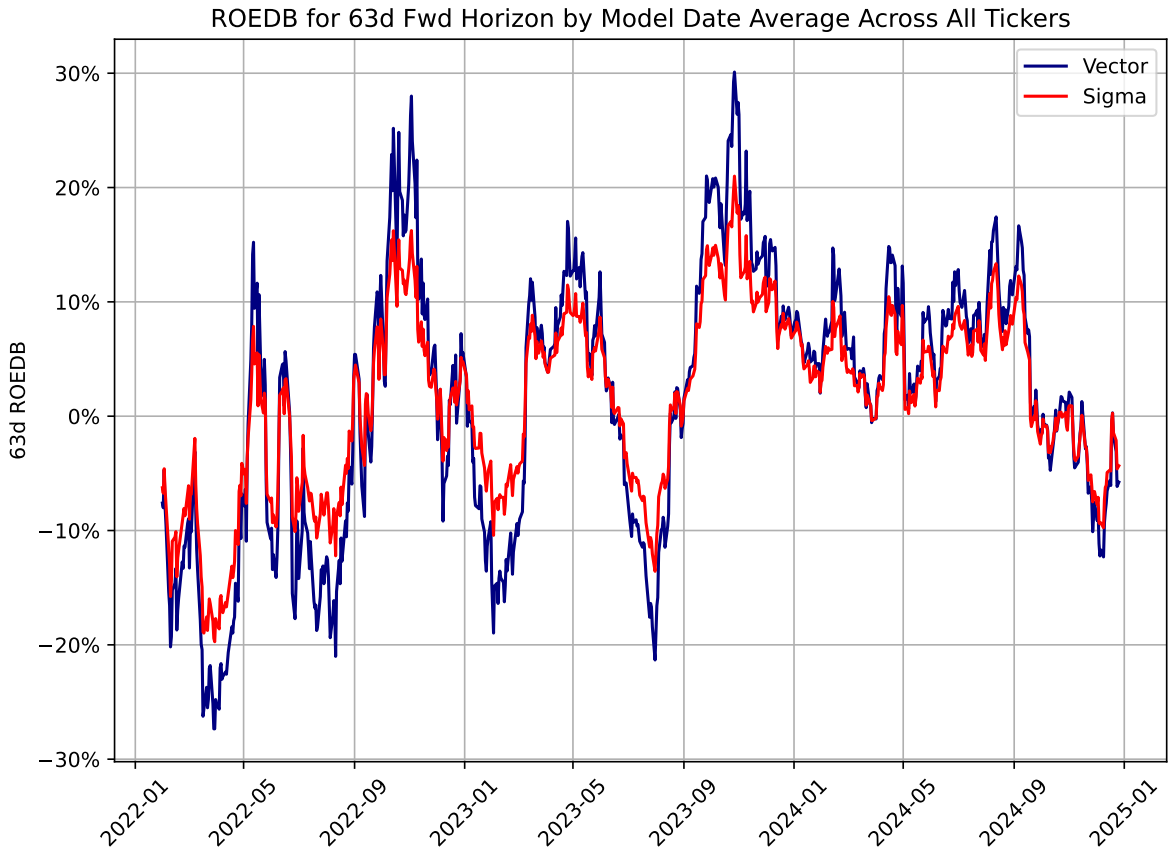
10d Horizon


ROEDB for 10d Fwd Horizon by Model Date Average Across All Tickers
Vector
Sigma
10d ROEDB
15.0%
10.0%
5.0%
0.0%
−5.0%
−10.0%
−15.0%
−20.0%
2022-01
2022-05
2022-09
2023-01
2023-05
2023-09
2024-01
2024-05
2024-09
2025-01
2025-05

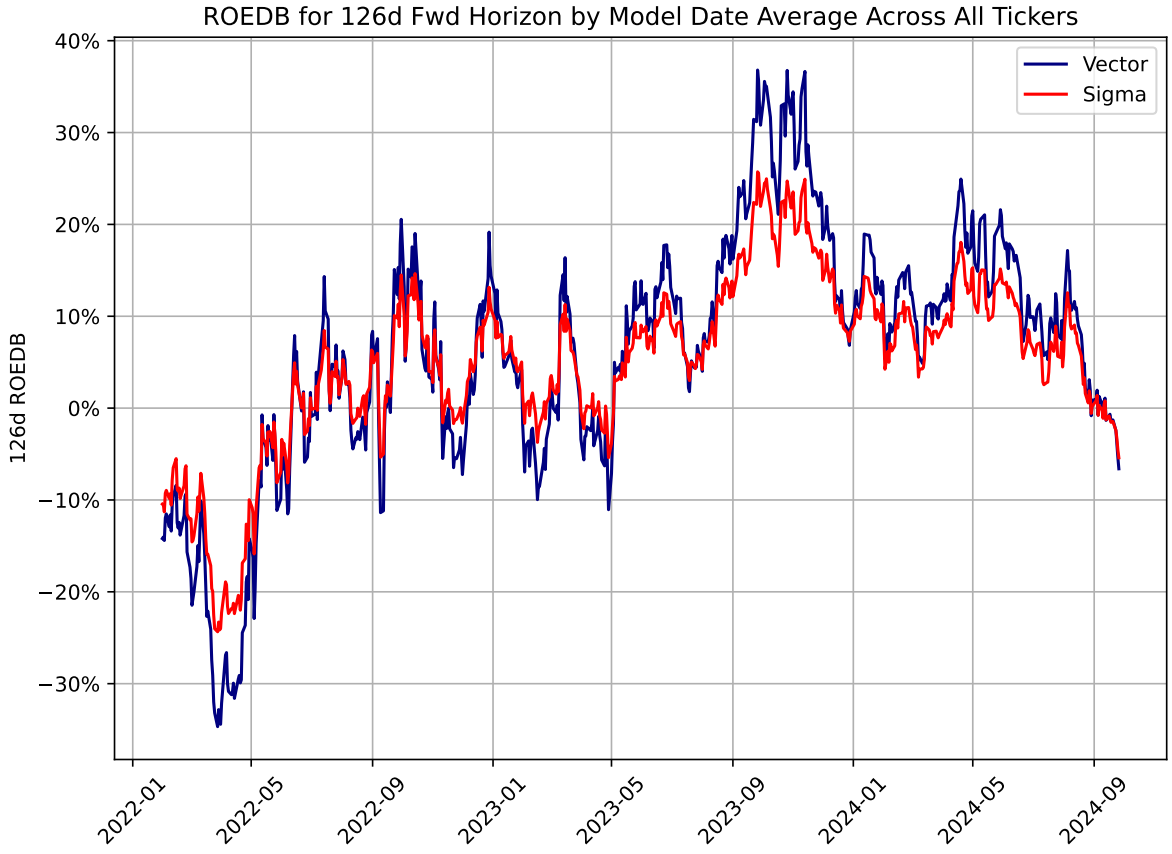
21d Horizon


ROEDB for 21d Fwd Horizon by Model Date Average Across All Tickers
Vector
Sigma
21d ROEDB
20%
10%
0%
−10%
−20%
2022-01
2022-05
2022-09
2023-01
2023-05
2023-09
2024-01
2024-05
2024-09
2025-01

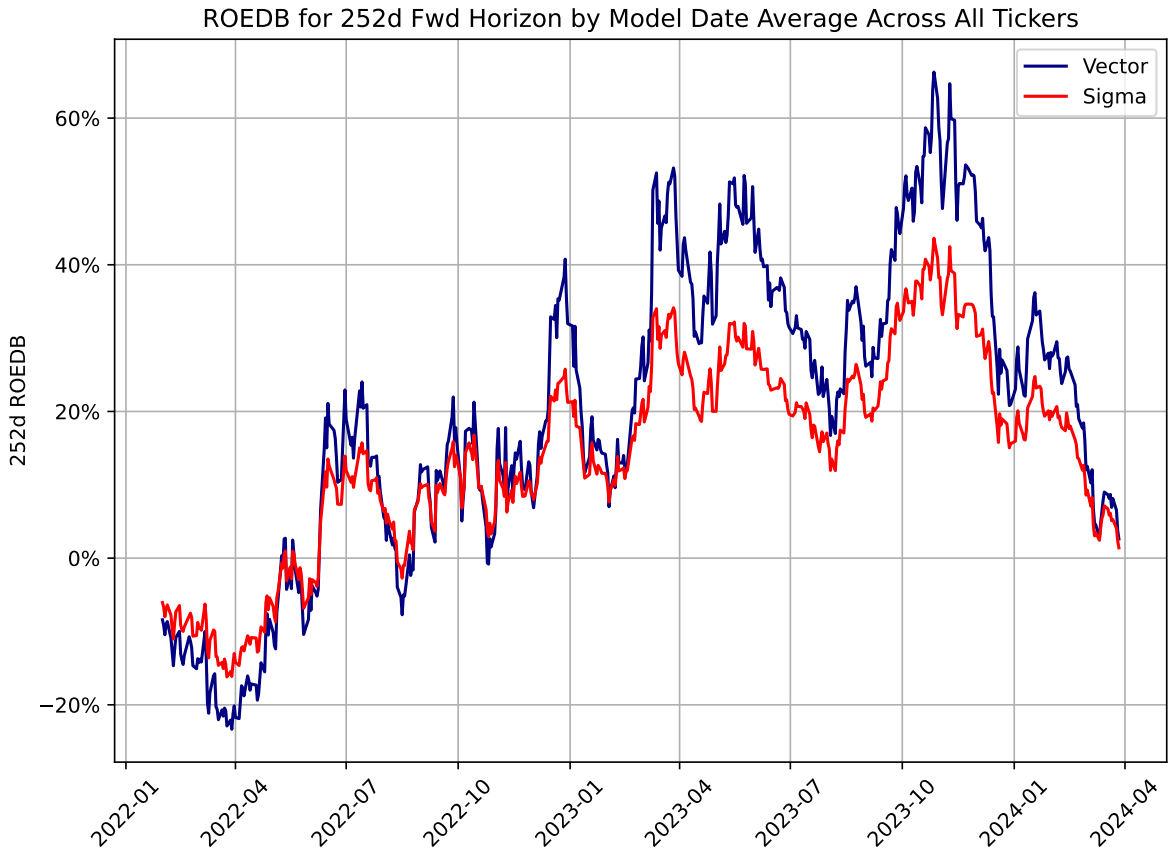
63d Horizon


ROEDB for 63d Fwd Horizon by Model Date Average Across All Tickers
Vector
Sigma
63d ROEDB
30%
20%
10%
0%
−10%
−20%
−30%
2022-01
2022-05
2022-09
2023-01
2023-05
2023-09
2024-01
2024-05
2024-09
2025-01

