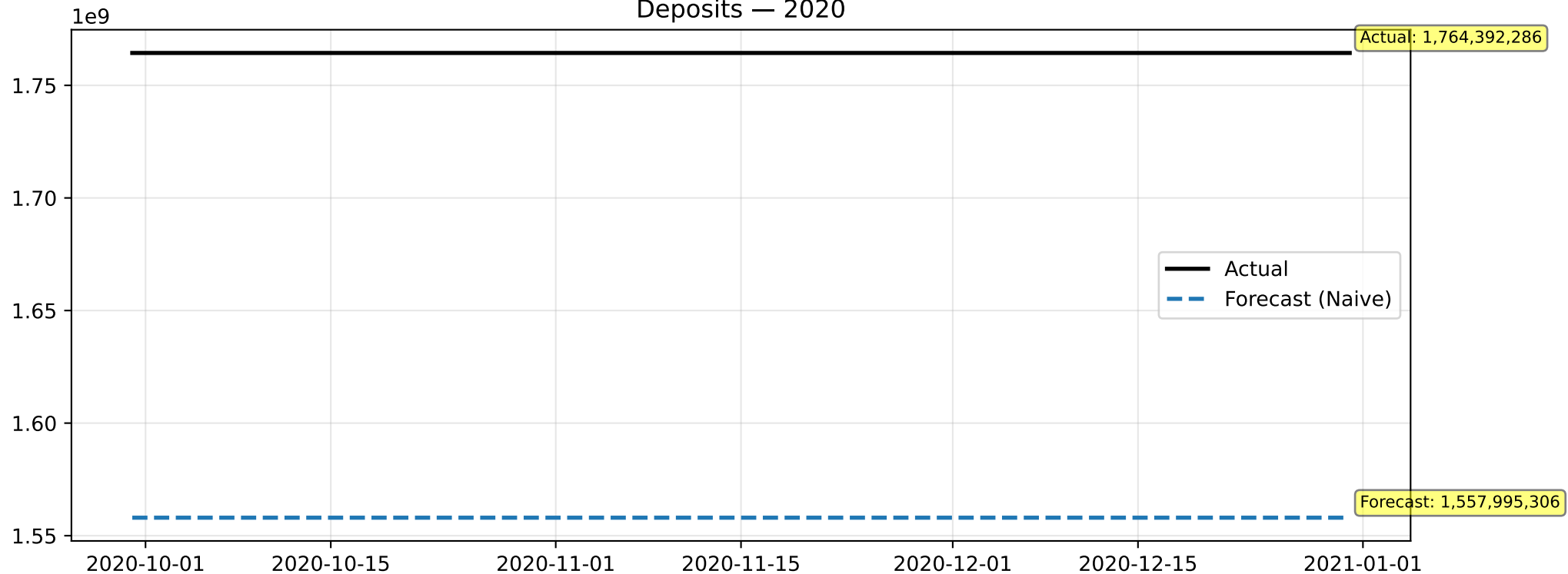
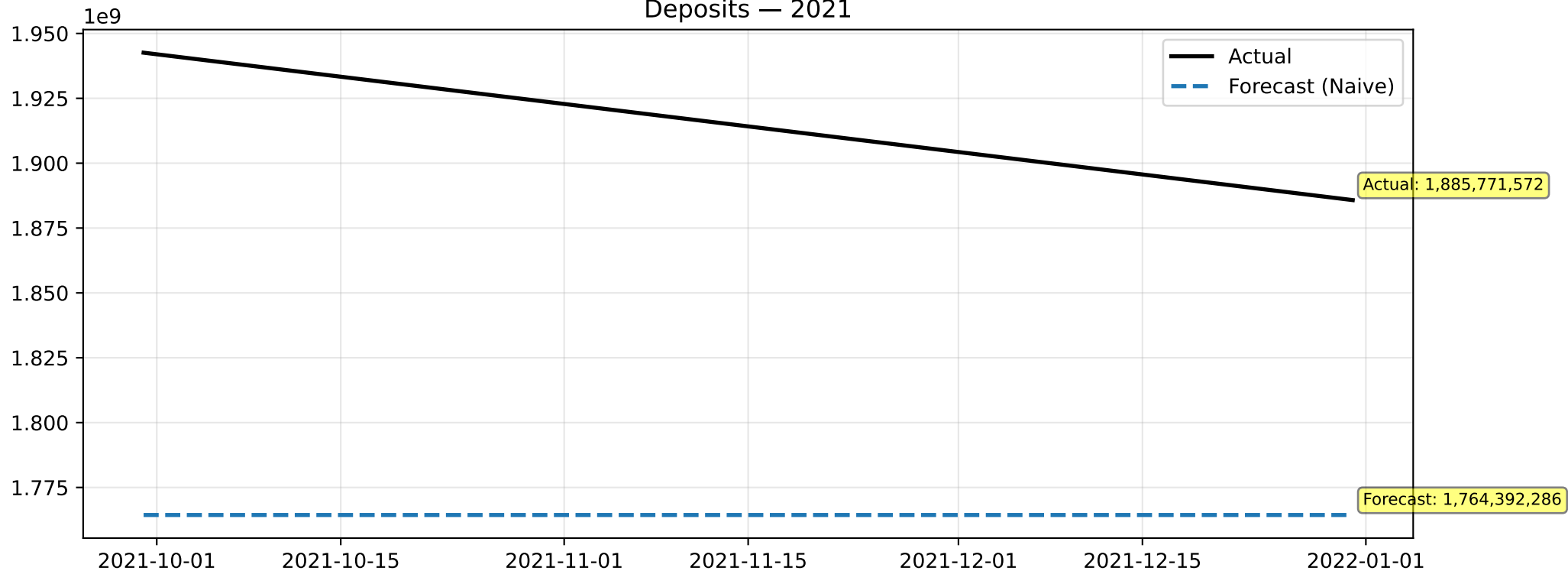


UBL – ML-Based Financial KPI Rolling-Backtests (2020–2025)
Models: Naive • SARIMAX-X (auto-validated) • Ridge-Lag • Hybrid
Best model = lowest MAPE per KPI-Year.
SARIMAX is auto-disabled when unstable.

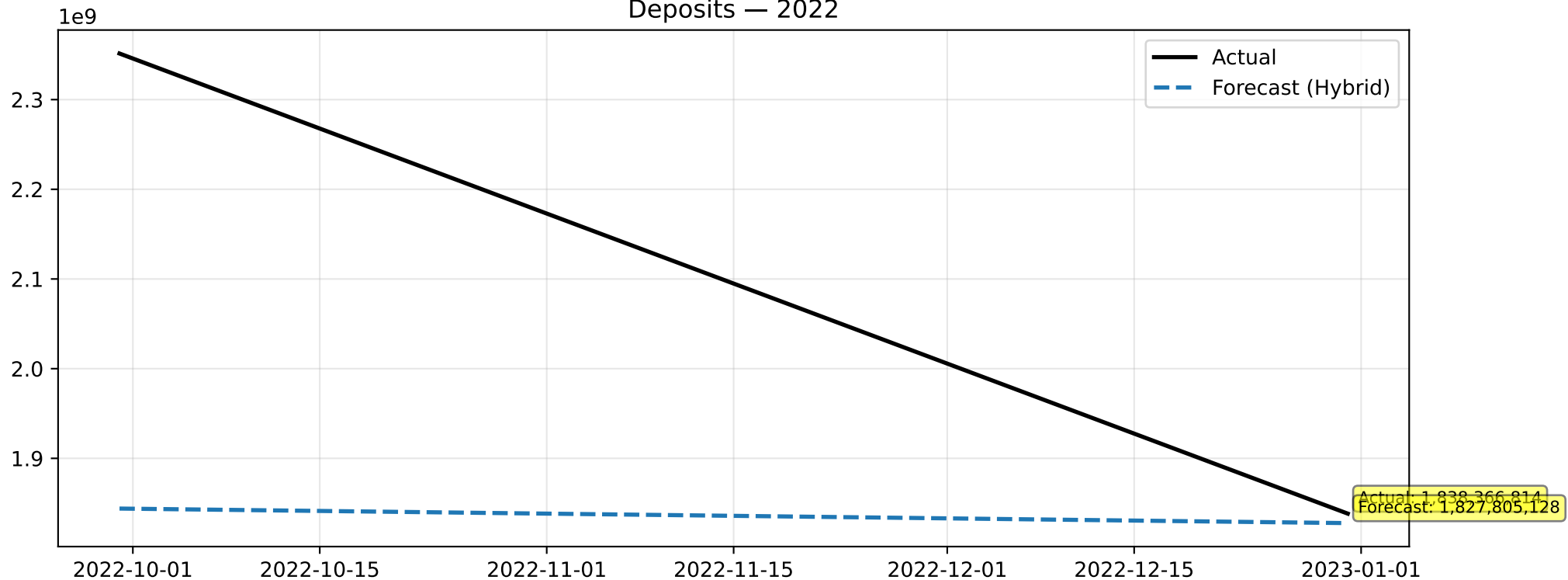
Deposits — 2020



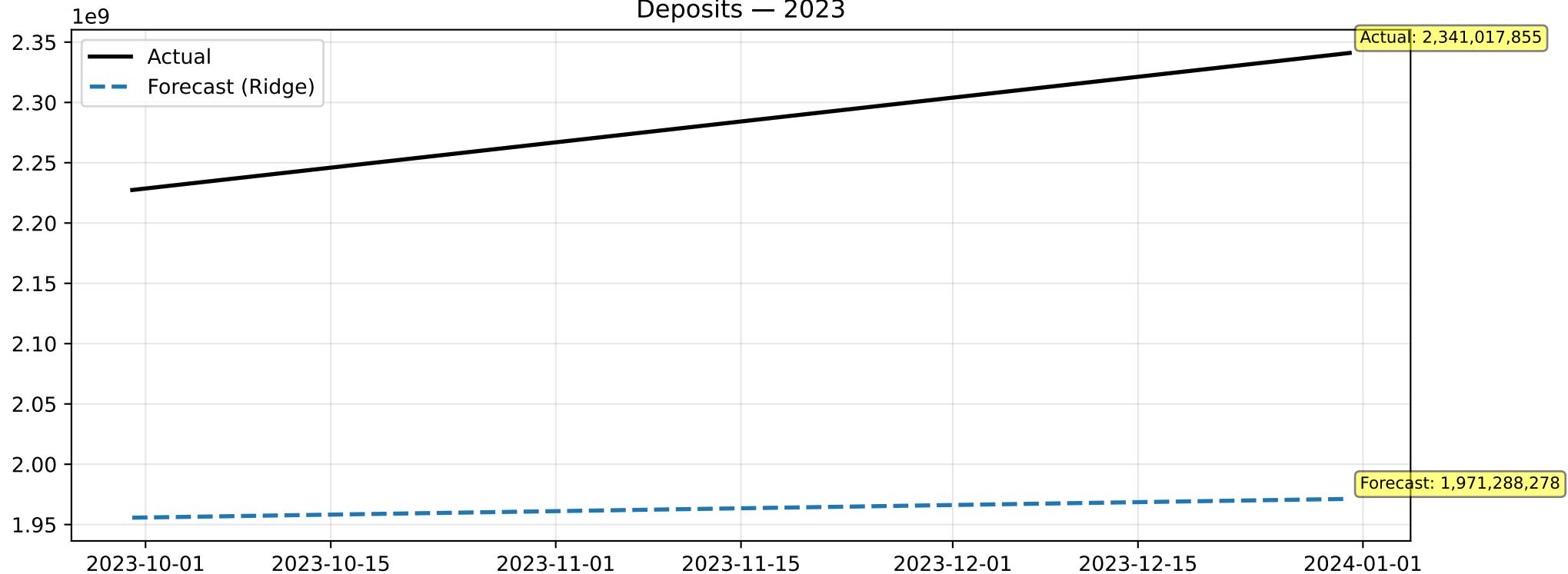
Deposits — 2021



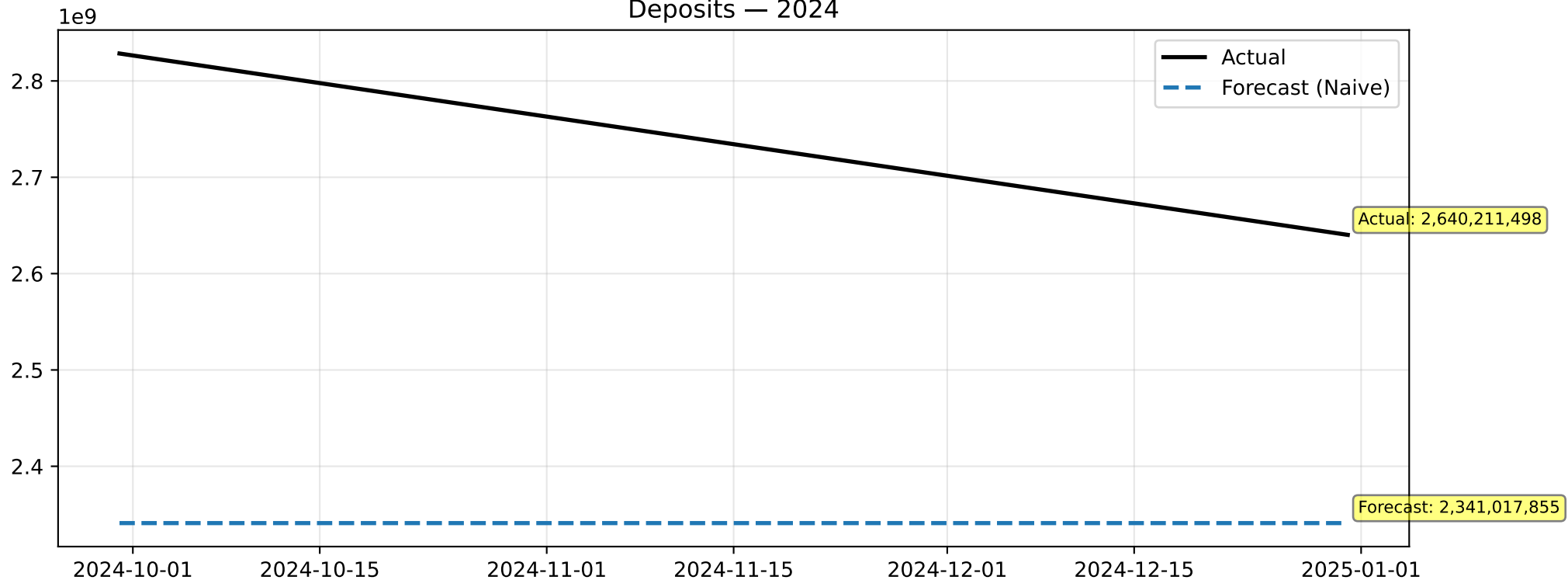
Deposits — 2022



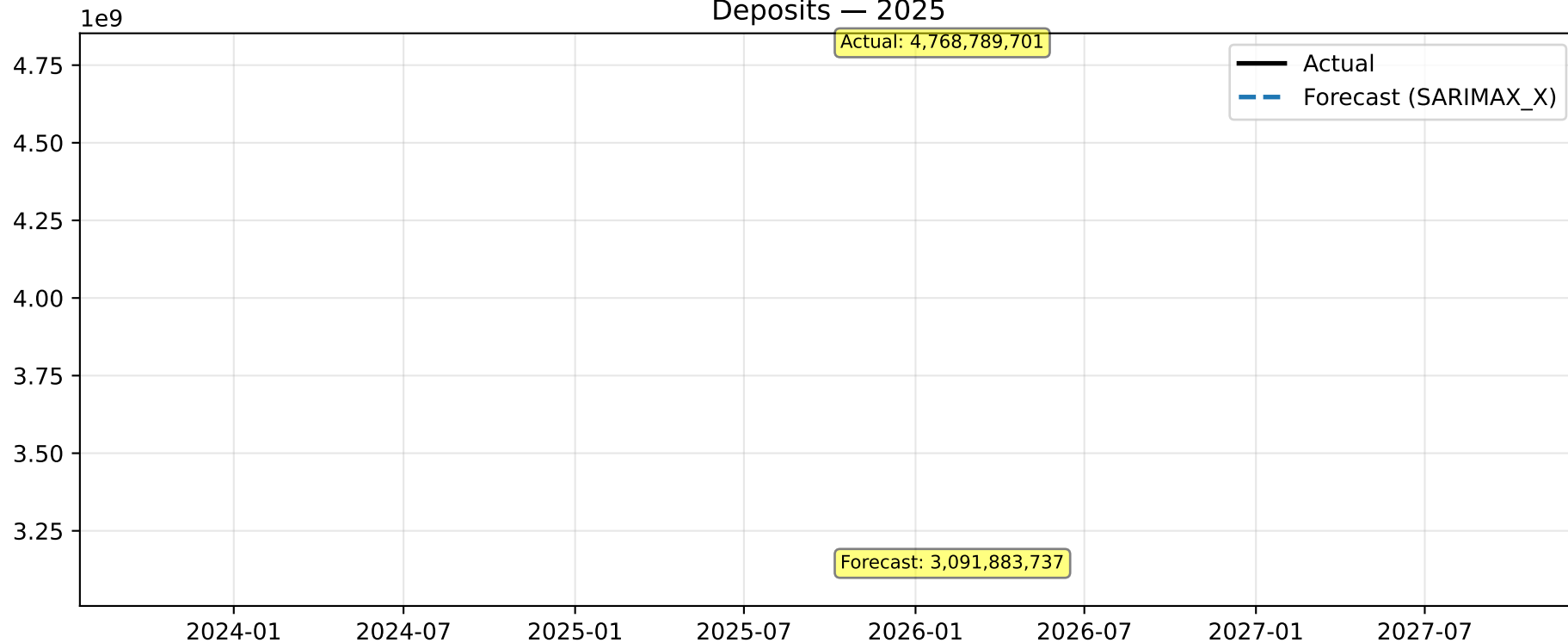
Deposits — 2023



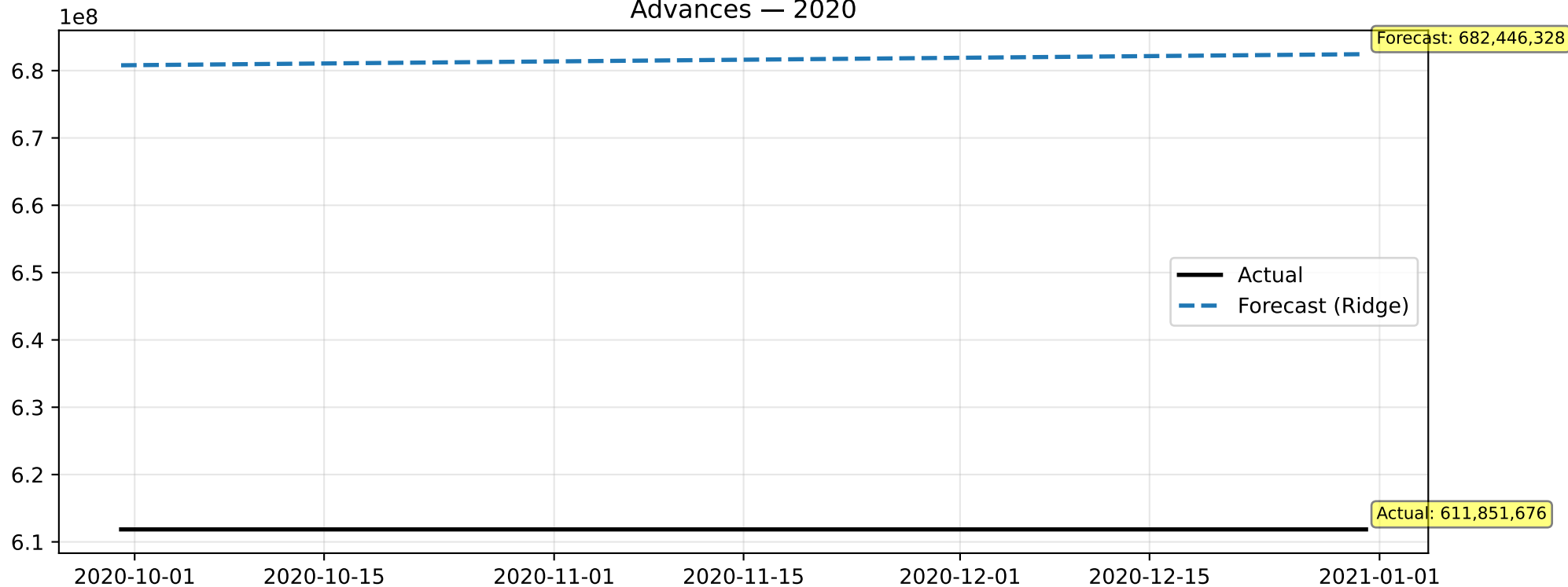
Deposits — 2024



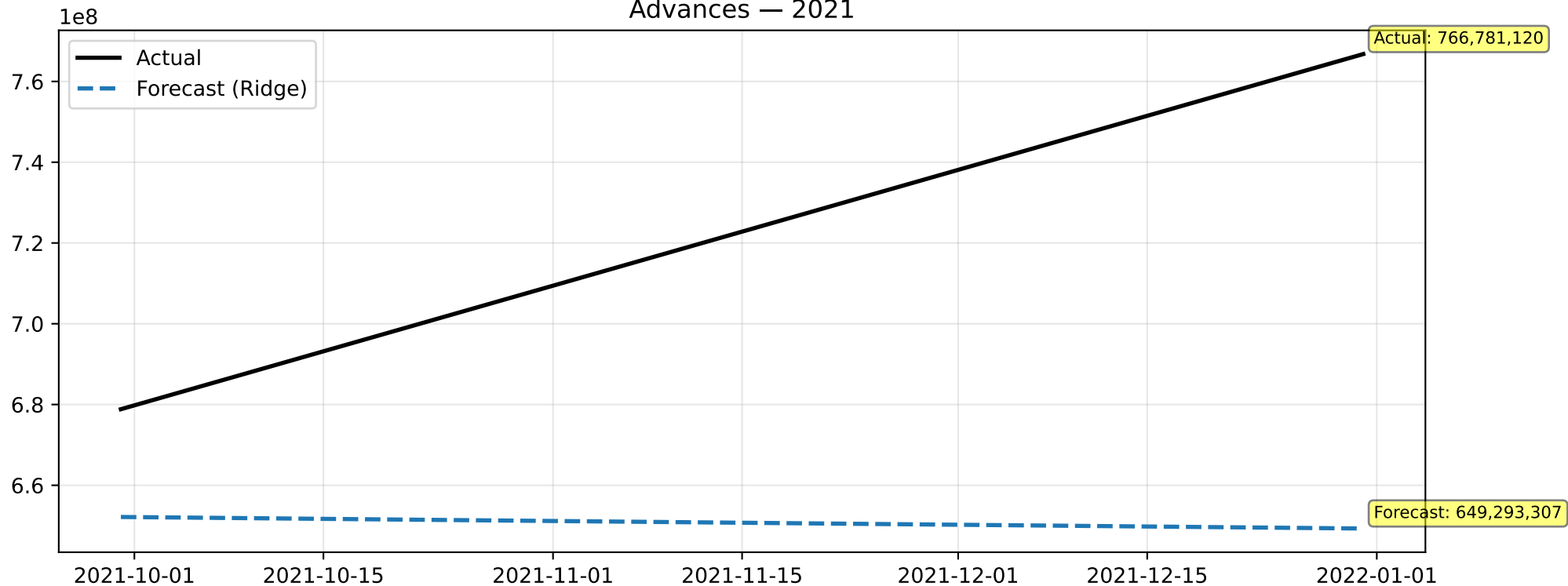
Deposits — 2025



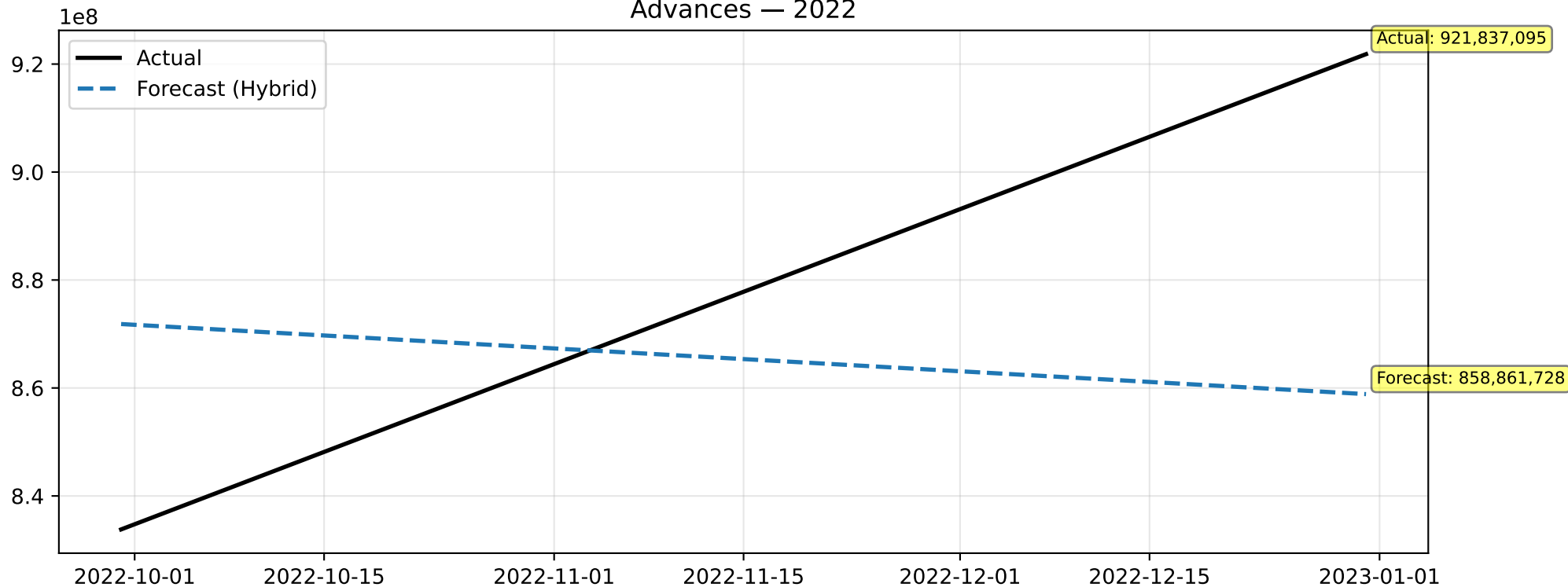
Advances — 2020



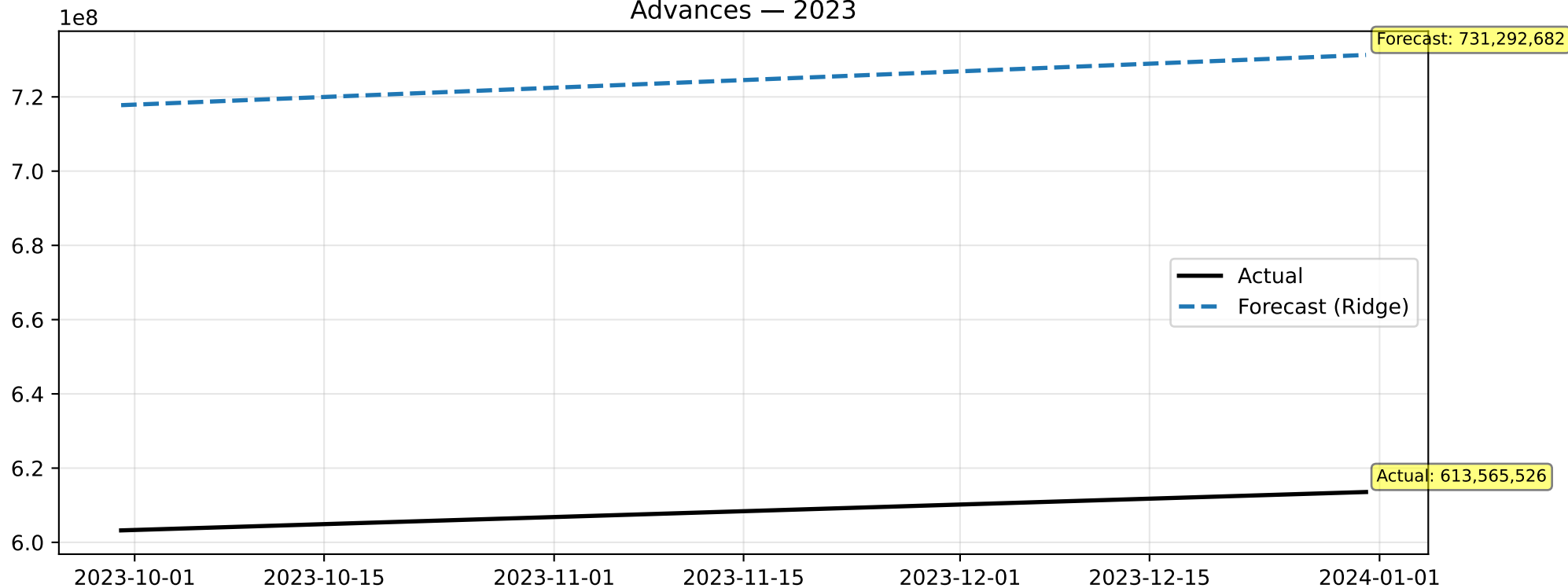
Advances — 2021



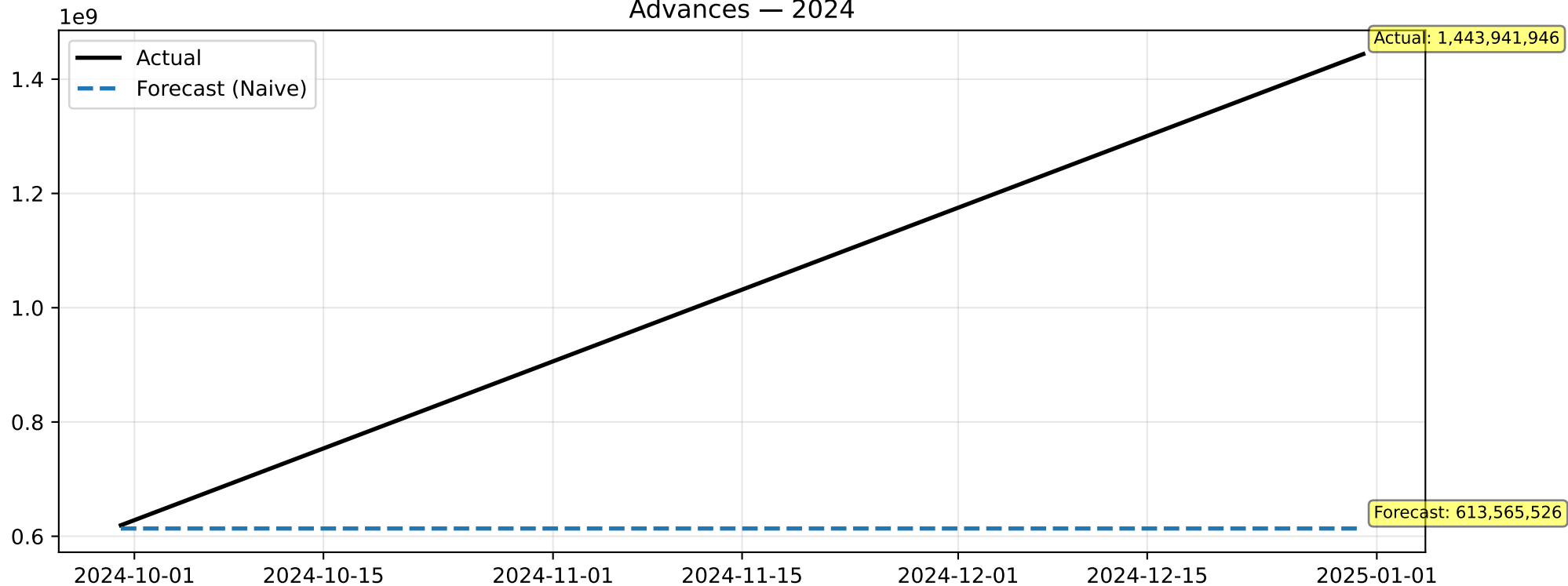
Advances — 2022



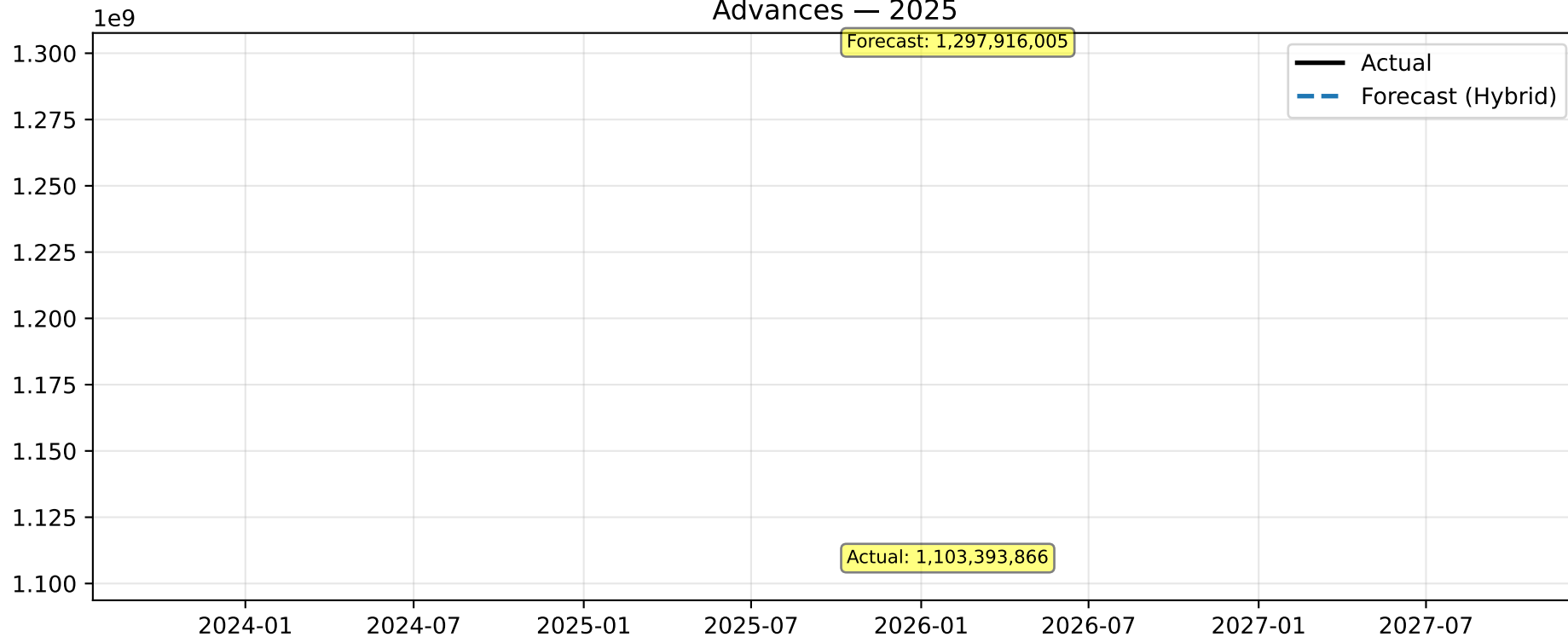
Advances — 2023



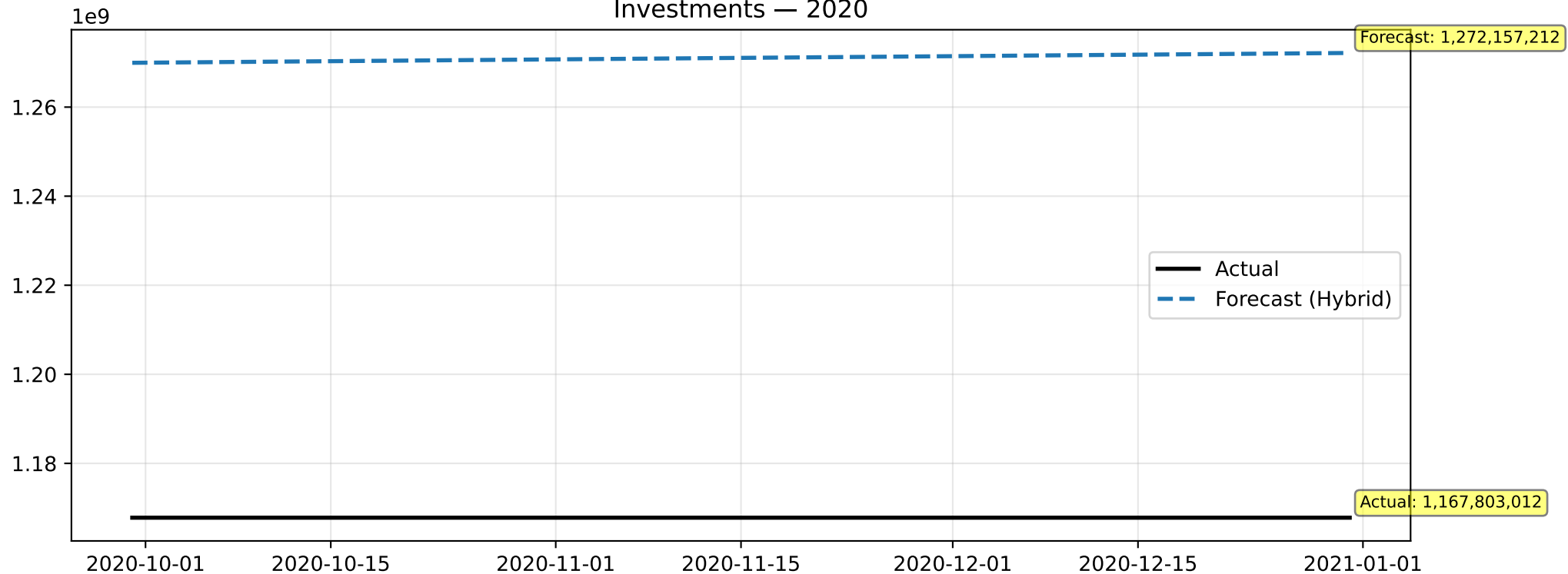
Advances — 2024

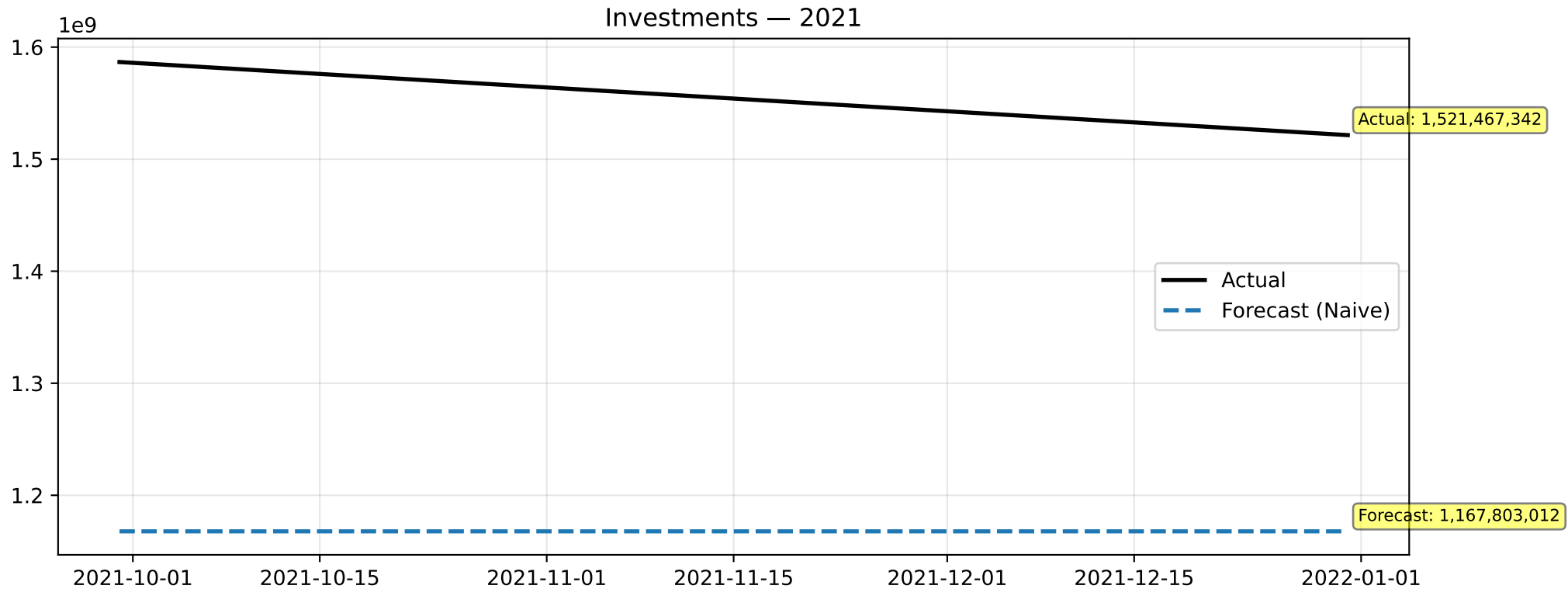


Advances — 2025

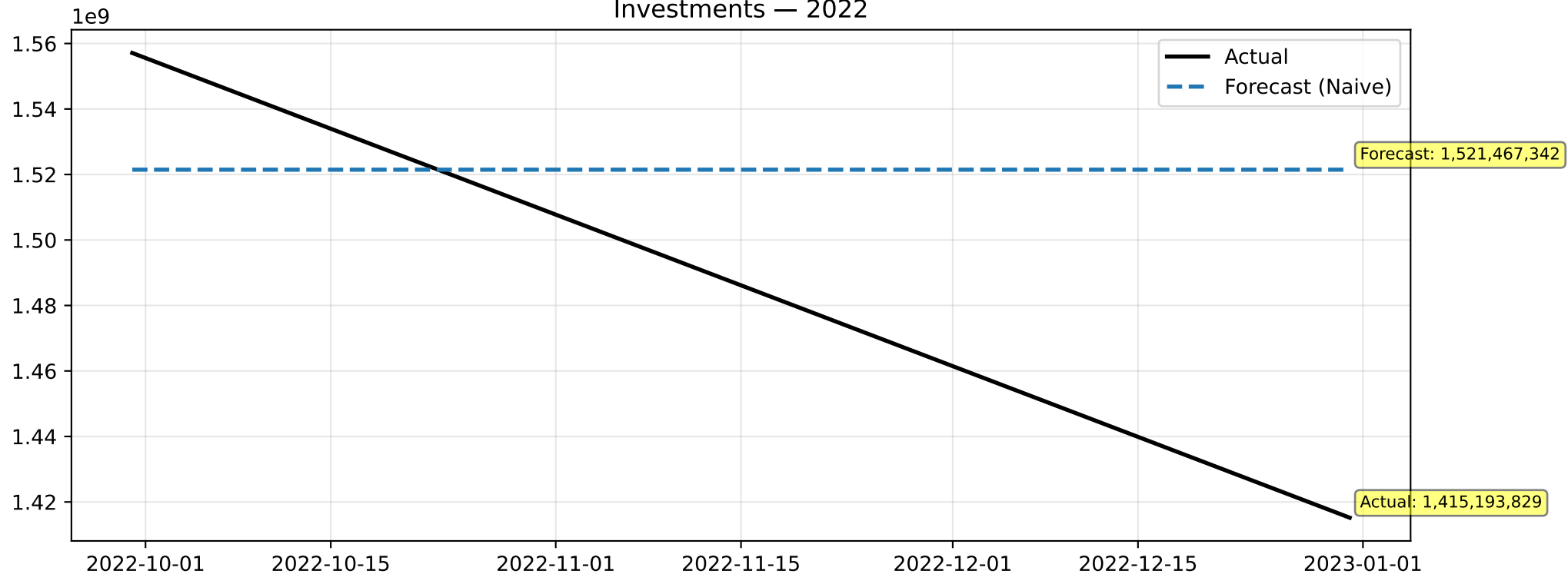


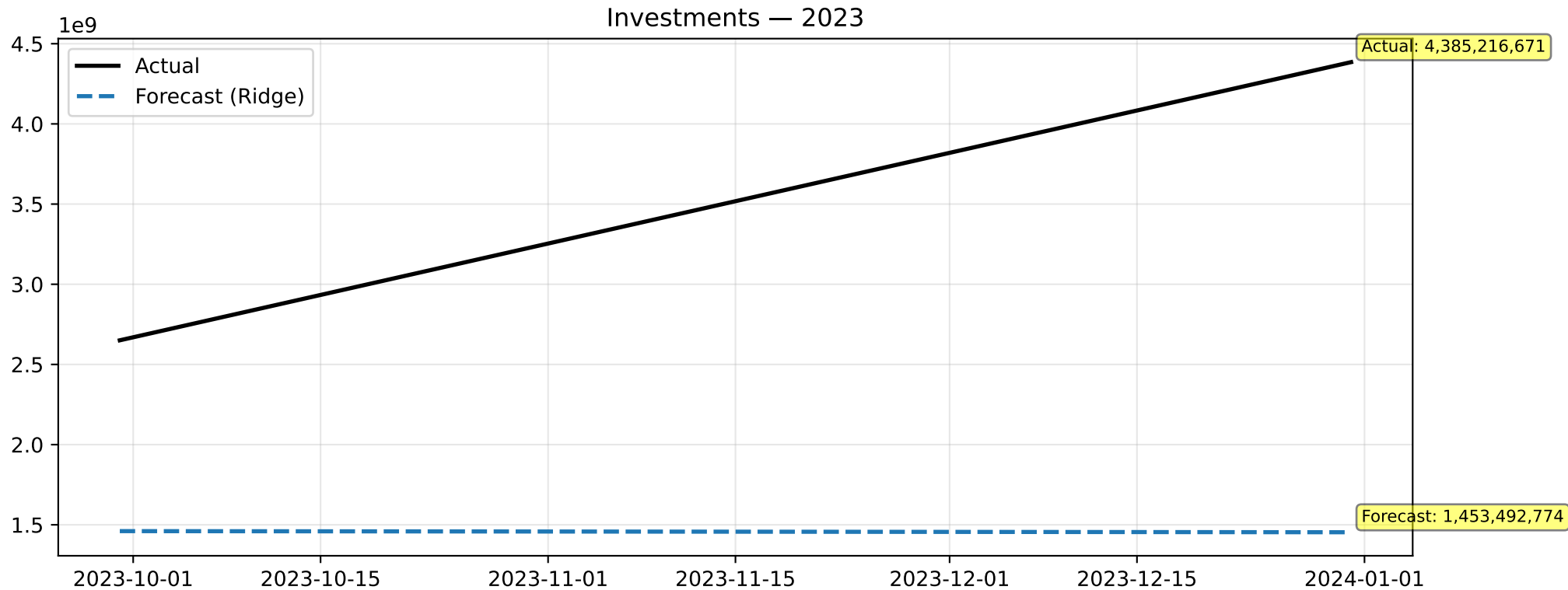
Investments — 2020



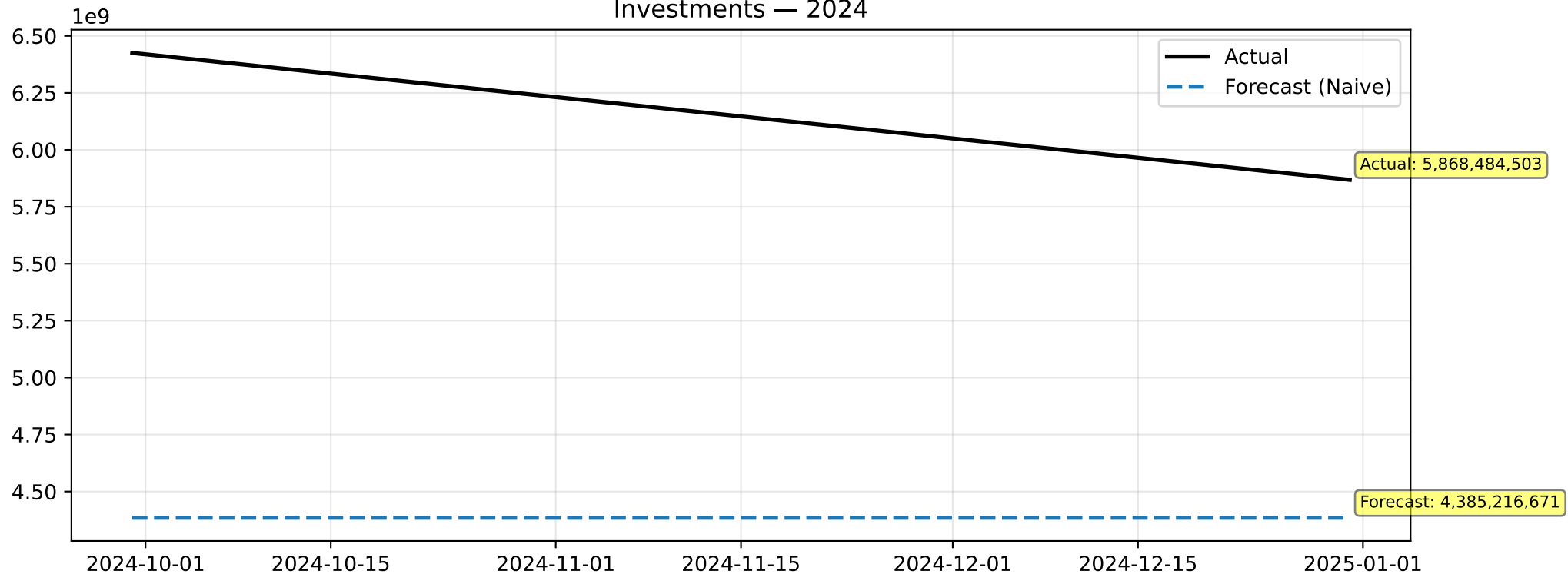