126d Horizon



252d Horizon



Top 30 Tickers By ROEDB

All TMD: 1d

Results reflect ticker level average ROEDB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEDB_V	Ticker_S	ROEDB_S
1.0	MSTR	0.99%	MSTR	0.45%
1.0	GME	0.66%	VST	0.26%
1.0	NFLX	0.42%	NVDA	0.25%
1.0	META	0.31%	GBTC	0.2%
1.0	XOM	0.23%	GME	0.2%
1.0	ORLY	0.2%	TRGP	0.17%
1.0	GWW	0.19%	LLY	0.17%
1.0	ORCL	0.18%	GE	0.15%
1.0	MSI	0.18%	NFLX	0.14%
1.0	VST	0.18%	X	0.14%
1.0	AAPL	0.18%	PWR	0.14%
1.0	NVDA	0.17%	CAH	0.13%
1.0	AZO	0.16%	TMUS	0.12%
1.0	INTU	0.16%	META	0.12%
1.0	LLY	0.15%	THC	0.12%
1.0	TRGP	0.15%	ETRN	0.12%
1.0	ISRG	0.15%	TDG	0.12%
1.0	CAH	0.14%	TEVA	0.11%
1.0	JPM	0.14%	ORLY	0.11%
1.0	CDNS	0.13%	PHM	0.11%
1.0	TDG	0.13%	ACGL	0.11%
1.0	SLV	0.13%	GWW	0.1%
1.0	X	0.13%	IRM	0.1%
1.0	CMG	0.13%	AZO	0.09%
1.0	GOOGL	0.12%	ISRG	0.09%
1.0	AMD	0.12%	ORCL	0.09%
1.0	AMZN	0.12%	COST	0.09%
1.0	CPRT	0.12%	MSI	0.09%
1.0	IRM	0.12%	CDNS	0.09%
1.0	ETRN	0.12%	CMG	0.09%

All TMD: 10d

Results reflect ticker level average ROEDB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEDB_V	Ticker_S	ROEDB_S
10.0	MSTR	11.03%	MSTR	4.75%
10.0	GME	5.66%	VST	2.71%
10.0	NFLX	3.48%	NVDA	2.56%
10.0	META	3.42%	GBTC	1.94%
10.0	VST	2.32%	GME	1.77%
10.0	TEVA	2.27%	LLY	1.77%
10.0	NVDA	1.99%	TRGP	1.71%
10.0	ORCL	1.85%	NFLX	1.55%
10.0	GWW	1.72%	META	1.5%
10.0	SLV	1.62%	GE	1.46%
10.0	XOM	1.56%	PWR	1.41%
10.0	CAH	1.56%	ETRN	1.41%
10.0	LLY	1.54%	X	1.34%
10.0	MSI	1.48%	CAH	1.32%
10.0	GILD	1.42%	TEVA	1.26%
10.0	GE	1.4%	TDG	1.13%
10.0	ETRN	1.4%	PHM	1.12%
10.0	AAPL	1.4%	TMUS	1.09%
10.0	AZO	1.38%	ORLY	1.05%
10.0	ORLY	1.32%	THC	1.05%
10.0	TMUS	1.3%	GWW	1.04%
10.0	AMZN	1.24%	IRM	1.02%
10.0	TRGP	1.24%	ACGL	0.99%
10.0	ISRG	1.21%	ORCL	0.98%
10.0	OXY	1.2%	CDNS	0.93%
10.0	X	1.17%	ISRG	0.92%
10.0	HCA	1.13%	AZO	0.89%
10.0	GBTC	1.09%	MSI	0.88%
10.0	CDNS	1.07%	COST	0.86%
10.0	THC	1.06%	CMG	0.83%

All TMD: 21d

Results reflect ticker level average ROEDB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEDB_V	Ticker_S	ROEDB_S
21.0	MSTR	23.65%	MSTR	10.55%
21.0	GME	8.91%	VST	5.82%
21.0	META	8.15%	NVDA	5.59%
21.0	NFLX	7.02%	GBTC	4.28%
21.0	TEVA	5.63%	LLY	3.79%
21.0	VST	4.68%	ETRN	3.5%
21.0	NVDA	4.25%	TRGP	3.49%
21.0	ETRN	4.25%	META	3.47%
21.0	ORCL	3.87%	NFLX	3.41%
21.0	GILD	3.58%	GE	3.17%
21.0	GWW	3.49%	PWR	2.92%
21.0	CAH	3.35%	TEVA	2.74%
21.0	XOM	3.31%	GME	2.74%
21.0	GE	3.19%	CAH	2.72%
21.0	LLY	3.16%	X	2.63%
21.0	SLV	3.12%	PHM	2.47%
21.0	MSI	3.04%	TDG	2.33%
21.0	GBTC	2.89%	GWW	2.28%
21.0	AZO	2.79%	TMUS	2.26%
21.0	CTLT	2.74%	ORCL	2.22%
21.0	ORLY	2.69%	ORLY	2.17%
21.0	TMUS	2.69%	THC	2.14%
21.0	TRGP	2.68%	IRM	2.14%
21.0	AMZN	2.64%	ACGL	2.09%
21.0	AMGN	2.54%	ISRG	2.08%
21.0	AAPL	2.49%	COST	1.94%
21.0	ISRG	2.46%	MSI	1.93%
21.0	THC	2.36%	AZO	1.91%
21.0	INTU	2.35%	CDNS	1.85%
21.0	X	2.22%	CMG	1.83%

All TMD: 63d

Results reflect ticker level average ROEDB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEDB_V	Ticker_S	ROEDB_S
63.0	MSTR	61.34%	MSTR	31.95%
63.0	META	32.96%	VST	20.7%
63.0	NFLX	26.95%	NVDA	20.09%
63.0	VST	20.01%	GBTC	15.67%
63.0	NVDA	17.09%	META	13.09%
63.0	TEVA	13.69%	NFLX	12.09%
63.0	ORCL	12.49%	LLY	11.01%
63.0	GWW	11.69%	ETRN	10.28%
63.0	GME	11.56%	GE	10.25%
63.0	GBTC	11.52%	TRGP	10.25%
63.0	GE	10.95%	PHM	9.13%
63.0	GILD	10.85%	PWR	8.85%
63.0	ISRG	10.54%	TEVA	8.1%
63.0	ETRN	10.51%	CAH	7.85%
63.0	CTLT	10.48%	ISRG	7.37%
63.0	CAH	10.09%	ORCL	7.32%
63.0	LLY	9.97%	THC	7.22%
63.0	MSI	9.6%	GWW	7.14%
63.0	TDG	8.73%	TDG	7.13%
63.0	TRGP	8.62%	ACGL	6.64%
63.0	CDNS	8.13%	IRM	6.62%
63.0	INTU	7.54%	CCL	6.59%
63.0	THC	7.53%	CMG	6.45%
63.0	ACGL	7.37%	MSI	6.35%
63.0	PHM	7.34%	TMUS	6.17%
63.0	CMG	7.27%	DHI	6.17%
63.0	XOM	7.18%	CDNS	6.09%
63.0	TMUS	7.14%	ORLY	6.06%
63.0	GS	7.07%	CPRT	5.94%
63.0	GOOGL	6.92%	JPM	5.91%

All TMD: 126d

Results reflect ticker level average ROEDB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEDB_V	Ticker_S	ROEDB_S
126.0	MSTR	168.32%	MSTR	77.77%
126.0	META	84.6%	NVDA	54.68%
126.0	NFLX	66.73%	VST	47.38%
126.0	NVDA	53.98%	GBTC	42.11%
126.0	VST	50.47%	META	32.04%
126.0	ORCL	33.51%	NFLX	29.34%
126.0	GBTC	32.19%	GE	25.37%
126.0	TEVA	31.85%	LLY	23.64%
126.0	ISRG	29.49%	PHM	23.12%
126.0	GE	29.08%	TRGP	22.8%
126.0	GWW	25.63%	THC	20.73%
126.0	GILD	24.65%	PWR	19.92%
126.0	CAH	24.64%	ETRN	18.49%
126.0	MSI	24.16%	TEVA	18.25%
126.0	LLY	24.15%	ORCL	18.19%
126.0	TDG	23.95%	ISRG	17.49%
126.0	INTU	21.32%	TDG	17.12%
126.0	THC	20.66%	IRM	17.0%
126.0	TRGP	20.52%	GWW	16.92%
126.0	CDNS	20.38%	CAH	16.65%
126.0	LEN	20.19%	ACGL	16.29%
126.0	ETRN	19.22%	DHI	15.89%
126.0	DHI	19.19%	CCL	15.64%
126.0	AMZN	18.93%	CMG	15.63%
126.0	PHM	18.63%	MSI	15.37%
126.0	GOOGL	17.77%	CPRT	13.96%
126.0	ACGL	17.6%	LEN	13.79%
126.0	AMD	17.58%	JPM	13.63%
126.0	ORLY	17.29%	CDNS	13.42%
126.0	LVS	17.04%	ORLY	13.29%

All TMD: 252d

Results reflect ticker level average ROEDB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEDB_V	Ticker_S	ROEDB_S
252.0	MSTR	497.47%	MSTR	234.65%
252.0	META	228.37%	NVDA	160.57%
252.0	VST	191.56%	VST	132.14%
252.0	NFLX	157.59%	GBTC	130.26%
252.0	NVDA	144.56%	META	87.32%
252.0	GBTC	105.29%	NFLX	67.11%
252.0	TEVA	82.95%	PHM	64.12%
252.0	ORCL	80.74%	GE	64.03%
252.0	ISRG	79.25%	LLY	61.15%
252.0	GE	75.01%	THC	55.1%
252.0	LLY	73.74%	TRGP	51.05%
252.0	TDG	72.44%	PWR	44.54%
252.0	AMZN	72.34%	TDG	44.22%
252.0	THC	67.36%	TEVA	42.93%
252.0	MSI	65.17%	DHI	41.12%
252.0	INTU	64.51%	ISRG	40.56%
252.0	LEN	60.25%	IRM	39.77%
252.0	GWW	59.12%	ACGL	39.18%
252.0	AMD	58.16%	ORCL	38.97%
252.0	WDC	57.5%	CMG	38.53%
252.0	DHI	57.15%	GWW	37.17%
252.0	PHM	57.01%	LEN	37.05%
252.0	TRGP	55.52%	AMD	35.92%
252.0	ACGL	54.61%	CCL	35.92%
252.0	COST	52.75%	ETRN	35.78%
252.0	CAH	50.73%	AMAT	35.61%
252.0	GOOGL	47.63%	CPRT	34.25%
252.0	AMAT	44.36%	MU	32.93%
252.0	IRM	44.16%	CDNS	32.86%
252.0	CMG	40.05%	MSI	32.15%

Bottom 30 Tickers By ROEDB

All TMD: 1d

Results reflect ticker level average ROEDB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEDB_V	Ticker_S	ROEDB_S
1.0	AVGO	-60.18%	AVGO	-53.02%
1.0	SIVBQ	-2.09%	SIVBQ	-0.78%
1.0	SBNY	-1.16%	SBNY	-0.45%
1.0	LUMN	-0.41%	FRCB	-0.23%
1.0	FRCB	-0.4%	IEP	-0.18%
1.0	AAP	-0.38%	AAP	-0.18%
1.0	IEP	-0.37%	AMC	-0.17%
1.0	VFC	-0.18%	VFC	-0.13%
1.0	CYH	-0.18%	LUMN	-0.11%
1.0	CHTR	-0.16%	NWL	-0.11%
1.0	AMC	-0.15%	CZR	-0.08%
1.0	CSTM	-0.15%	UAA	-0.08%
1.0	NWL	-0.15%	BHC	-0.08%
1.0	USB	-0.14%	ELAN	-0.07%
1.0	GSK	-0.13%	BALL	-0.06%
1.0	FIS	-0.12%	INTC	-0.05%
1.0	TLT	-0.12%	TLT	-0.05%
1.0	UAA	-0.11%	GT	-0.05%
1.0	ELAN	-0.1%	GNRC	-0.04%
1.0	ZION	-0.1%	BIIB	-0.04%
1.0	T	-0.1%	CYH	-0.04%
1.0	BHC	-0.08%	BXP	-0.04%
1.0	VZ	-0.08%	LNC	-0.04%
1.0	GT	-0.07%	CVS	-0.04%
1.0	EMB	-0.06%	CLF	-0.04%
1.0	ADBE	-0.05%	GSK	-0.03%
1.0	BXP	-0.05%	FIS	-0.03%
1.0	LNC	-0.05%	CHTR	-0.03%
1.0	WRK	-0.05%	TFC	-0.03%
1.0	CVS	-0.05%	CSTM	-0.03%

All TMD: 10d

Results reflect ticker level average ROEDB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEDB_V	Ticker_S	ROEDB_S
10.0	AVGO	-63.71%	AVGO	-52.78%
10.0	SBNY	-11.81%	SBNY	-4.05%
10.0	SIVBQ	-8.56%	SIVBQ	-3.9%
10.0	AMC	-4.41%	FRCB	-2.19%
10.0	FRCB	-4.1%	AAP	-1.75%
10.0	AAP	-3.59%	AMC	-1.75%
10.0	IEP	-2.43%	IEP	-1.67%
10.0	ELAN	-2.0%	VFC	-1.25%
10.0	LUMN	-1.76%	NWL	-1.1%
10.0	CHTR	-1.68%	UAA	-0.92%
10.0	VFC	-1.55%	CZR	-0.91%
10.0	NWL	-1.36%	ELAN	-0.8%
10.0	CYH	-1.32%	LUMN	-0.75%
10.0	FIS	-1.15%	CYH	-0.75%
10.0	BHC	-1.13%	BHC	-0.6%
10.0	GSK	-1.08%	BALL	-0.58%
10.0	TSLA	-1.04%	TLT	-0.5%
10.0	PRGO	-1.02%	GT	-0.49%
10.0	GT	-1.0%	BXP	-0.44%
10.0	TLT	-0.98%	INTC	-0.44%
10.0	BXP	-0.95%	LNC	-0.43%
10.0	UAA	-0.92%	GNRC	-0.43%
10.0	ZION	-0.87%	BIIB	-0.42%
10.0	LNC	-0.79%	ZION	-0.39%
10.0	ON	-0.79%	CVS	-0.37%
10.0	BALL	-0.73%	CHTR	-0.35%
10.0	BIIB	-0.68%	CLF	-0.34%
10.0	CVS	-0.61%	FIS	-0.33%
10.0	VZ	-0.57%	GSK	-0.33%
10.0	USB	-0.51%	TFC	-0.33%

All TMD: 21d

Results reflect ticker level average ROEDB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEDB_V	Ticker_S	ROEDB_S
21.0	AVGO	-67.33%	AVGO	-52.48%
21.0	SBNY	-32.56%	SBNY	-11.16%
21.0	SIVBQ	-21.2%	SIVBQ	-9.37%
21.0	FRCB	-13.47%	FRCB	-6.02%
21.0	AMC	-10.42%	AMC	-4.22%
21.0	AAP	-7.93%	AAP	-3.66%
21.0	ELAN	-4.5%	IEP	-3.58%
21.0	IEP	-4.14%	VFC	-2.45%
21.0	NWL	-3.77%	NWL	-2.41%
21.0	VFC	-3.45%	CZR	-1.94%
21.0	CHTR	-3.16%	UAA	-1.66%
21.0	LUMN	-2.89%	ELAN	-1.54%
21.0	BHC	-2.63%	BHC	-1.5%
21.0	TLT	-2.41%	CYH	-1.26%
21.0	LNC	-2.18%	LUMN	-1.2%
21.0	FIS	-2.13%	BALL	-1.19%
21.0	CYH	-2.02%	INTC	-1.16%
21.0	GSK	-1.99%	LNC	-1.04%
21.0	BXP	-1.88%	TLT	-1.03%
21.0	ON	-1.75%	BXP	-1.01%
21.0	CVS	-1.62%	GNRC	-0.97%
21.0	BIIB	-1.59%	GT	-0.94%
21.0	PRGO	-1.58%	AA	-0.91%
21.0	BALL	-1.39%	MOS	-0.84%
21.0	GT	-1.27%	CVS	-0.79%
21.0	TSLA	-1.2%	BIIB	-0.78%
21.0	ZION	-1.18%	CHTR	-0.76%
21.0	VNO	-1.18%	CLF	-0.74%
21.0	NEM	-1.0%	CSTM	-0.7%
21.0	VZ	-0.95%	TFC	-0.65%

All TMD: 63d

Results reflect ticker level average ROEDB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEDB_V	Ticker_S	ROEDB_S
63.0	SBNY	-111.62%	AVGO	-51.31%
63.0	SIVBQ	-84.01%	SBNY	-37.59%
63.0	AVGO	-79.76%	SIVBQ	-33.73%
63.0	FRCB	-59.55%	FRCB	-24.04%
63.0	AMC	-32.87%	AMC	-15.98%
63.0	AAP	-23.98%	IEP	-12.03%
63.0	IEP	-14.52%	AAP	-10.59%
63.0	VFC	-11.27%	NWL	-6.49%
63.0	NWL	-9.25%	VFC	-5.79%
63.0	ELAN	-8.66%	MOS	-5.71%
63.0	CHTR	-7.54%	CZR	-5.26%
63.0	TLT	-6.71%	CLF	-5.1%
63.0	BHC	-6.49%	INTC	-4.58%
63.0	MOS	-6.06%	BHC	-4.43%
63.0	CVS	-5.85%	ELAN	-4.35%
63.0	LNC	-5.75%	CVS	-4.04%
63.0	CYH	-5.67%	AA	-4.0%
63.0	FIS	-5.45%	UAA	-3.92%
63.0	BALL	-4.84%	BALL	-3.43%
63.0	GSK	-4.8%	LNC	-3.31%
63.0	CLF	-4.55%	TLT	-3.03%
63.0	PRGO	-4.39%	BXP	-2.97%
63.0	INTC	-4.26%	CSTM	-2.76%
63.0	CNC	-4.13%	NEM	-2.6%
63.0	JAZZ	-3.8%	PRGO	-2.45%
63.0	ON	-3.28%	LUMN	-2.44%
63.0	BIIB	-3.26%	GT	-2.41%
63.0	BXP	-3.19%	GNRC	-2.39%
63.0	CSTM	-3.04%	CHTR	-2.32%
63.0	LUMN	-2.92%	CNC	-2.25%

All TMD: 126d

Results reflect ticker level average ROEDB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEDB_V	Ticker_S	ROEDB_S
126.0	SBNY	-192.56%	SIVBQ	-65.15%
126.0	SIVBQ	-162.07%	SBNY	-64.8%
126.0	FRCB	-138.04%	AVGO	-51.37%
126.0	AVGO	-88.81%	FRCB	-51.17%
126.0	AMC	-54.69%	AMC	-29.19%
126.0	AAP	-46.72%	IEP	-22.25%
126.0	IEP	-31.0%	AAP	-21.48%
126.0	VFC	-23.74%	NWL	-13.64%
126.0	NWL	-18.56%	MOS	-12.52%
126.0	MOS	-15.78%	VFC	-10.81%
126.0	CVS	-14.64%	CVS	-8.87%
126.0	CHTR	-12.63%	CLF	-8.38%
126.0	ELAN	-12.54%	INTC	-7.34%
126.0	PRGO	-12.11%	CZR	-6.89%
126.0	BHC	-11.68%	ELAN	-6.74%
126.0	LNC	-11.54%	PRGO	-6.26%
126.0	TLT	-10.81%	LNC	-5.75%
126.0	GSK	-10.15%	CTLT	-5.69%
126.0	JAZZ	-9.32%	AA	-5.56%
126.0	CNC	-7.16%	TLT	-5.28%
126.0	AA	-6.94%	GT	-4.95%
126.0	INTC	-6.72%	GSK	-4.82%
126.0	CYH	-6.5%	CNC	-4.8%
126.0	CZR	-5.84%	BHC	-4.58%
126.0	FIS	-5.61%	NEM	-4.4%
126.0	CLF	-5.57%	UAA	-4.2%
126.0	NEM	-4.54%	BXP	-4.13%
126.0	BMY	-4.22%	BALL	-4.03%
126.0	BIIB	-4.2%	CHTR	-3.71%
126.0	LUMN	-4.17%	KHC	-3.43%

All TMD: 252d

Results reflect ticker level average ROEDB across all model dates for which actual results for the stated horizon are known.