Investments — 2022

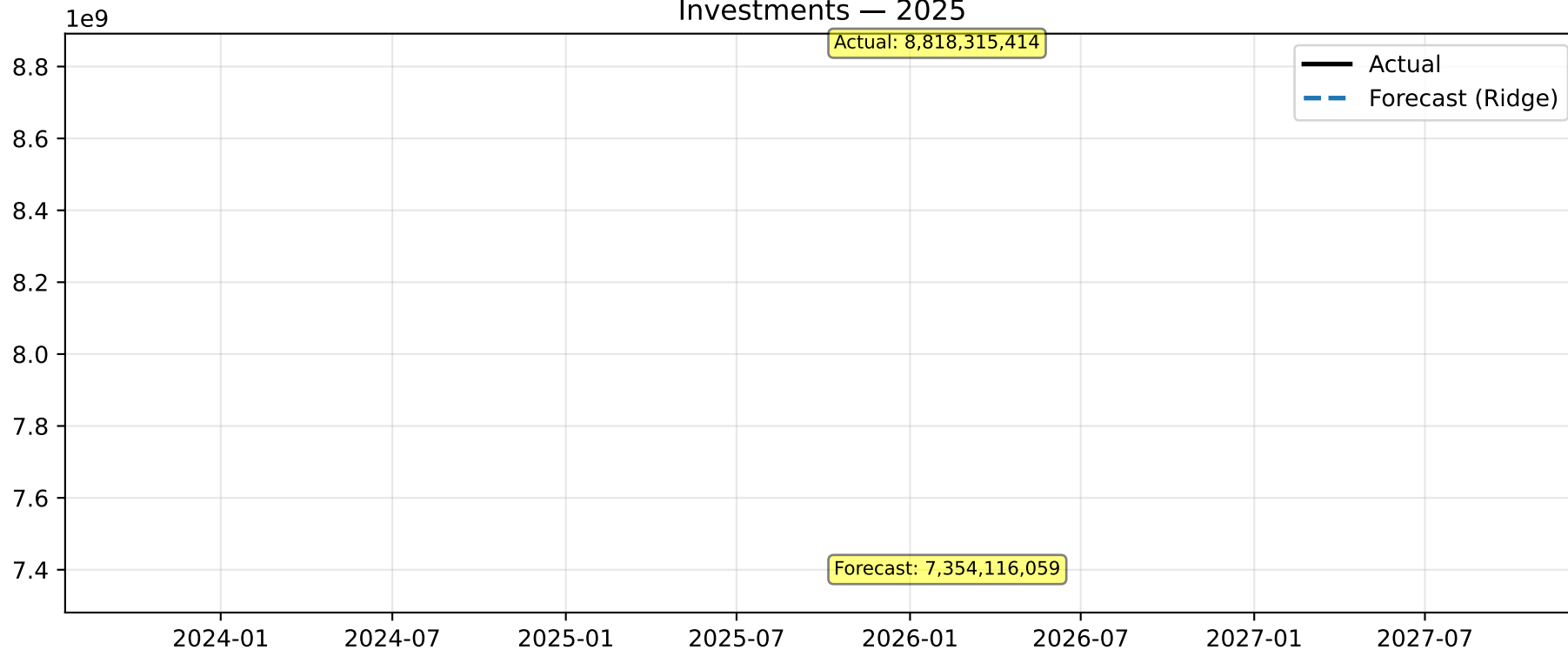




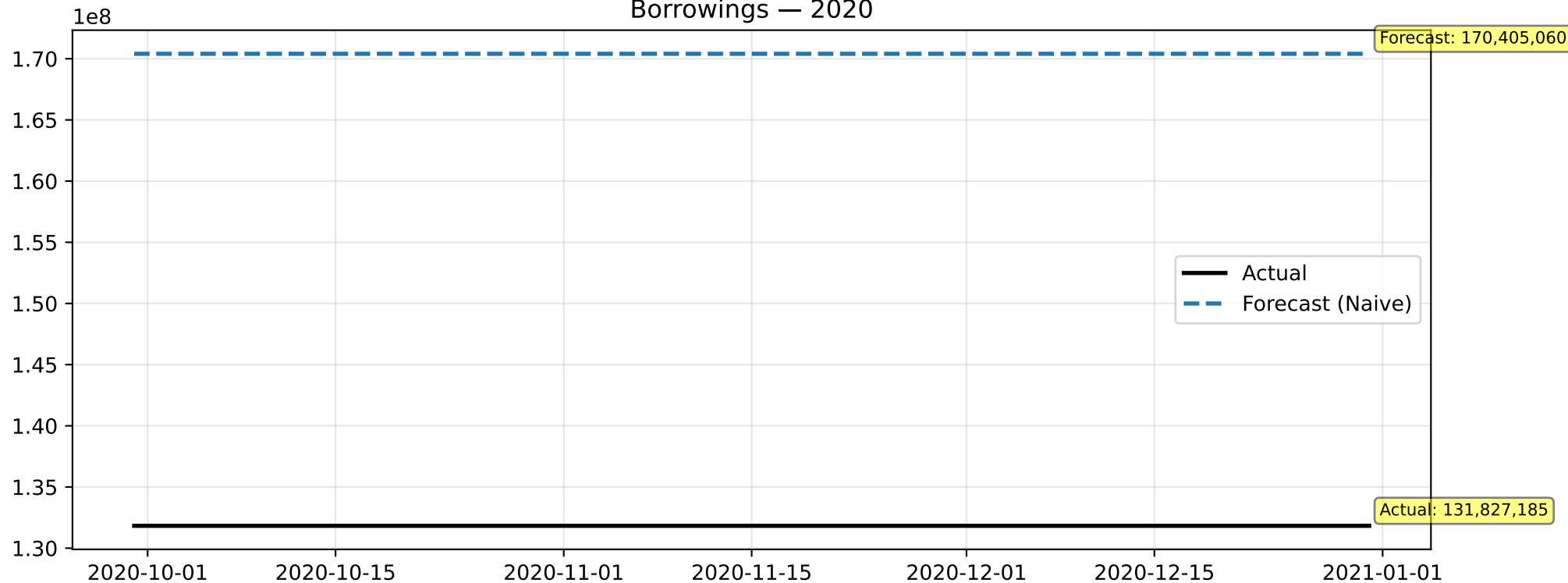
Investments — 2024



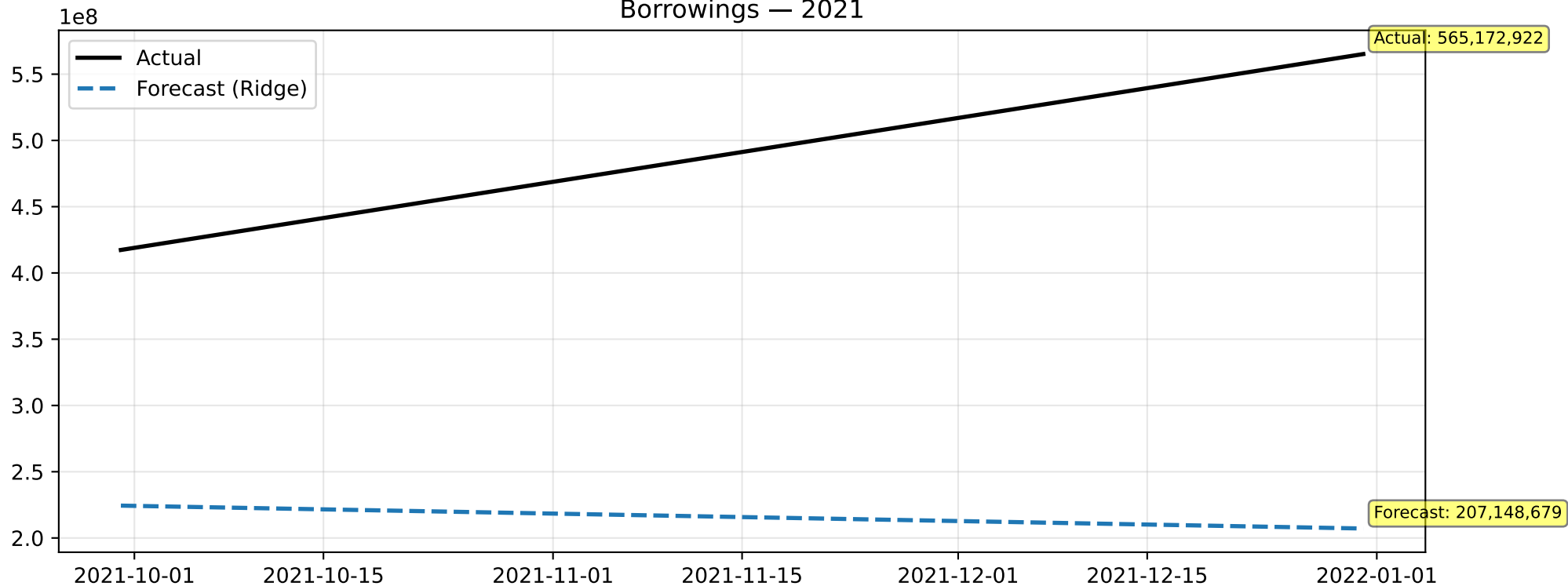
Investments — 2025



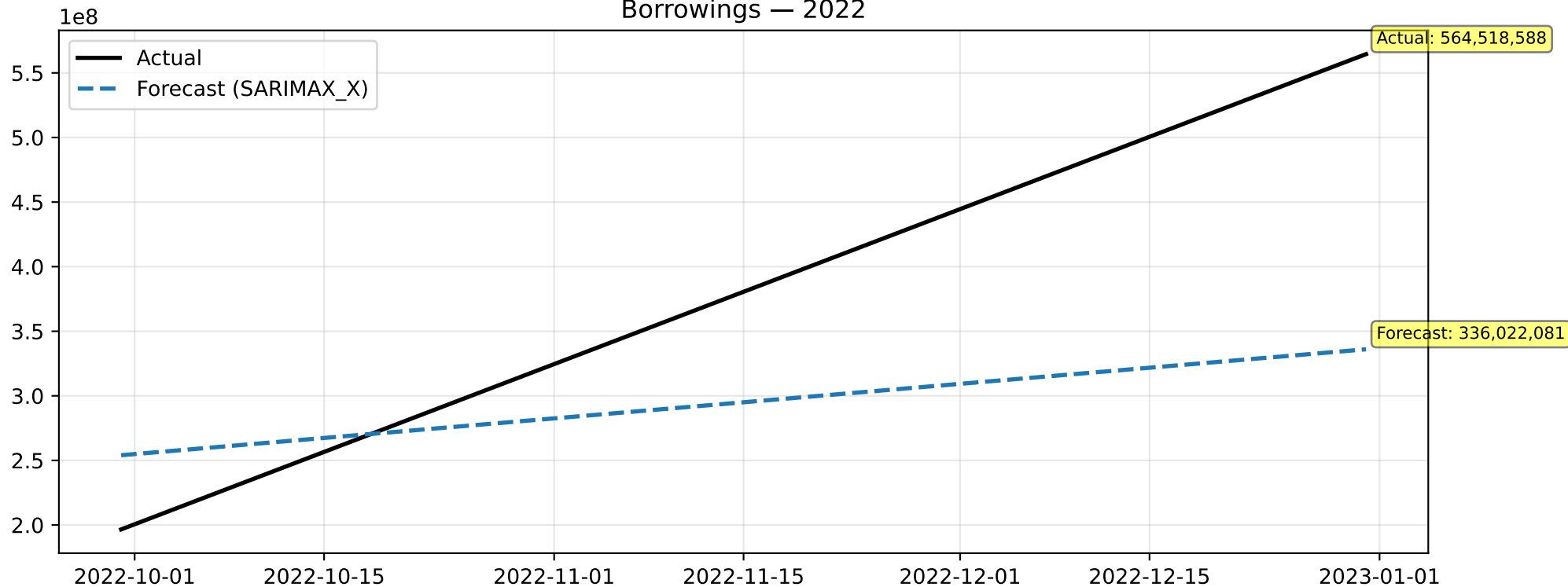
Borrowings — 2020

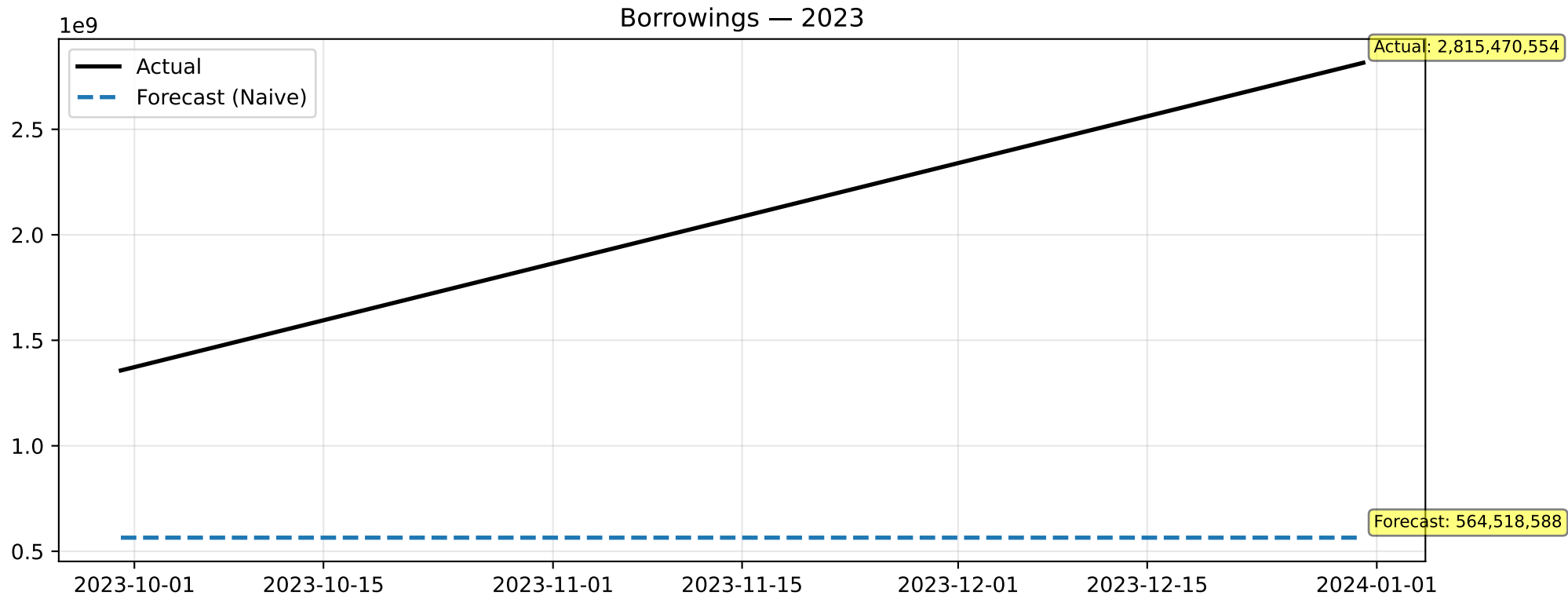


Borrowings — 2021

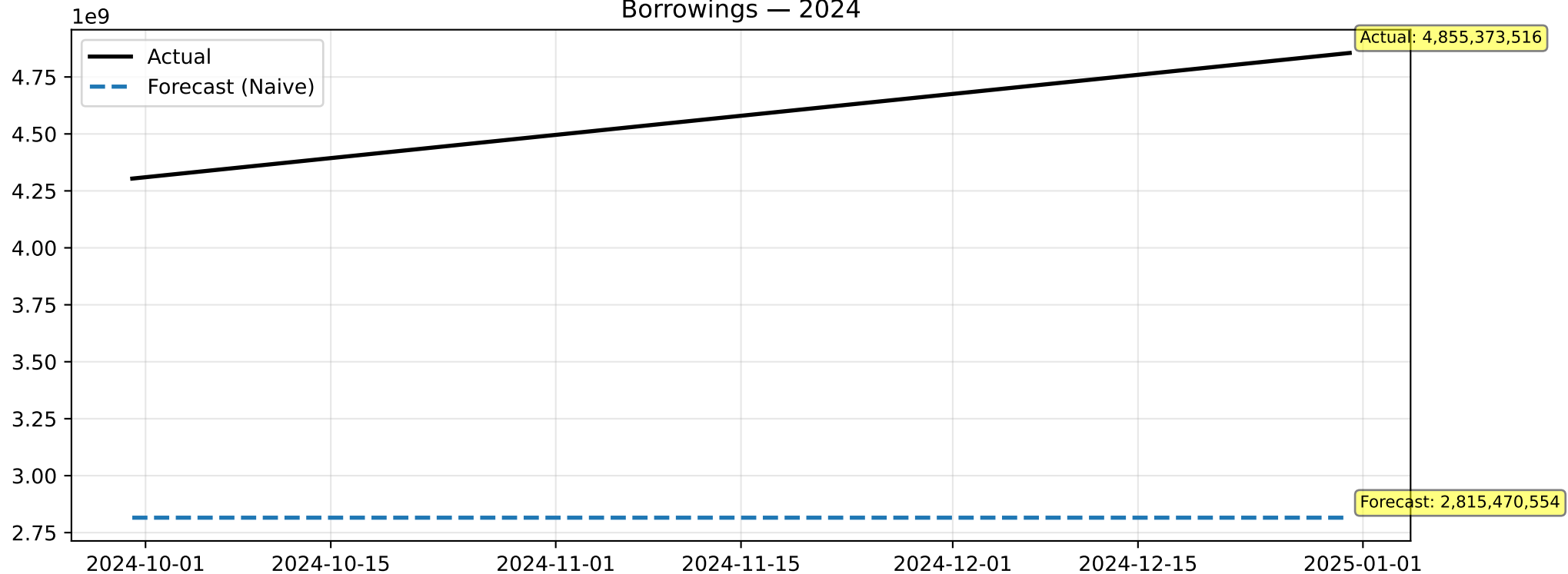


Borrowings — 2022

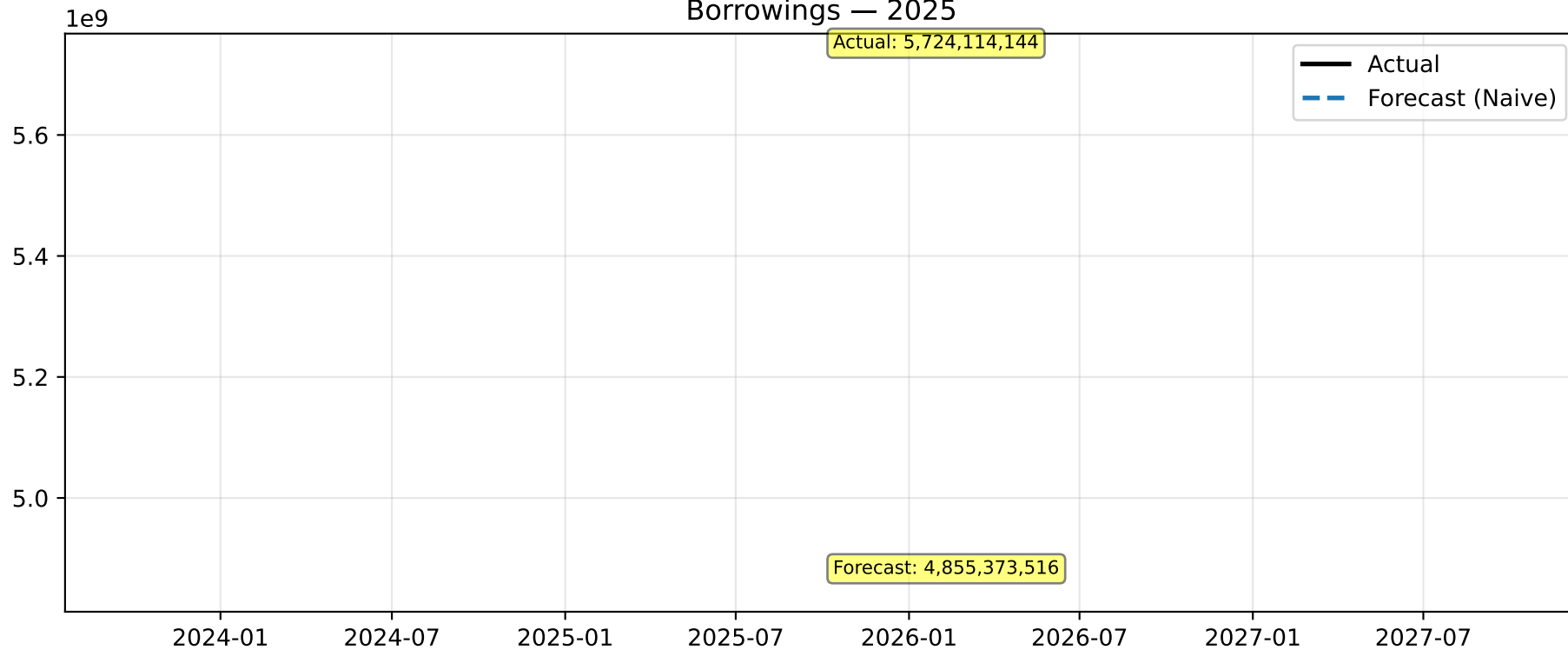


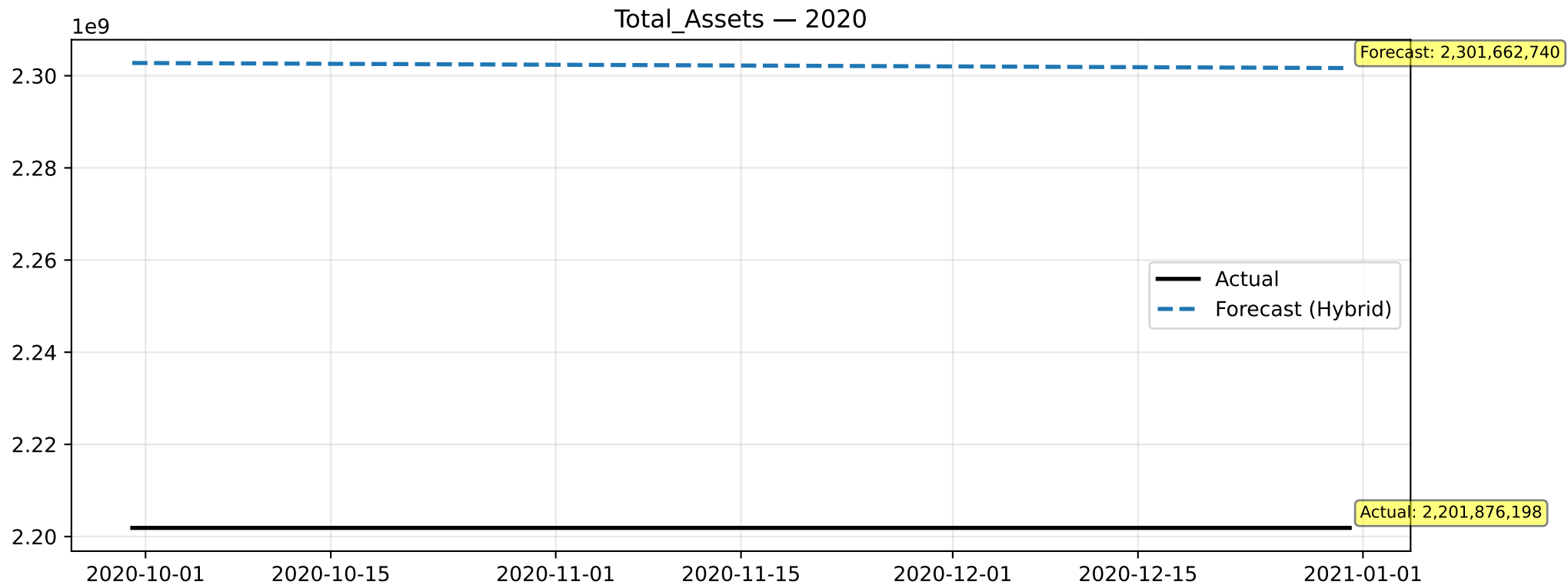


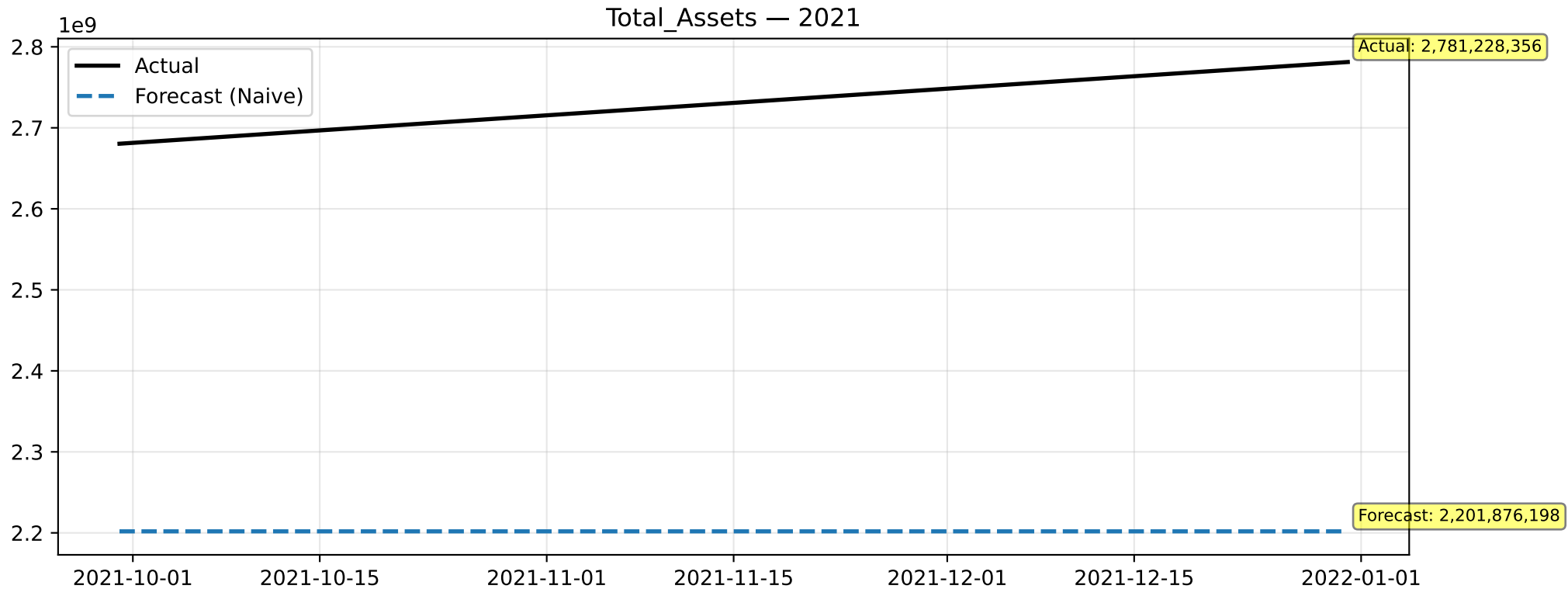
Borrowings — 2024

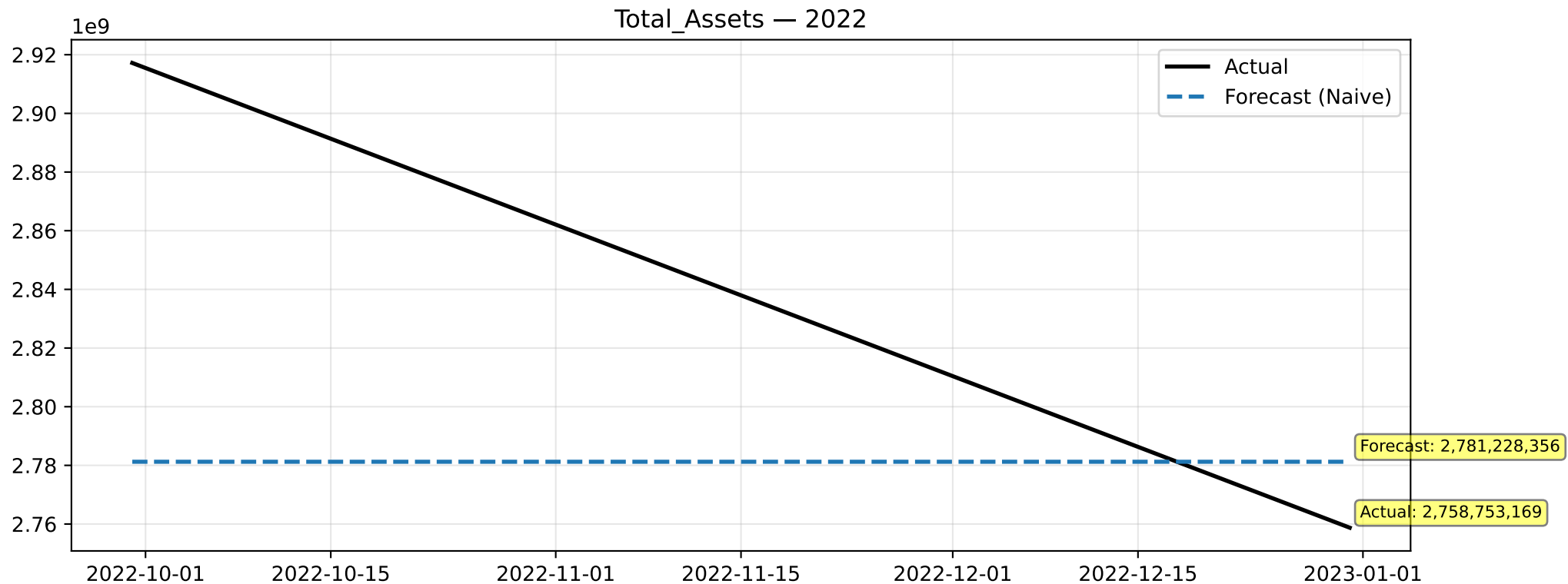


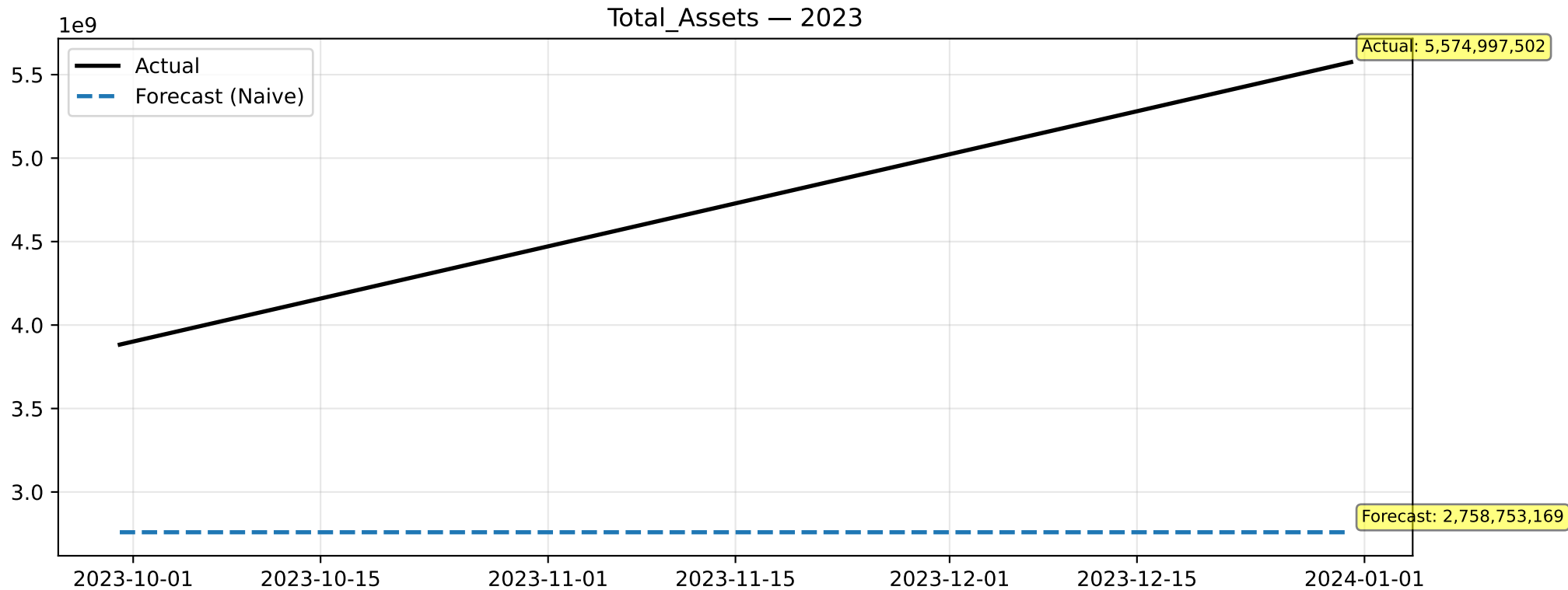
Borrowings — 2025

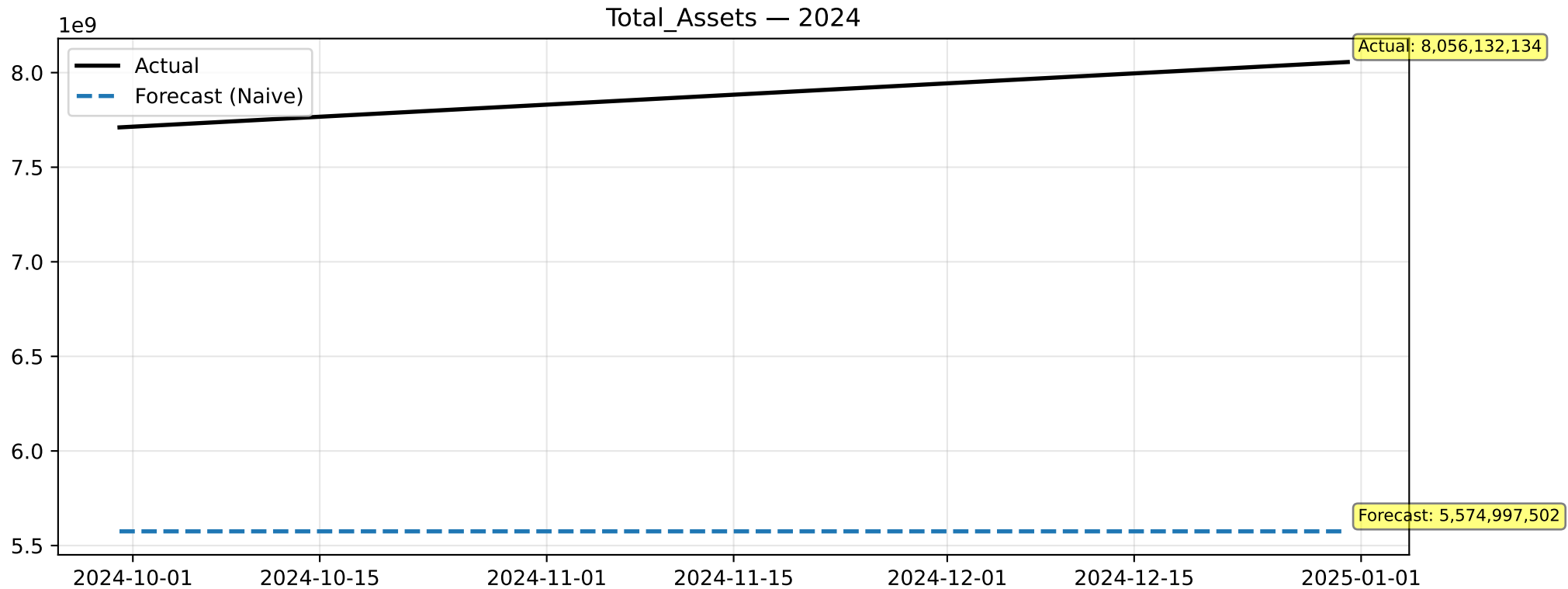


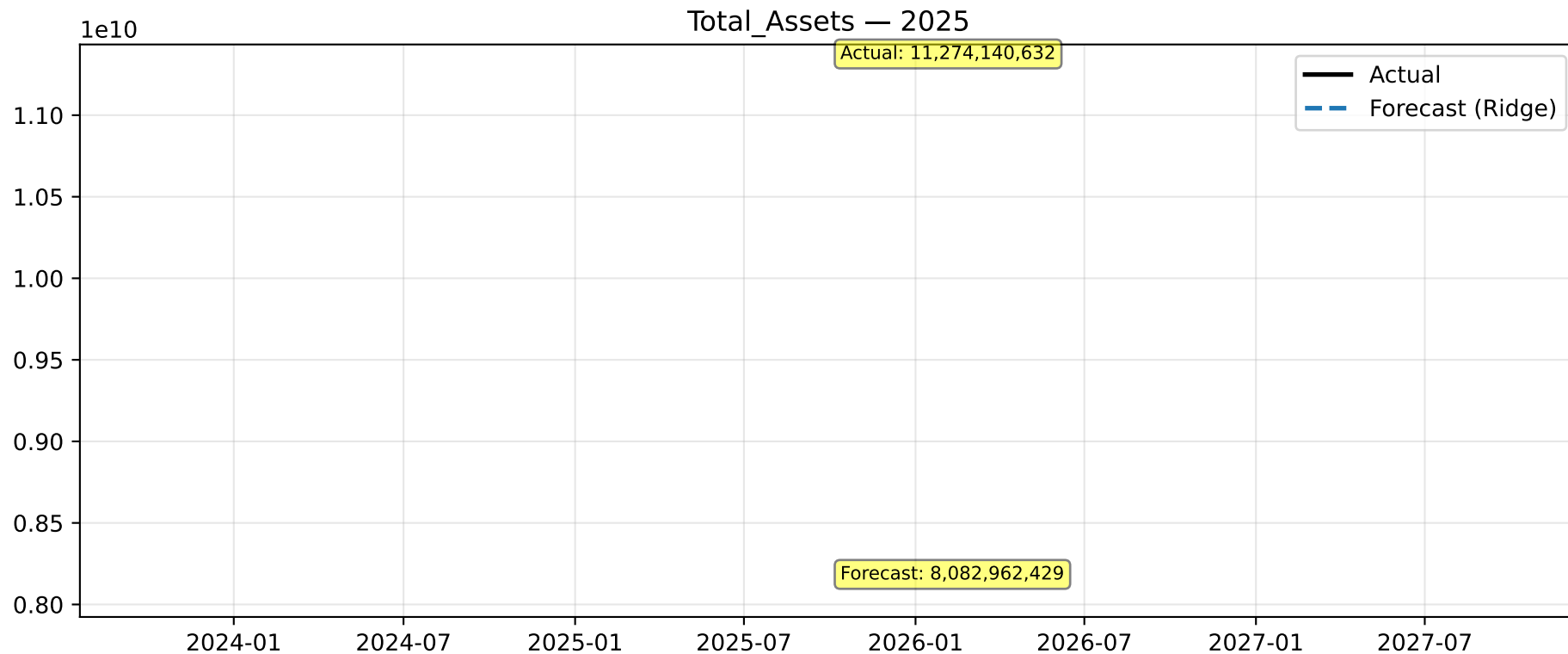




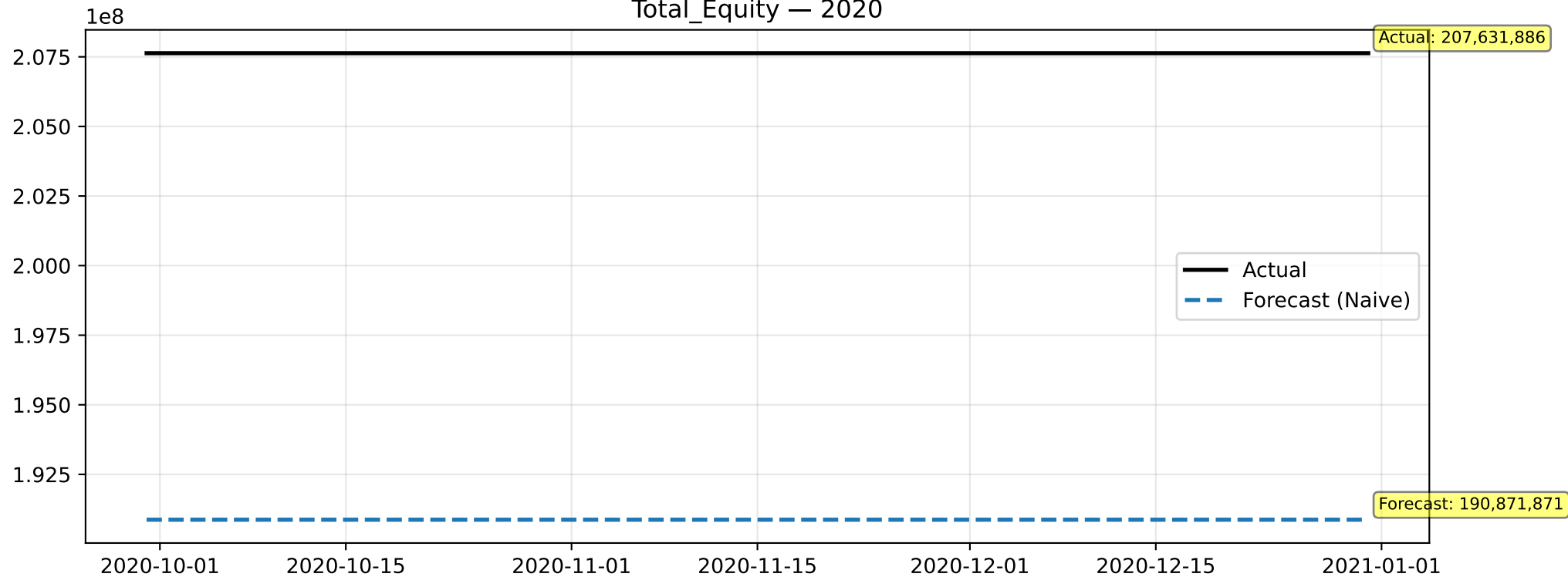




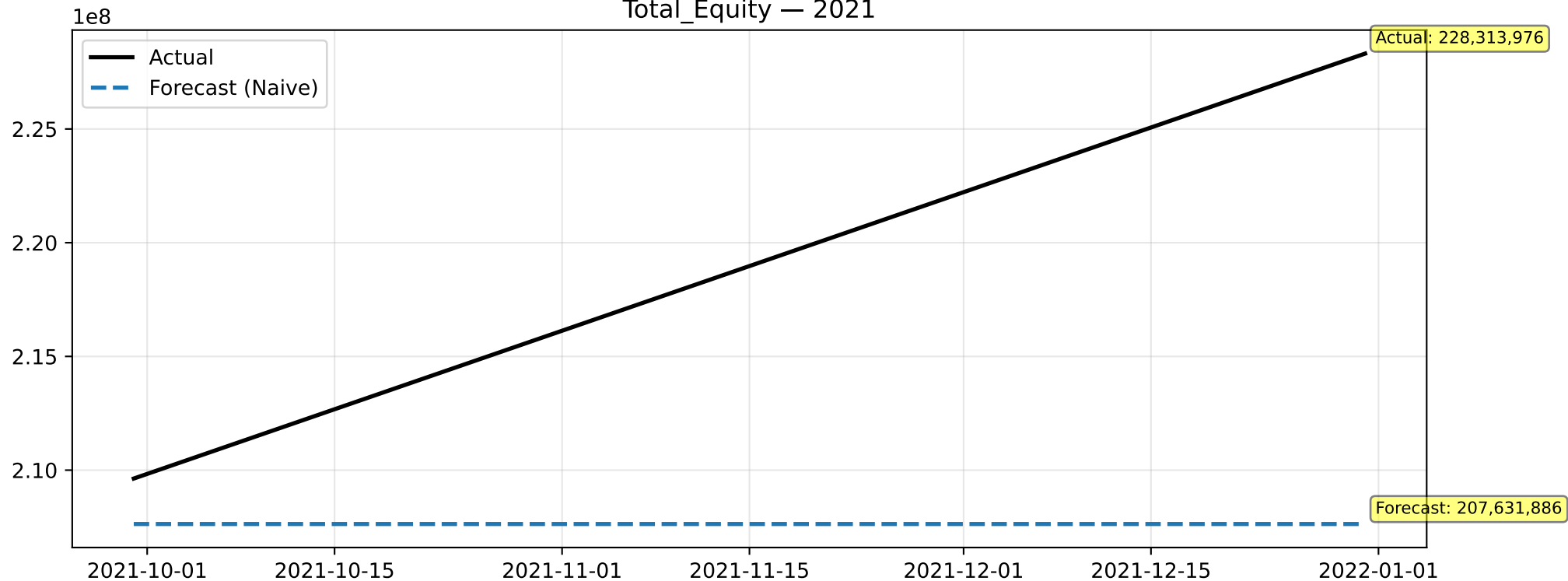




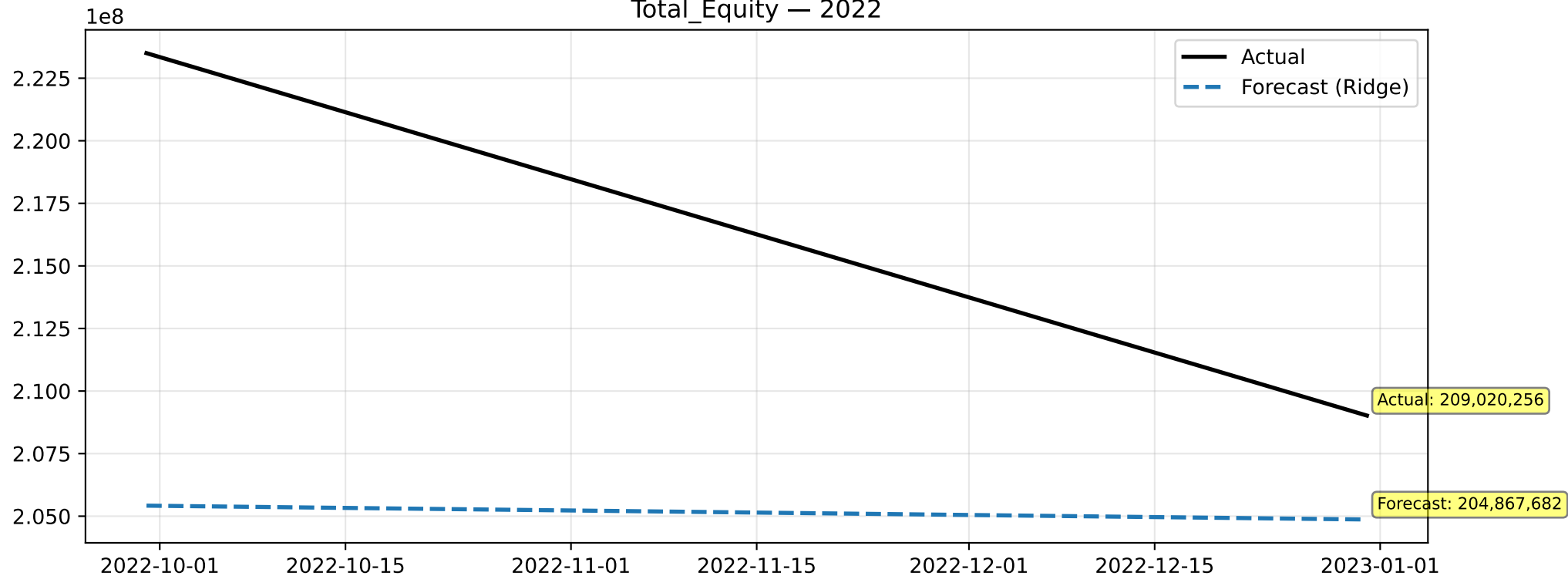