Period examined: All model dates from 2022-01-31 through 2025-03-28

Horizon	Ticker_V	ROEDB_V	Ticker_S	ROEDB_S
252.0	SBNY	-283.27%	SBNY	-95.75%
252.0	SIVBQ	-231.16%	SIVBQ	-95.29%
252.0	FRCB	-206.23%	FRCB	-91.61%
252.0	AVGO	-113.98%	AMC	-60.88%
252.0	AMC	-108.23%	AVGO	-60.54%
252.0	AAP	-92.47%	IEP	-44.04%
252.0	IEP	-68.18%	AAP	-41.91%
252.0	VFC	-65.49%	NWL	-28.56%
252.0	NWL	-46.27%	VFC	-26.08%
252.0	CVS	-39.61%	MOS	-25.47%
252.0	MOS	-38.91%	CVS	-20.56%
252.0	CHTR	-31.47%	LUMN	-14.0%
252.0	PRGO	-25.89%	BMY	-13.9%
252.0	UAA	-25.03%	PRGO	-13.16%
252.0	JAZZ	-23.85%	UAA	-12.48%
252.0	LNC	-21.62%	CZR	-12.38%
252.0	TLT	-20.4%	CLF	-12.2%
252.0	CLF	-18.64%	JAZZ	-10.75%
252.0	BHC	-18.3%	CHTR	-10.33%
252.0	AA	-17.08%	AA	-9.65%
252.0	LUMN	-16.89%	TLT	-8.94%
252.0	BMY	-15.64%	CNC	-8.64%
252.0	CZR	-14.82%	INTC	-7.38%
252.0	BIIB	-13.49%	GT	-7.03%
252.0	BXP	-12.01%	LNC	-6.97%
252.0	GT	-10.18%	BHC	-6.85%
252.0	CNC	-9.23%	KHC	-6.28%
252.0	OXY	-9.03%	CTLT	-6.24%
252.0	NEM	-9.02%	BIIB	-6.21%
252.0	KHC	-8.41%	NEM	-6.02%

Appendix 1: Calculating "Expected Body" for Sigma

An expected value is a probabilty weighted average. An integral provides the sum of the values of a function of x between two values of x. The "Expected Body" is the expected value between the model date value and the 95%tile for the forecast horizon. "Sigma" is our term to refer to the probability density function of the standard normal distribution, N. We will assume the model date price is the 0 value of the standard normal distributiuon and we know the 95% tile occurs at 1.645 standard deviations (sigmas). Therefore, the Expected Body for Sigma is the integral of x*N between x=0 and x=1.645. Because the Expected Body is conditioned upon forward price residing between 0 and 1.645 sigmas, we then divide that integral by the integral of N between x=0 and x=1.645. See the Python code below, which yields the result "Probability-weighted average value of sigma: 0.6573812144320618"

from scipy.stats import norm from scipy.integrate import quad

def prod_integrand(x): return x * norm.pdf(x)

pwa_sigma, _ = quad(prod_integrand, 0, 1.645)

def integrand(x): return norm.pdf(x)

p_sigma, _ = quad(integrand, 0, 1.645)

ev=pwa_sigma/p_sigma

print("Probability-weighted average value of sigma:", ev)

If you don't do Python you can still easily check the veracity of the 0.657 expected value for Sigma for yourself by doing Riemann sums using excel's "NORMDIST" function. Here are the steps: 1) Make column A starting at 0 and going to 1.645 by 0.005 increments. This is your "x". 2) In column B refer to A as follows: "=NORMDIST(a,0,1,TRUE)". This is the cumulaive probability of the standard normal distribution up through x. 3) In column C take the differences betwene each value and its prior value in B. These are the probabilties between each value of x. 4) In column D take the average of each value in A and its prior value. This gives you the value of x at the center of each increment. 5) Multiply column D by column C up through A=1.645. This is your probabilty weighted average value of x. It should equal 0.295832. 6) Sum column C. This is your cumulative probabilty that x is between 0 and 1.645. It should equal 0.450002 7) Divide your probabilty weighted average value of x by your cumulative probabilty that x is between 0 and 1.645. You should get a value of 0.657383.

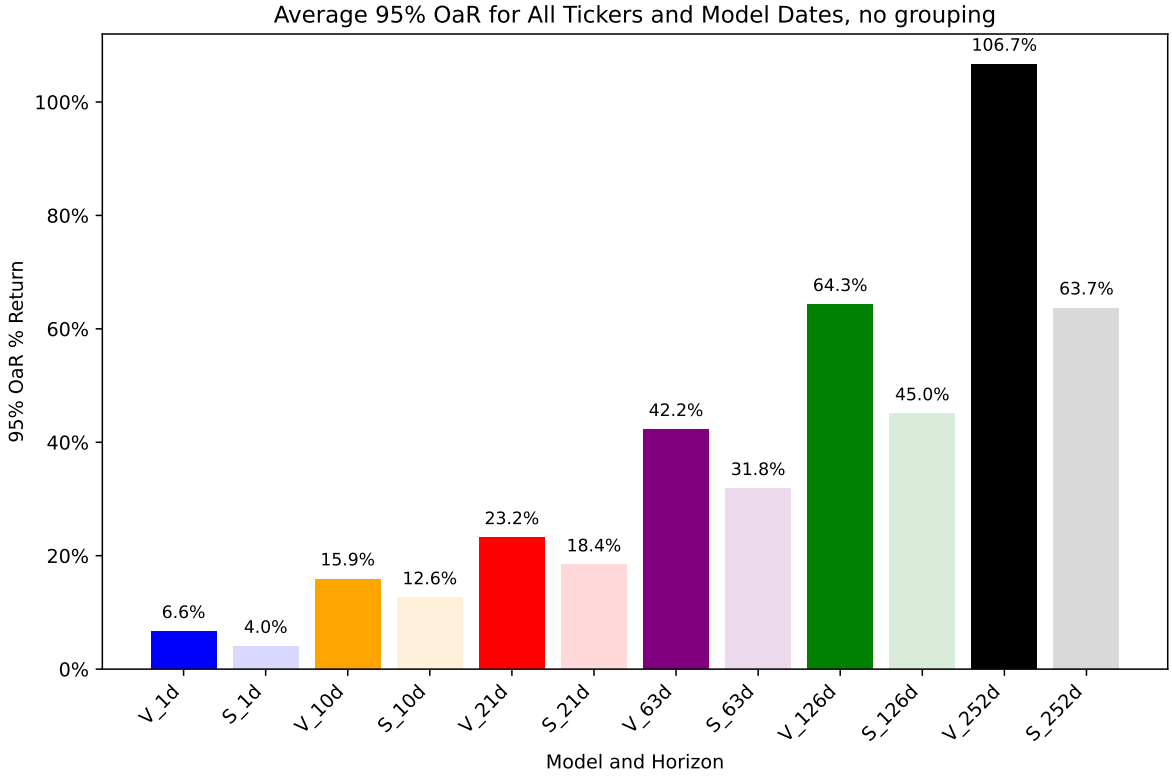
Appendix 2: 95% Opportunity at Risk (OaR)

Historic Average Levels

Here we compare Vector Model ("V", dark shading) and Sigma ("S", light shading) 95% OaR levels by horizon, on average across tickers. We make this comparison on average across tickers for select cohorts of model dates (ex: P30D), and forward horizons (ex: 21d) for all ticker model dates thru the present.

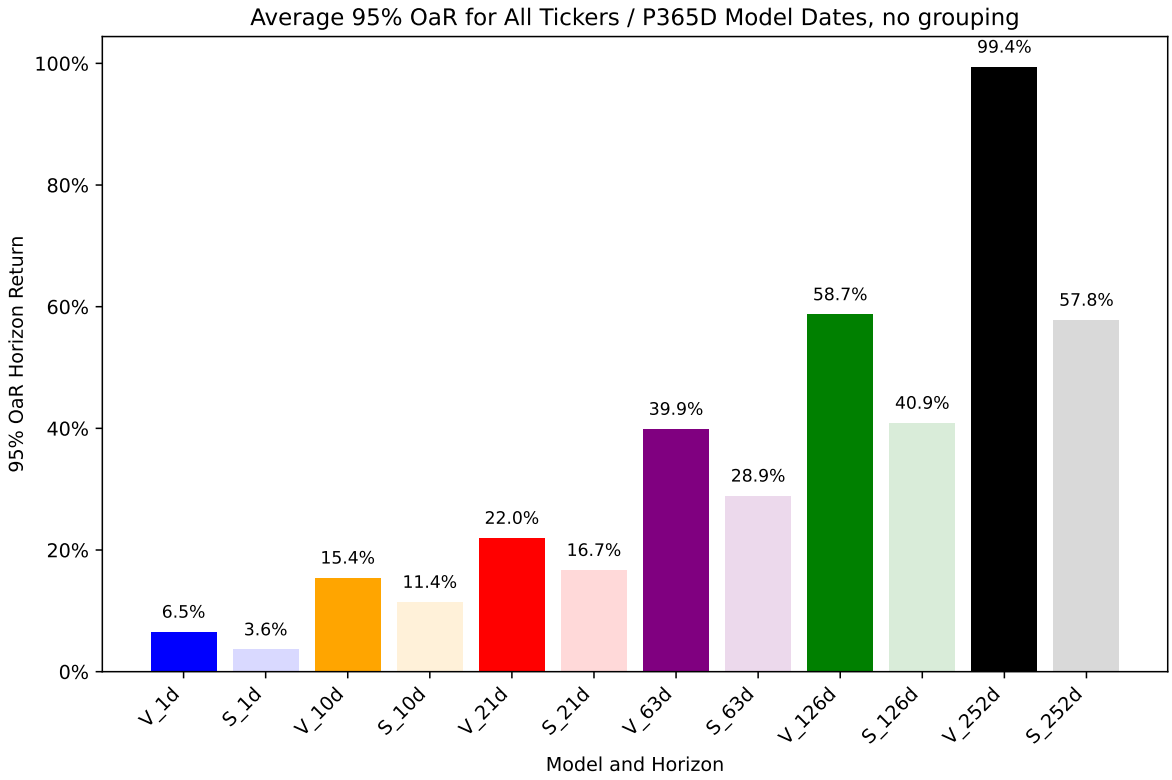
All Out of Sample Model Dates

Period examined: All model dates from 2022-01-31 through 2025-03-28



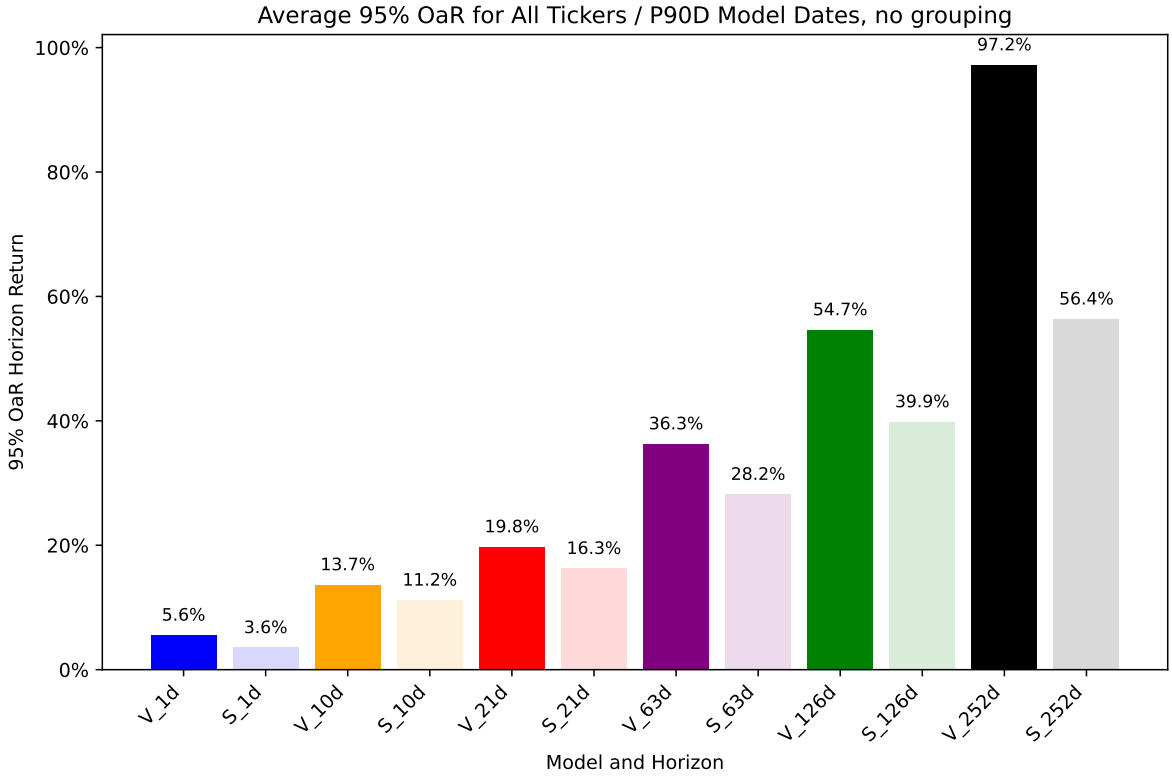
Prior 365 Calendar Days (P365D)

Period examined: All model dates from 2024-04-02 through 2025-03-28



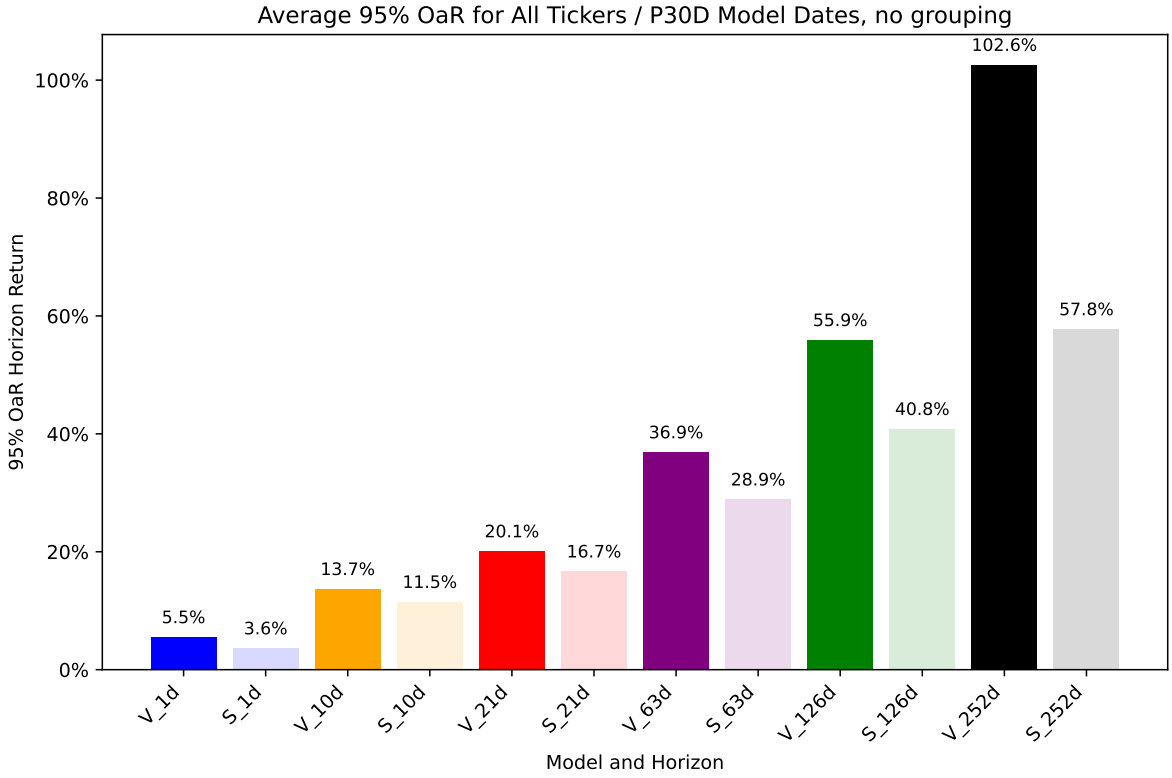
Prior 90 Calendar Days (P90D)

Period examined: All model dates from 2025-01-02 through 2025-03-28



Prior 30 Calendar Days (P30D)

Period examined: All model dates from 2025-03-03 through 2025-03-28



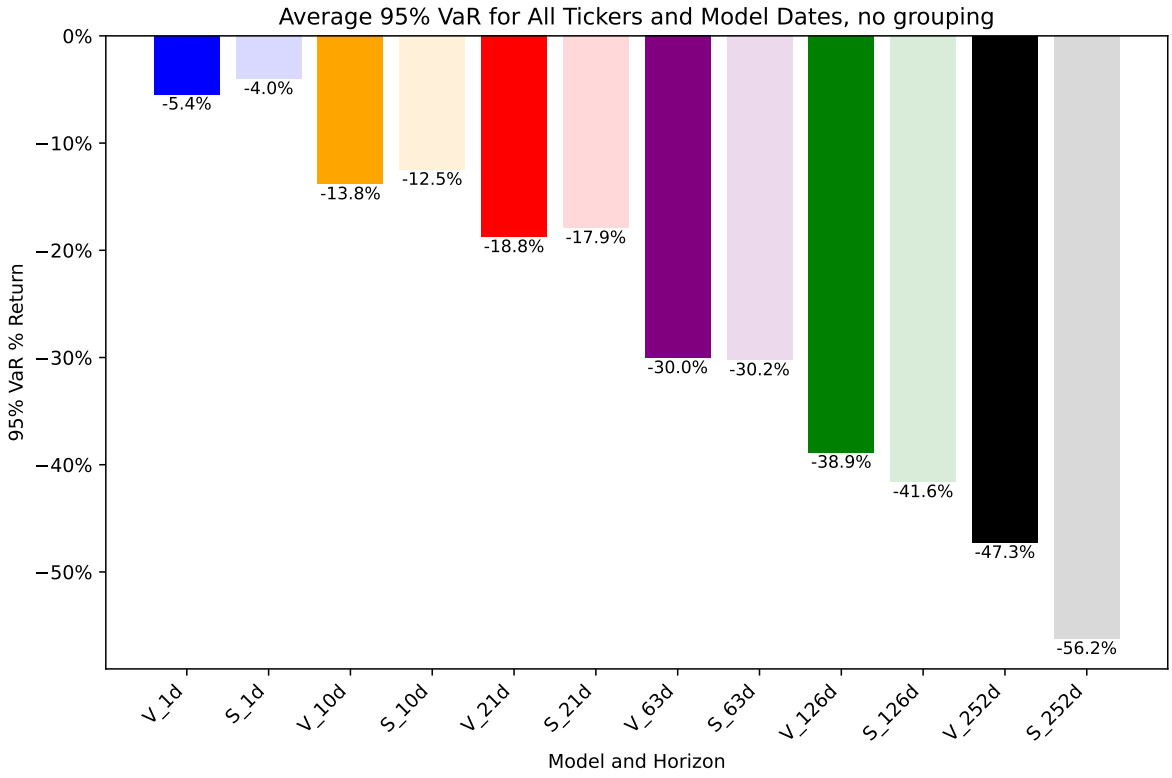
Appendix 3: 95% Value at Risk (VaR)

Historic Average Levels

Here we compare Vector Model ("V", dark shading) and Sigma ("S", light shading) 95% VaR levels by horizon, on average across tickers. We make this comparison on average across tickers for select cohorts of model dates (ex: P30D), and forward horizons (ex: 21d) for all ticker model dates thru the present.