Total_Equity — 2020

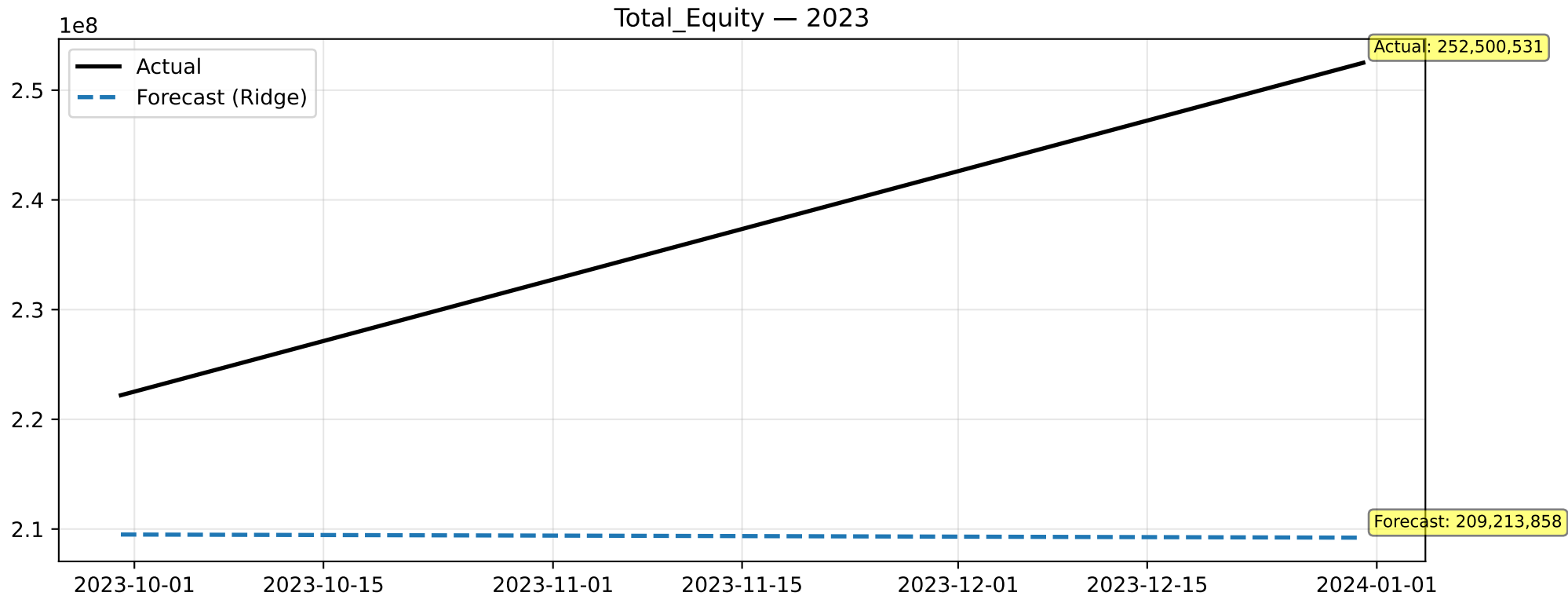


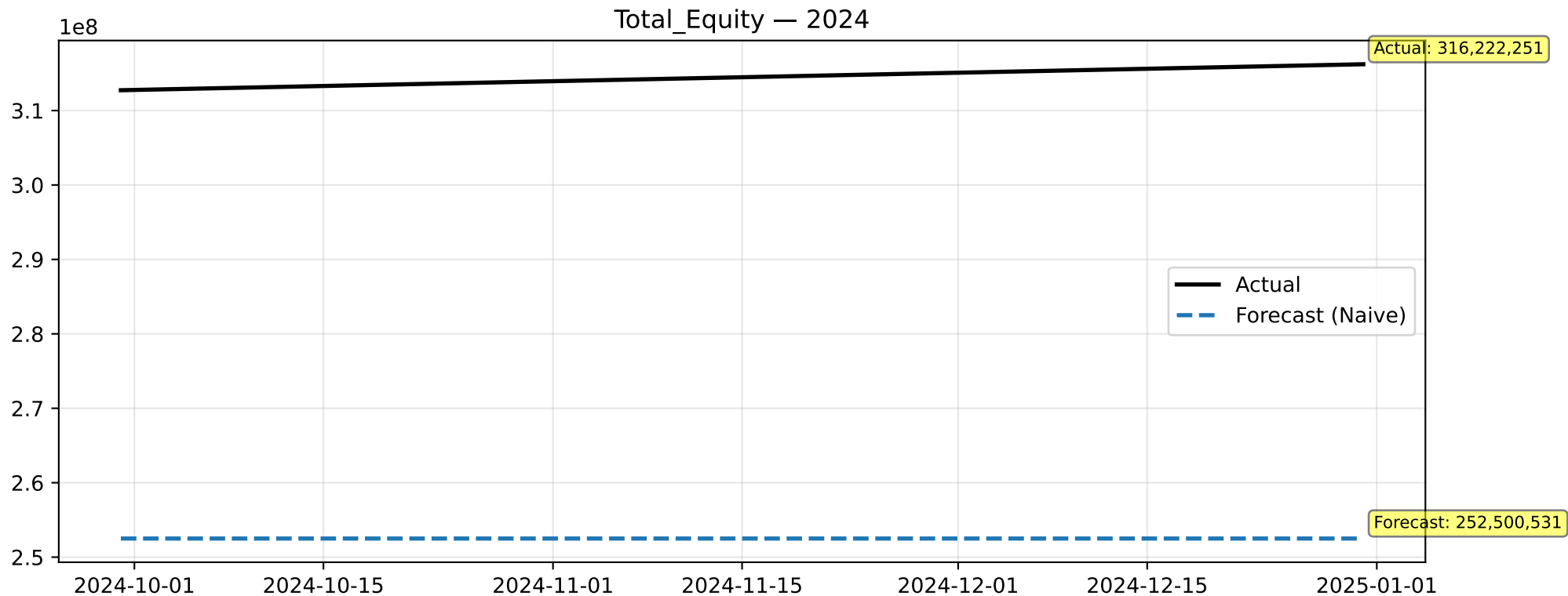
Total_Equity — 2021

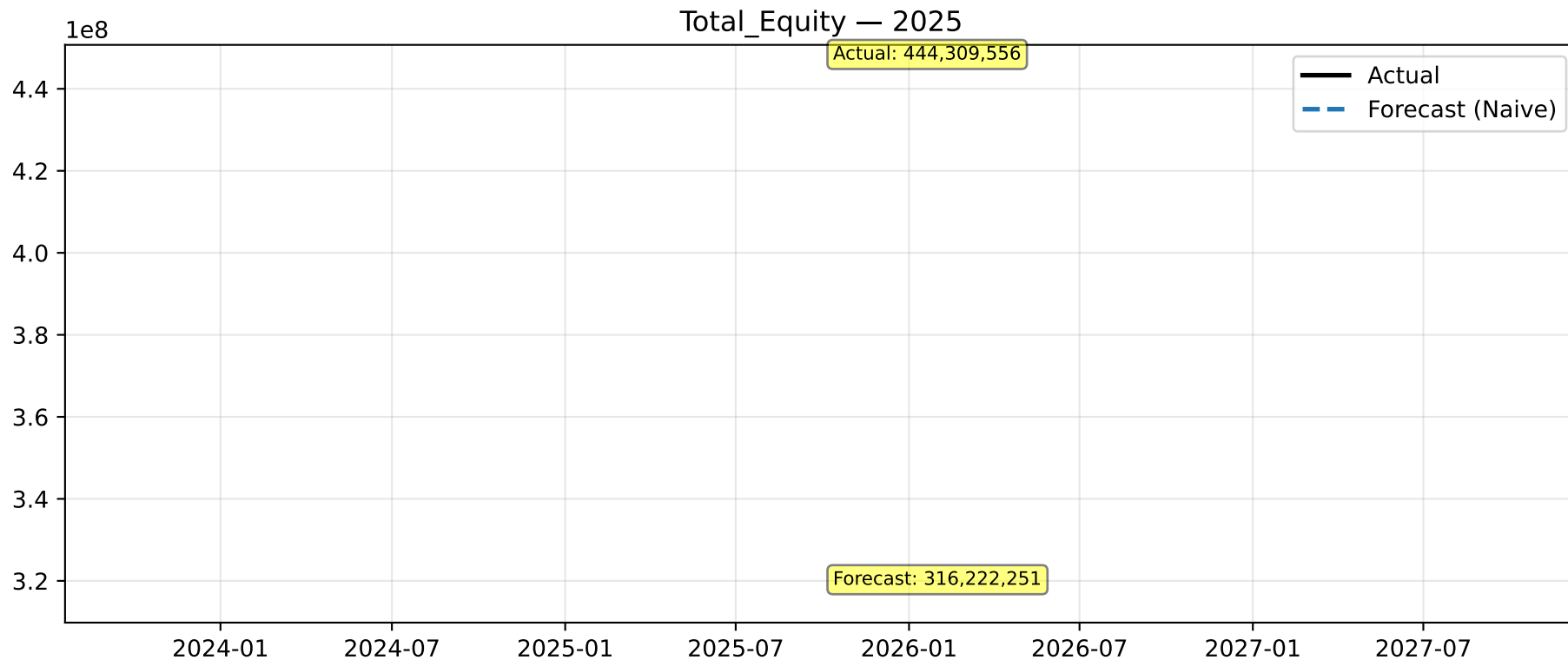


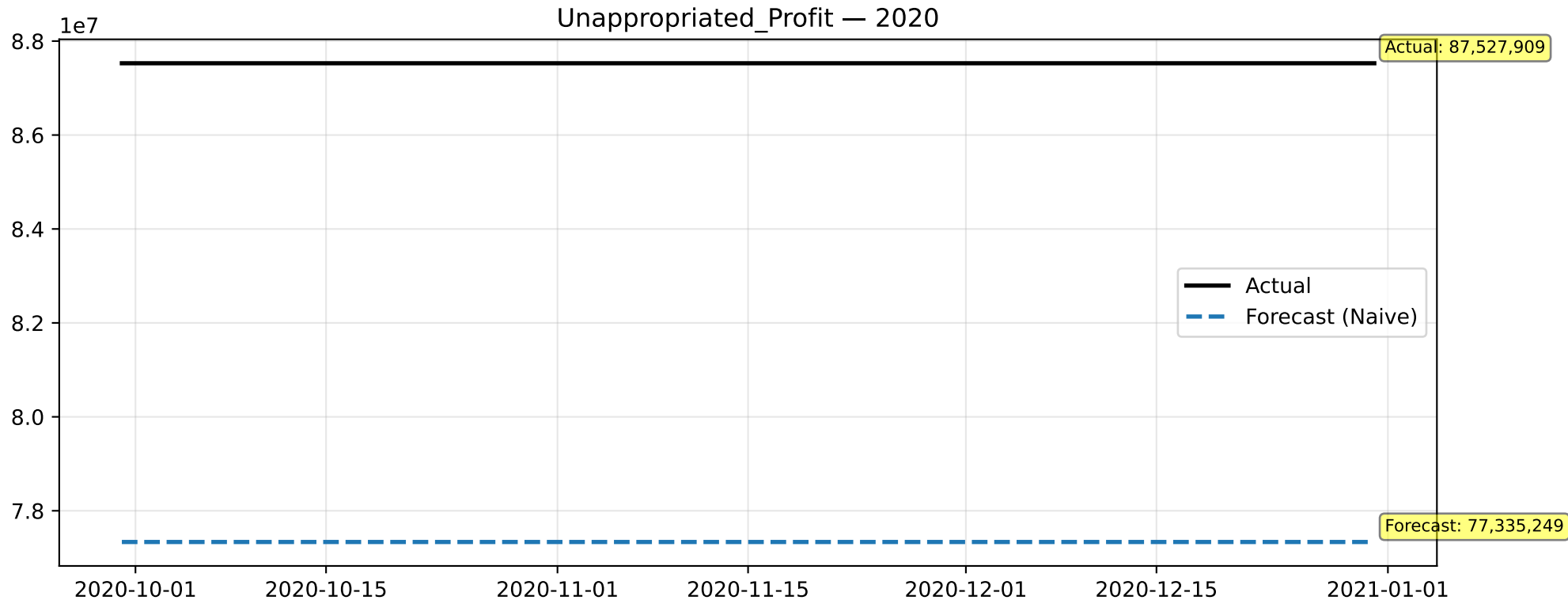
Total_Equity — 2022

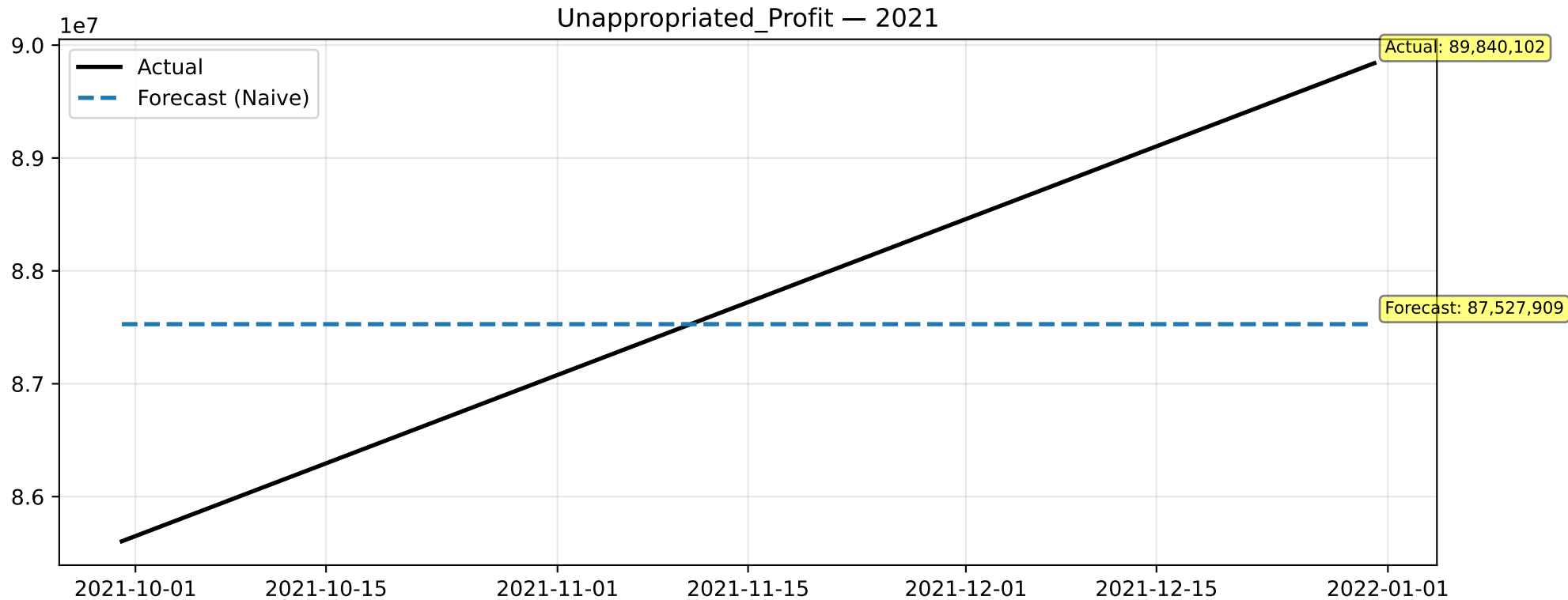


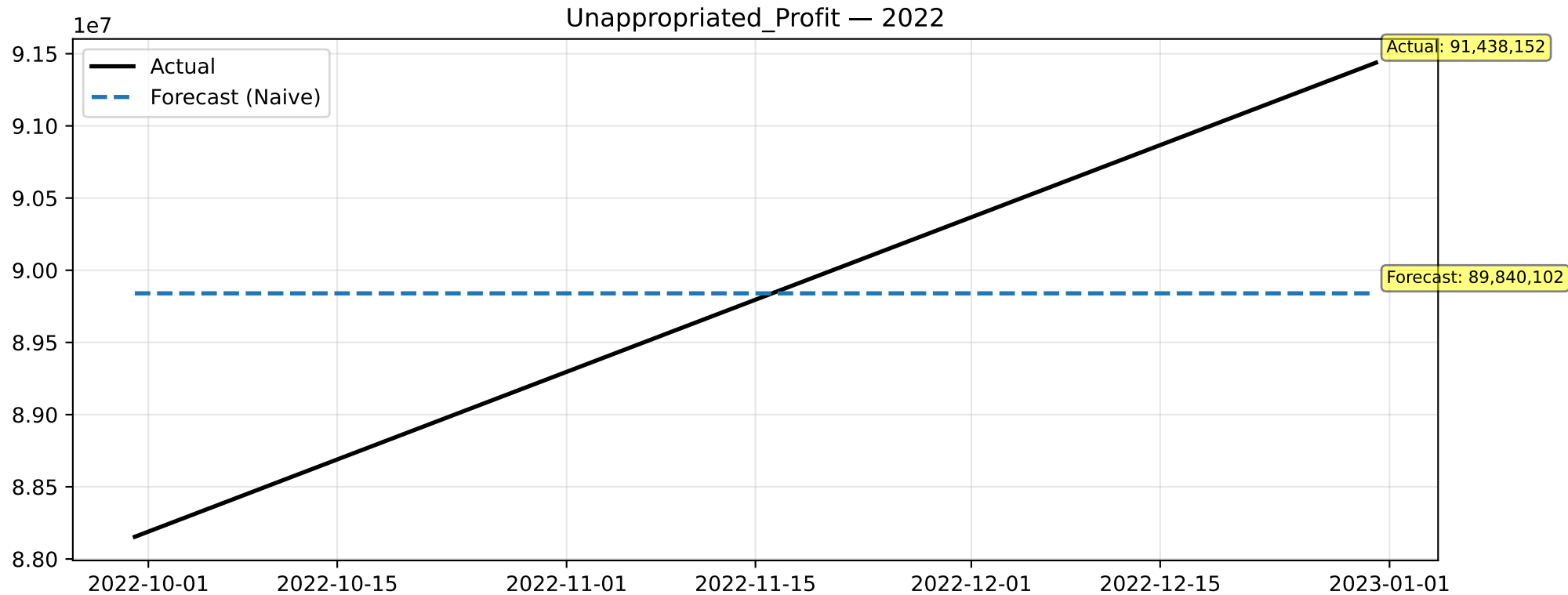


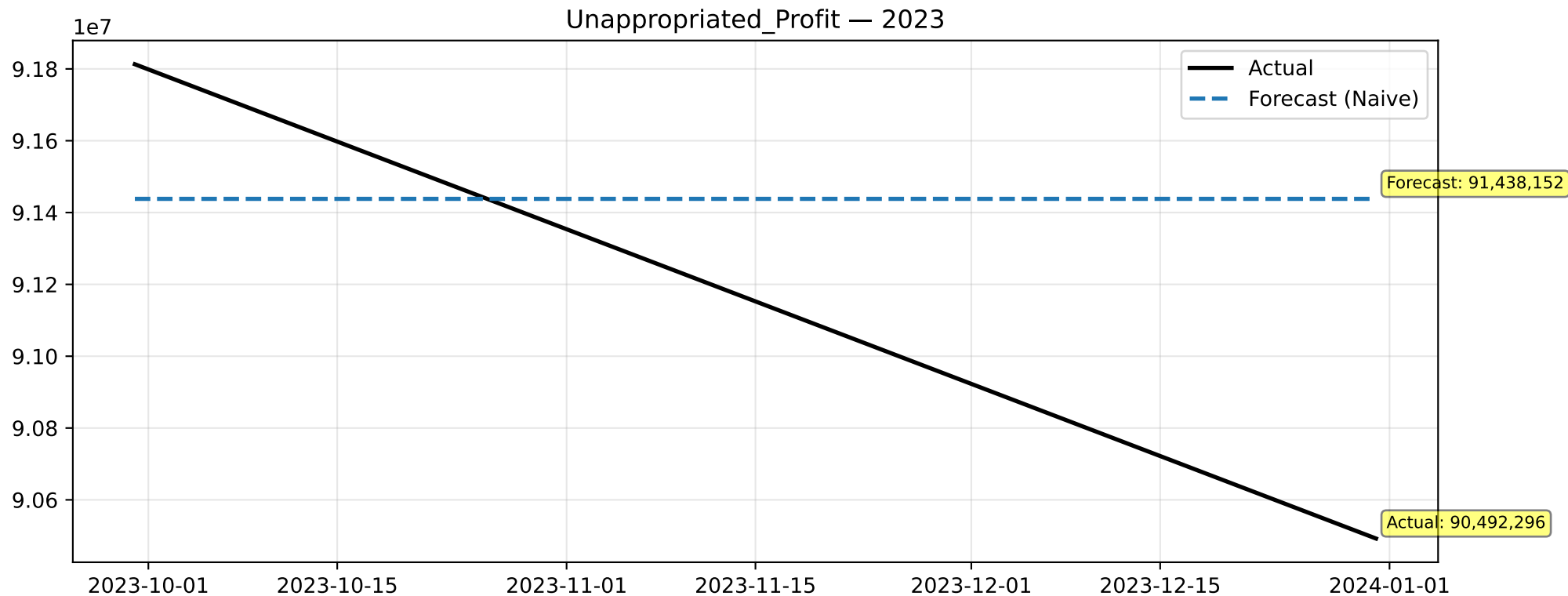


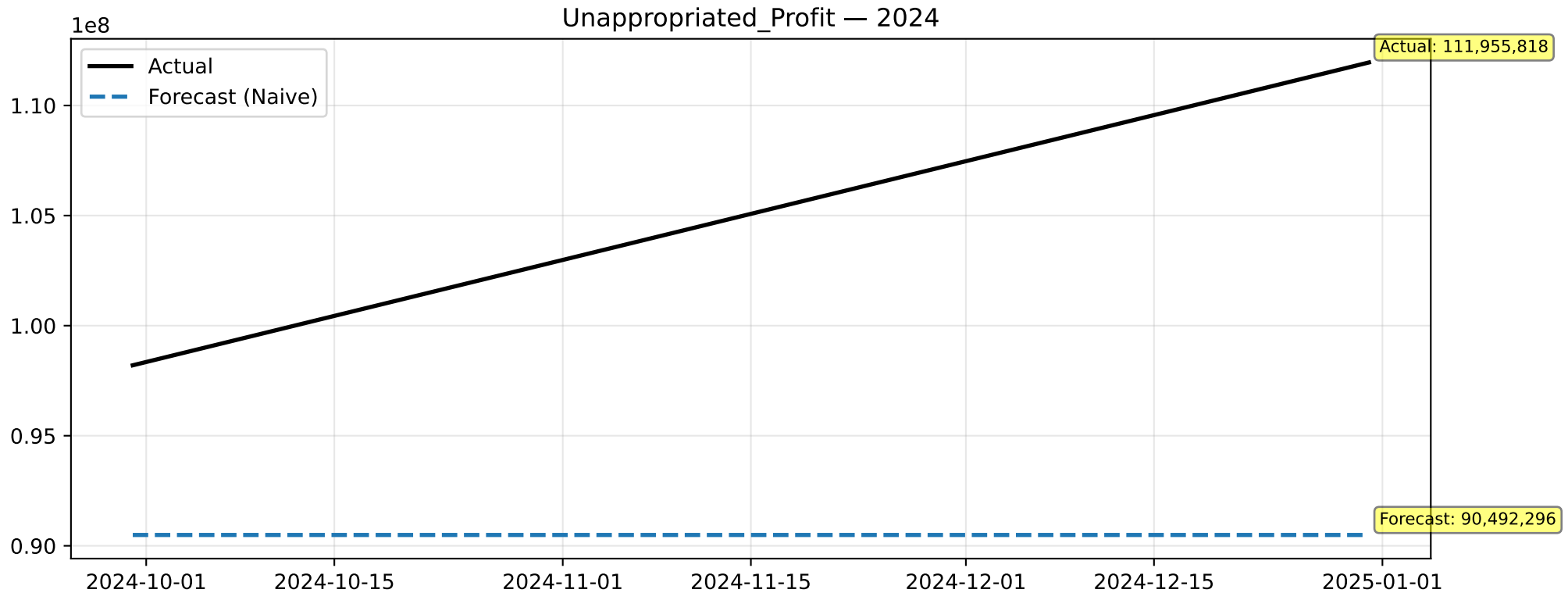


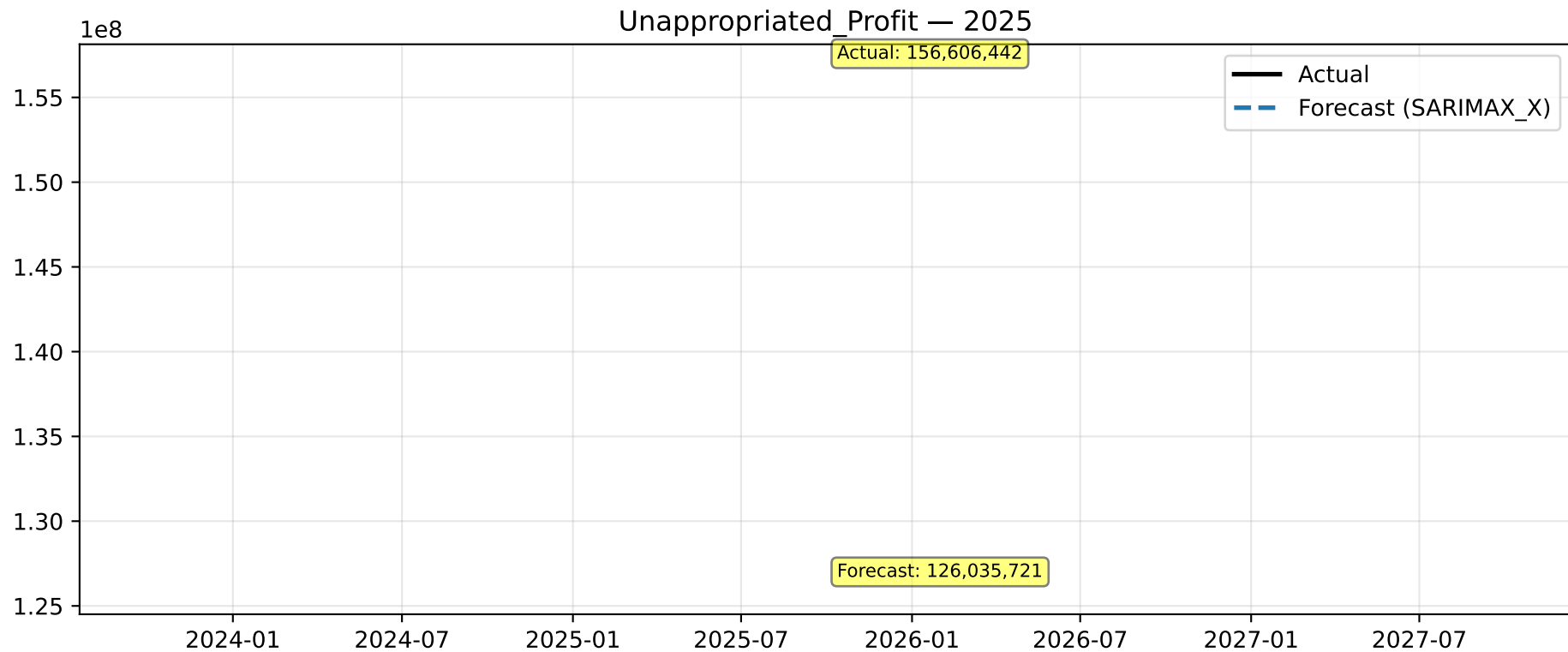












Year 2020

- Deposits: actual 1,764,392,286, forecast 1,557,995,306 (abs error 11.7%, model=Naive)
- Advances: actual 611,851,676, forecast 682,446,328 (abs error 11.5%, model=Ridge)
- Investments: actual 1,167,803,012, forecast 1,272,157,212 (abs error 8.9%, model=Hybrid)
- Borrowings: actual 131,827,185, forecast 170,405,060 (abs error 29.3%, model=Naive)
- Total_Assets: actual 2,201,876,198, forecast 2,301,662,740 (abs error 4.5%, model=Hybrid)