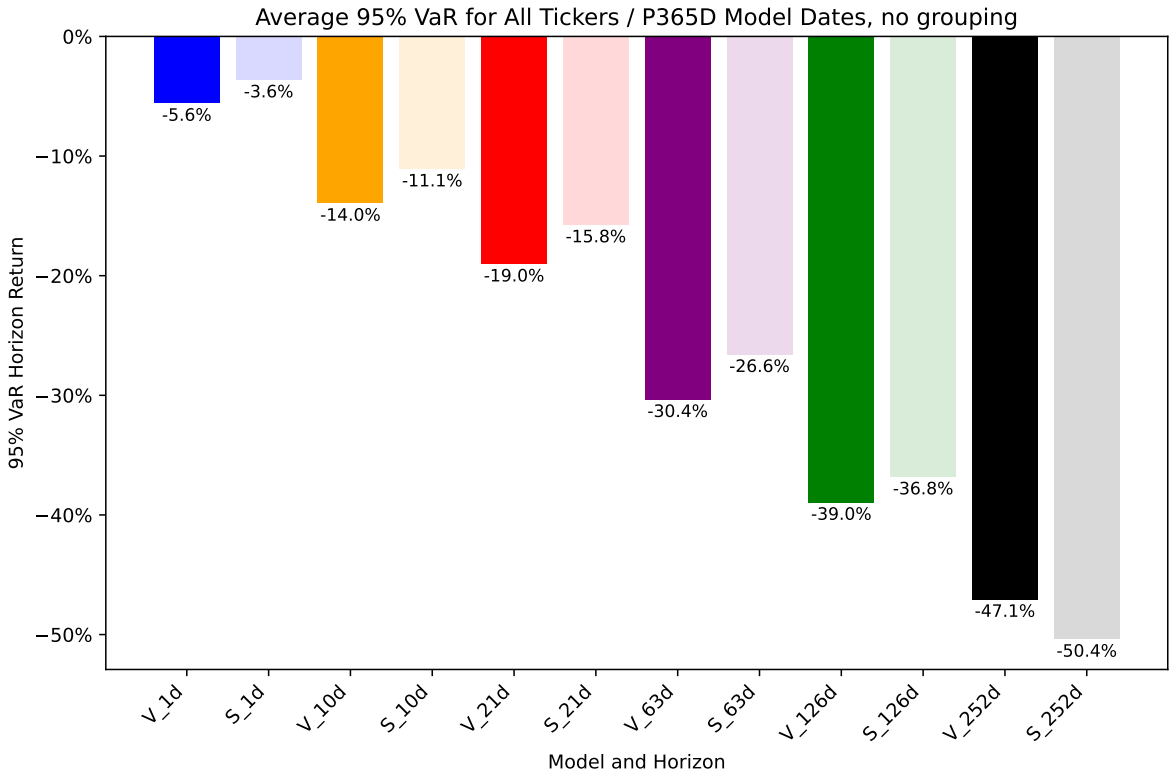
All Out of Sample Model Dates

Period examined: All model dates from 2022-01-31 through 2025-03-28



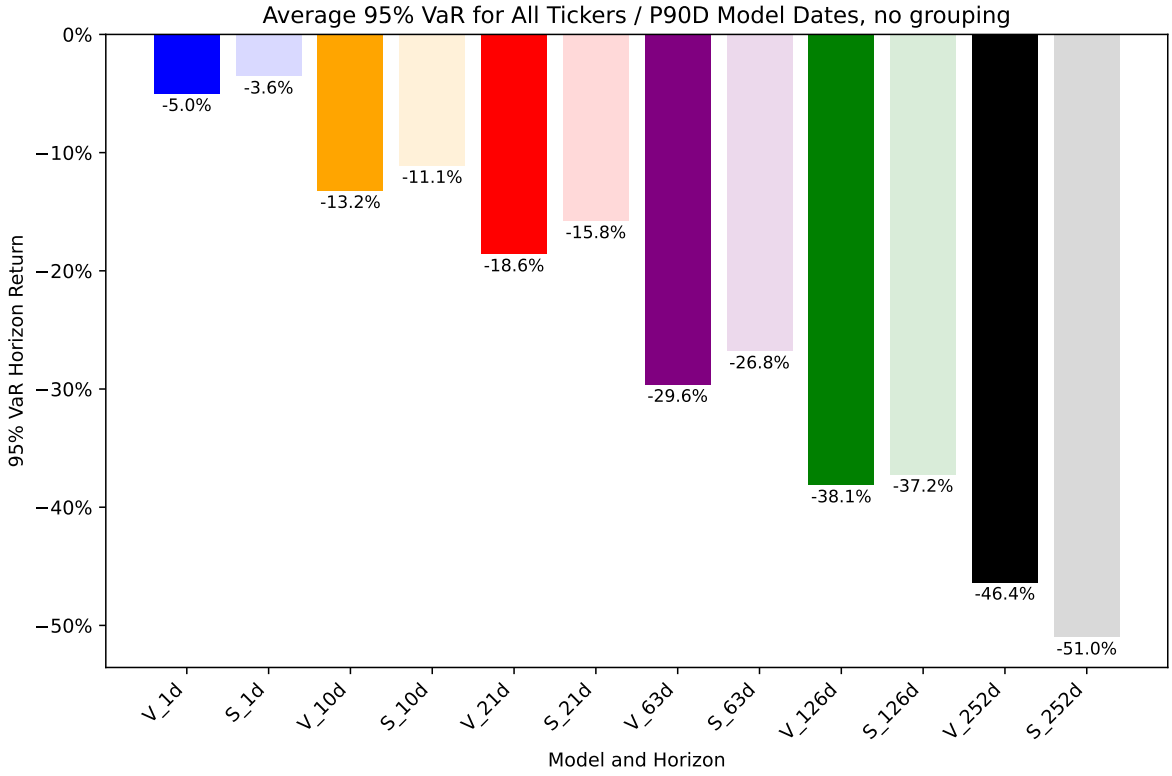
Prior 365 Calendar Days (P365D)

Period examined: All model dates from 2024-04-02 through 2025-03-28



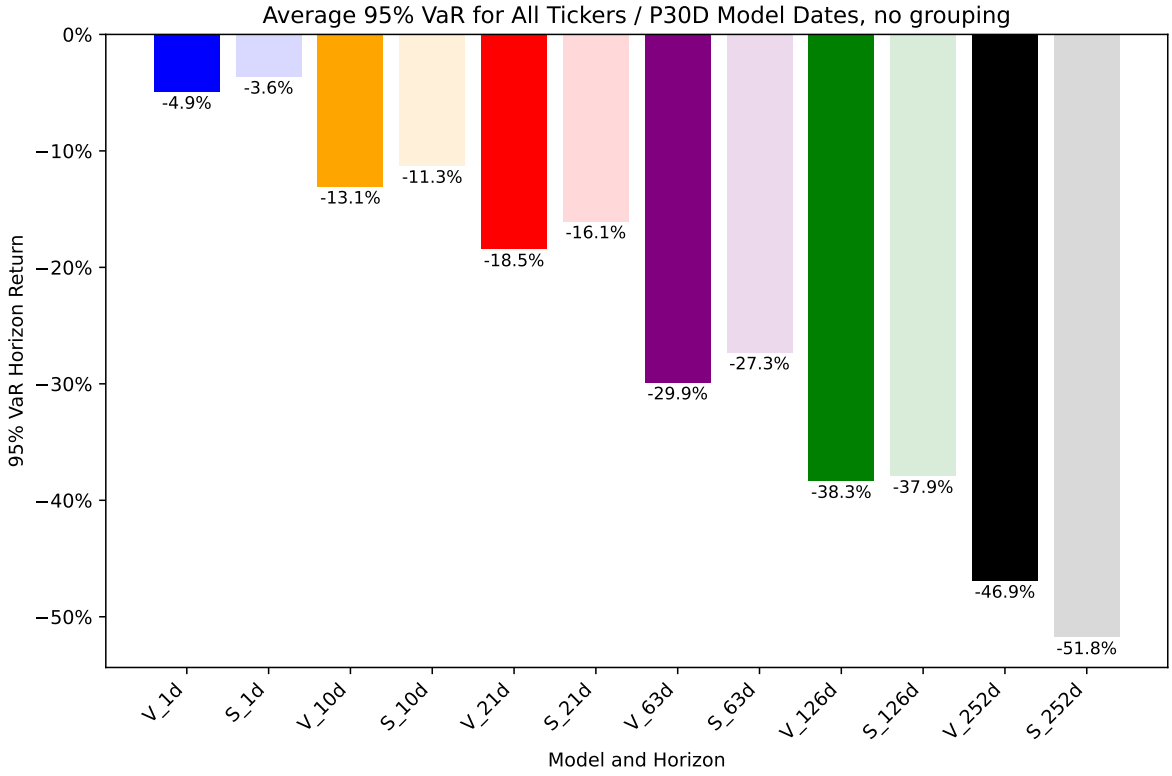
Prior 90 Calendar Days (P90D)

Period examined: All model dates from 2025-01-02 through 2025-03-28



Prior 30 Calendar Days (P30D)

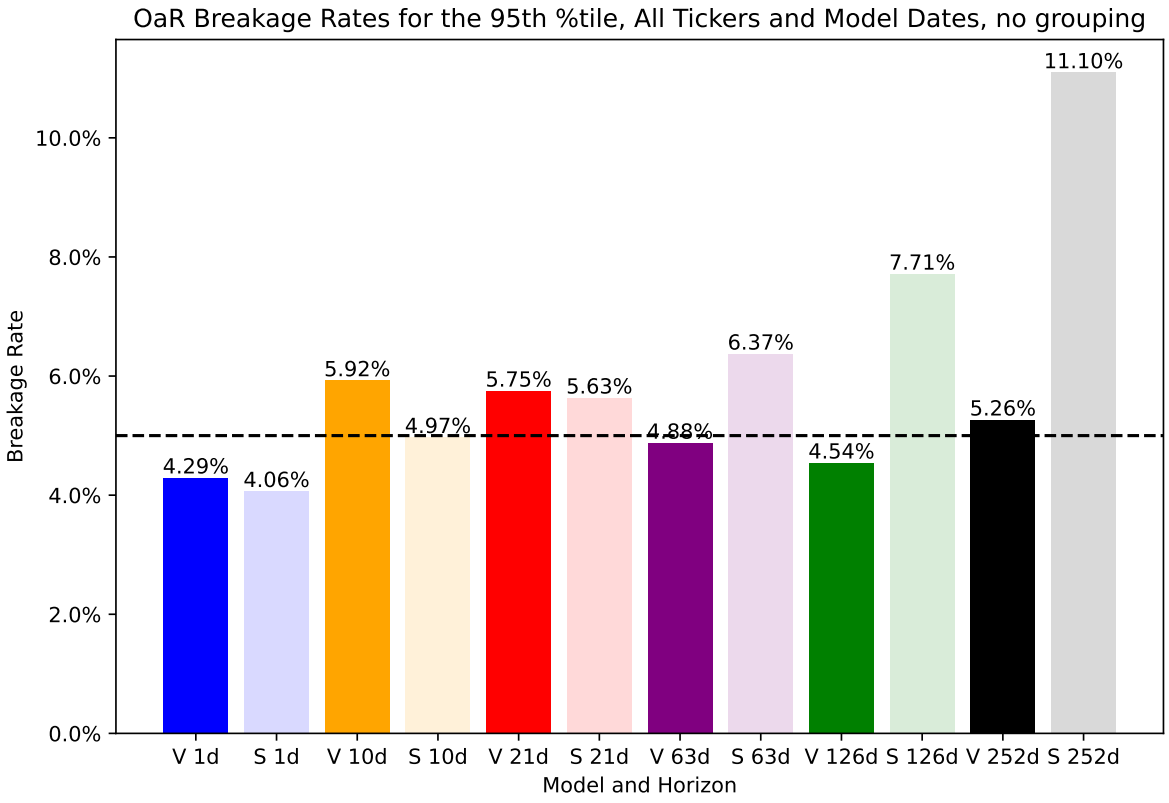
Period examined: All model dates from 2025-03-03 through 2025-03-28



Appendix 4: 95% OaR Breakage Rates

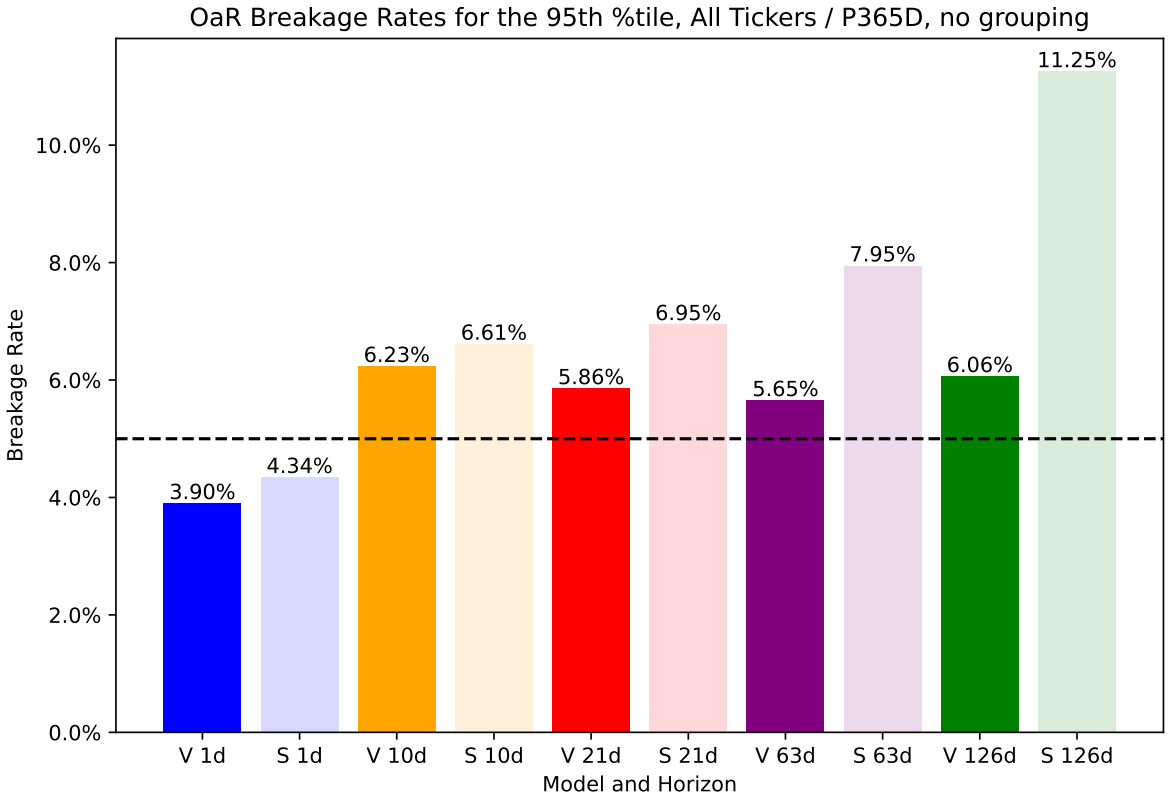
All Out of Sample Model Dates

Period examined: All model dates from 2022-01-31 through 2025-03-28



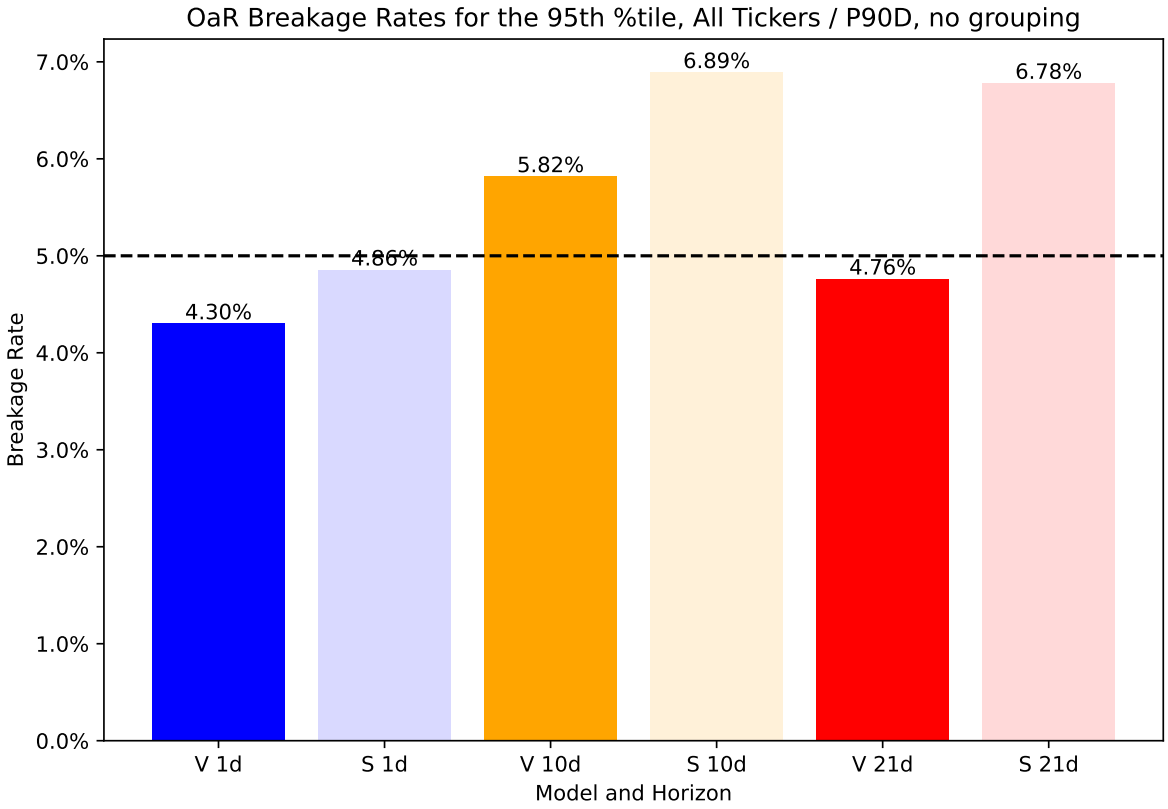
Prior 365 Calendar Days (P365D)

Period examined: All model dates from 2024-04-02 through 2025-03-28



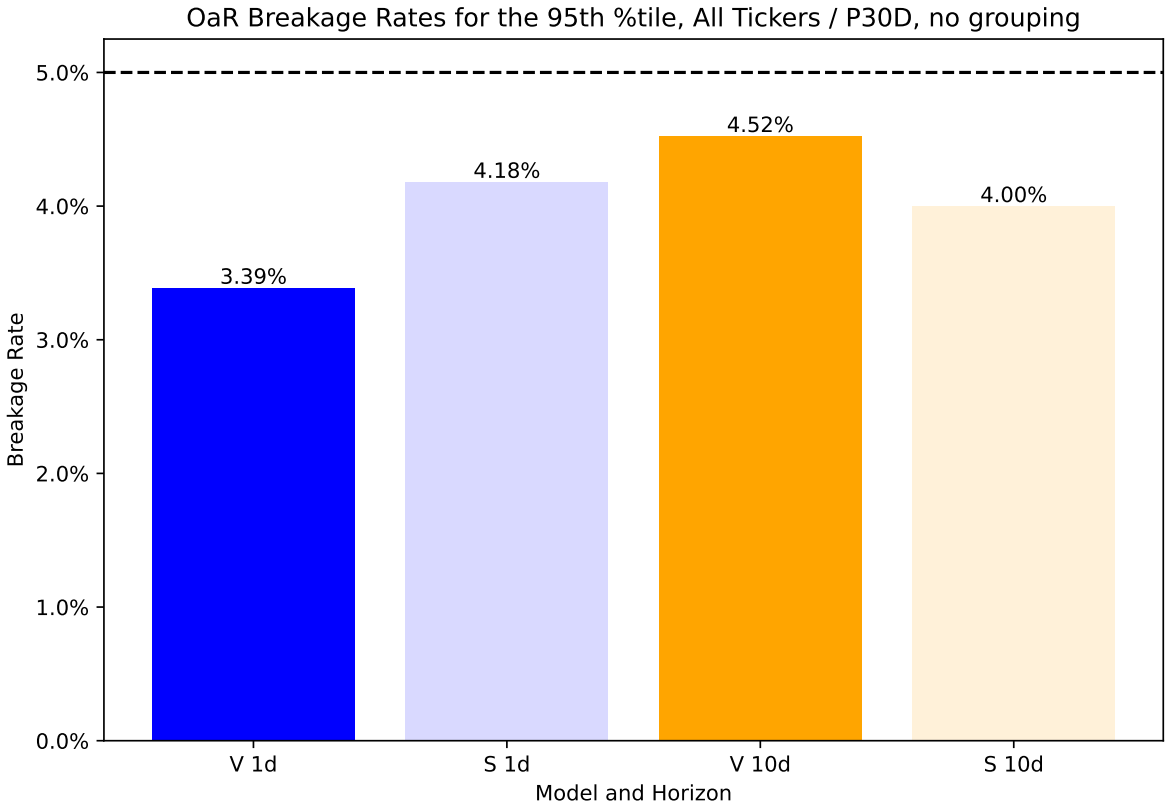
Prior 90 Calendar Days (P90D)