- Total_Equity: actual 207,631,886, forecast 190,871,871 (abs error 8.1%, model=Naive)
- Unappropriated_Profit: actual 87,527,909, forecast 77,335,249 (abs error 11.6%, model=Naive)

Year 2021

- Deposits: actual 1,885,771,572, forecast 1,764,392,286 (abs error 6.4%, model=Naive)
- Advances: actual 766,781,120, forecast 649,293,307 (abs error 15.3%, model=Ridge)
- Investments: actual 1,521,467,342, forecast 1,167,803,012 (abs error 23.2%, model=Naive)
- Borrowings: actual 565,172,922, forecast 207,148,679 (abs error 63.3%, model=Ridge)
- Total_Assets: actual 2,781,228,356, forecast 2,201,876,198 (abs error 20.8%, model=Naive)
- Total_Equity: actual 228,313,976, forecast 207,631,886 (abs error 9.1%, model=Naive)
- Unappropriated_Profit: actual 89,840,102, forecast 87,527,909 (abs error 2.6%, model=Naive)

Year 2022

- Deposits: actual 1,838,366,814, forecast 1,827,805,128 (abs error 0.6%, model=Hybrid)
- Advances: actual 921,837,095, forecast 858,861,728 (abs error 6.8%, model=Hybrid)
- Investments: actual 1,415,193,829, forecast 1,521,467,342 (abs error 7.5%, model=Naive)
- Borrowings: actual 564,518,588, forecast 336,022,081 (abs error 40.5%, model=SARIMAX_X)
- Total_Assets: actual 2,758,753,169, forecast 2,781,228,356 (abs error 0.8%, model=Naive)
- Total_Equity: actual 209,020,256, forecast 204,867,682 (abs error 2.0%, model=Ridge)
- Unappropriated_Profit: actual 91,438,152, forecast 89,840,102 (abs error 1.7%, model=Naive)

Year 2023

- Deposits: actual 2,341,017,855, forecast 1,971,288,278 (abs error 15.8%, model=Ridge)
- Advances: actual 613,565,526, forecast 731,292,682 (abs error 19.2%, model=Ridge)
- Investments: actual 4,385,216,671, forecast 1,453,492,774 (abs error 66.9%, model=Ridge)
- Borrowings: actual 2,815,470,554, forecast 564,518,588 (abs error 79.9%, model=Naive)
- Total_Assets: actual 5,574,997,502, forecast 2,758,753,169 (abs error 50.5%, model=Naive)
- Total_Equity: actual 252,500,531, forecast 209,213,858 (abs error 17.1%, model=Ridge)
- Unappropriated_Profit: actual 90,492,296, forecast 91,438,152 (abs error 1.0%, model=Naive)

Year 2024

- Deposits: actual 2,640,211,498, forecast 2,341,017,855 (abs error 11.3%, model=Naive)
- Advances: actual 1,443,941,946, forecast 613,565,526 (abs error 57.5%, model=Naive)
- Investments: actual 5,868,484,503, forecast 4,385,216,671 (abs error 25.3%, model=Naive)
- Borrowings: actual 4,855,373,516, forecast 2,815,470,554 (abs error 42.0%, model=Naive)
- Total_Assets: actual 8,056,132,134, forecast 5,574,997,502 (abs error 30.8%, model=Naive)
- Total_Equity: actual 316,222,251, forecast 252,500,531 (abs error 20.2%, model=Naive)
- Unappropriated_Profit: actual 111,955,818, forecast 90,492,296 (abs error 19.2%, model=Naive)

Year 2025

- Deposits: actual 4,768,789,701, forecast 3,091,883,737 (abs error 35.2%, model=SARIMAX_X)
- Advances: actual 1,103,393,866, forecast 1,297,916,005 (abs error 17.6%, model=Hybrid)
- Investments: actual 8,818,315,414, forecast 7,354,116,059 (abs error 16.6%, model=Ridge)
- Borrowings: actual 5,724,114,144, forecast 4,855,373,516 (abs error 15.2%, model=Naive)
- Total_Assets: actual 11,274,140,632, forecast 8,082,962,429 (abs error 28.3%, model=Ridge)
- Total_Equity: actual 444,309,556, forecast 316,222,251 (abs error 28.8%, model=Naive)
- Unappropriated_Profit: actual 156,606,442, forecast 126,035,721 (abs error 19.5%, model=SARIMAX_X)