Period examined: All model dates from 2025-01-02 through 2025-03-28



Prior 30 Calendar Days (P30D)

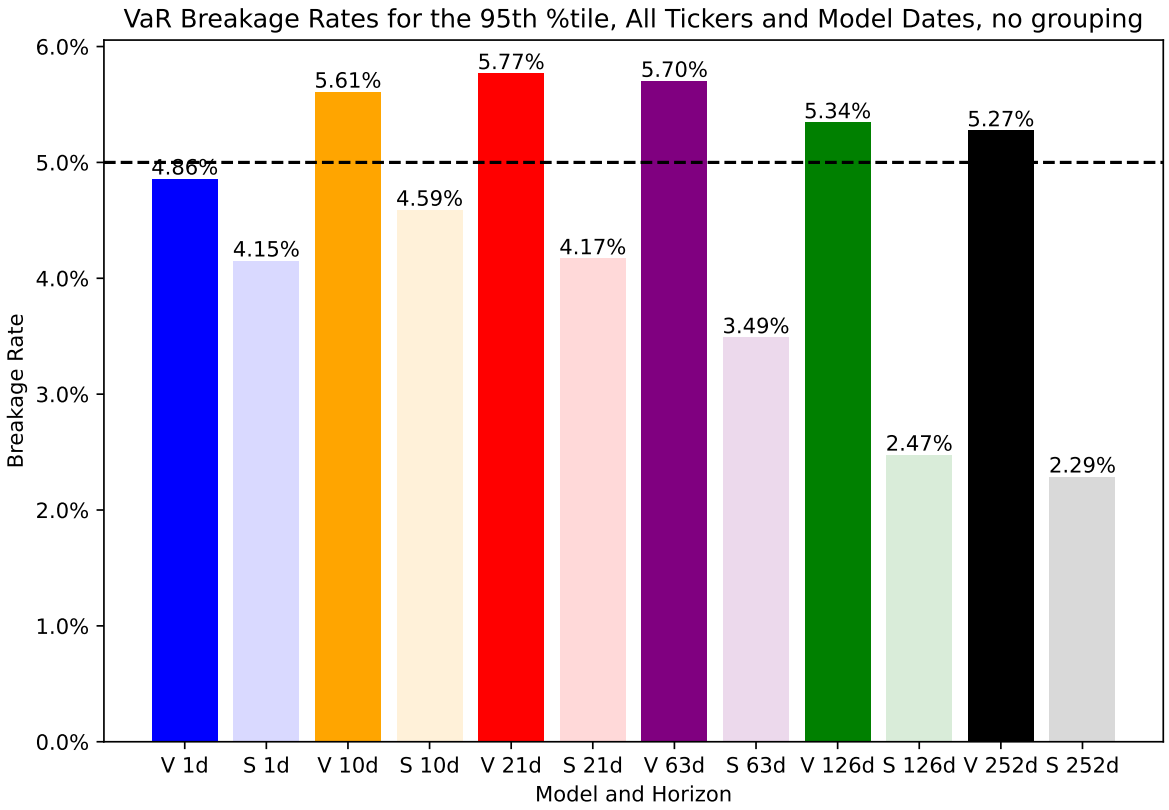
Period examined: All model dates from 2025-03-03 through 2025-03-28



Appendix 5: 95% VaR Breakage Rates

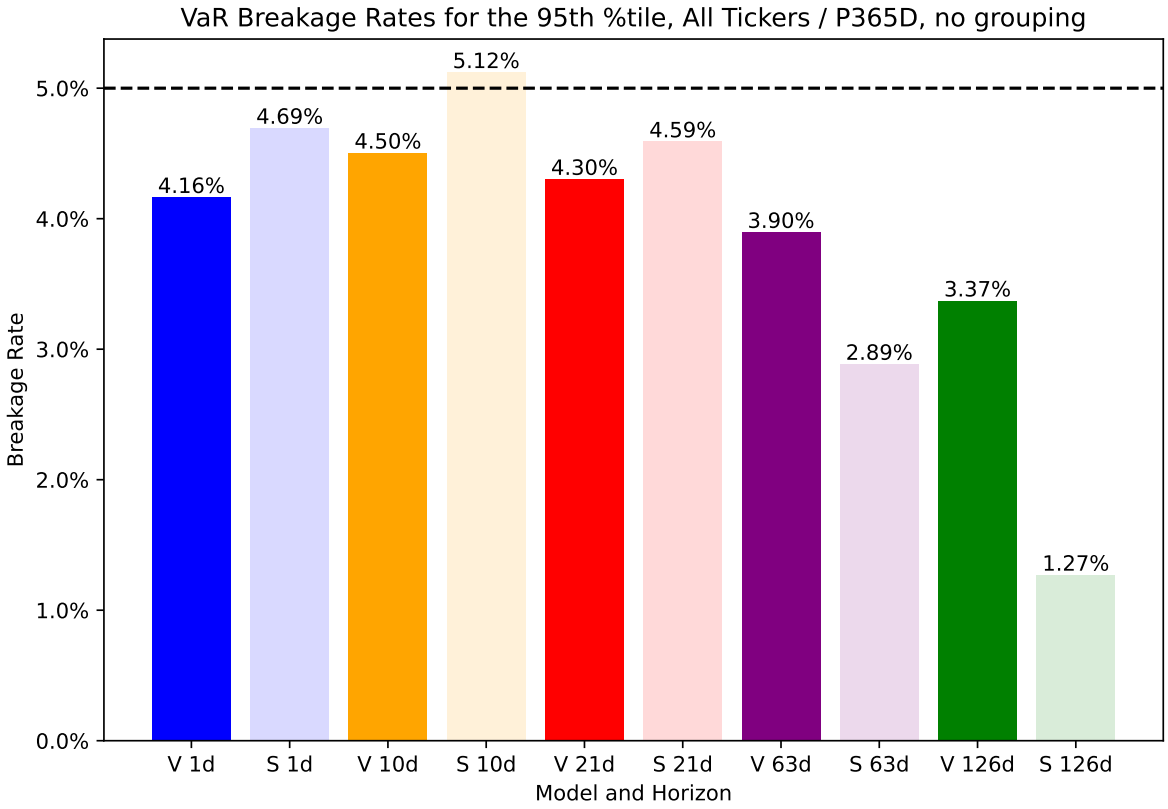
All Out of Sample Model Dates

Period examined: All model dates from 2022-01-31 through 2025-03-28



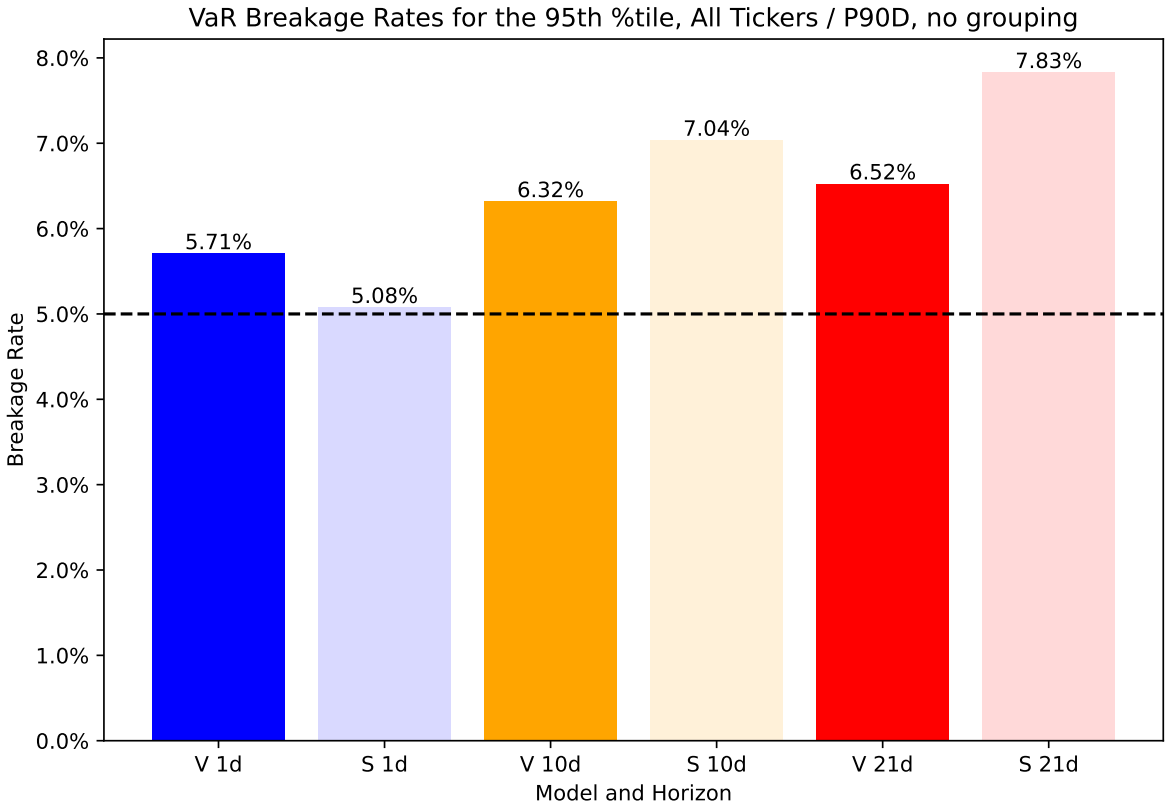
Prior 365 Calendar Days (P365D)

Period examined: All model dates from 2024-04-02 through 2025-03-28



Prior 90 Calendar Days (P90D)

Period examined: All model dates from 2025-01-02 through 2025-03-28



Prior 30 Calendar Days (P30D)

Period examined: All model dates from 2025-03-03 through 2025-03-28