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Gold crash scenarios for EA stress tests: 20 years of data

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Abstract

A stress test needs real bad days to replay. In daily XAUUSD data from 2005 to 2024 we find the worst falls and rises over 1 to 20 trading days and how far price went against a position opened at a daily close. The worst week was April 2013 (−14.33% in 5 days) and the worst two weeks October 2008 (−20.71%); rises were as large (+14.81% in 5 days, September 2008). Intraday was worse than the close: a long opened on 12 April 2013 was 9.80% under water at the next day's low, and the worst 20-day case was 25.37%. With gold exposure of about 4.3 times equity, the worst 10-day case in these 20 years takes the whole account; at about 10.2 times, one day is enough.

Keywords: gold; XAUUSD; stress testing; drawdown; crash scenarios; leverage

JEL: G01; G11; G17

Highlights

- **The worst week was in April 2013.** Gold fell 14.33% in 5 trading days, from 1,573.53 on 8 Apr to 1,348.00 on 15 Apr 2013. The worst single day, −9.06%, was the last day of that week.
- **The worst two weeks were in October 2008.** Gold fell 20.71% in 10 trading days, from 913.00 on 9 Oct to 723.90 on 23 Oct 2008.
- **Rises were as large as falls.** The best 5-day rise was +14.81% (10 to 17 Sep 2008) and the best 20-day rise was +22.17%. A short or grid EA needs the same test the other way.
- **Intraday is worse than the close.** A long opened at the close on 12 Apr 2013 was 9.80% under water at the next day's low. Over 20 trading days, the worst case was 25.37% (entry 9 Oct 2008).
- **Exposure decides survival.** With gold exposure of about 4.3 times account equity, the worst 10-day case in these 20 years takes the whole account. At about 10.2 times, one day is enough.

1. Introduction

A stress test needs real bad days to replay. We searched 20 years of daily gold (XAUUSD) data, 2005 to 2024, for the worst falls and rises over 1 to 20 trading days, the widest single days, and how far price went against a position opened at a daily close.

2. Data and method

Method

1. **Data:** daily XAUUSD bars from the public dataset "xauusd-gold-price-historical-data-2004-2025" on Hugging Face (file XAU_1d_data.jsonl), the same dataset and the same day rules as note 08. It is broker-style MetaTrader data.
2. **Windows:** close-to-close moves over 1, 3, 5, 10 and 20 trading days, ending from 3 Jan 2005 to 31 Dec 2024. 5,138 one-day windows. Windows that cross a data hole (more than 4 calendar days between bars: late Nov 2005 and late Nov 2006) are left out. For the top lists, a window that overlaps one already picked is skipped.
3. **MAE:** entry at each daily close; worst low (long) or high (short) over the next N bars, as a % of the entry close. Entries whose hold would pass 31 Dec 2024 are left out.

4. **Drawdowns:** fall from a closing high to the lowest close before a new closing high.

5. **Limits:** one source, not checked against a second. Bar times are broker server time. Daily bars show the high and low but not their order within the day, and no ticks, spreads or gaps inside the day. The worst case in the future can be larger than the worst case in these 20 years; the data ends in 2024. Every number here comes from our own script.

3. Results

Worst falls and best rises, 1 to 20 days

Close-to-close moves over N trading days, XAUUSD, 2005-2024

Days	Worst fall	Dates	Best rise	Dates	1 in 100 worse than
1	-9.06%	12–15 Apr 2013	+10.99%	16–17 Sep 2008	-3.09%
3	-13.47%	10–15 Apr 2013	+12.89%	12–17 Sep 2008	-4.98%
5	-14.33%	8–15 Apr 2013	+14.81%	10–17 Sep 2008	-6.43%
10	-20.71%	9–23 Oct 2008	+17.26%	11–25 Sep 2008	-8.82%
20	-19.87%	9 Oct–6 Nov 2008	+22.17%	11 Sep–9 Oct 2008	-11.59%

Dates are the close the window starts from and the close it ends on. The last column is the 1st percentile of all windows of that length: only 1 window in 100 fell further. The worst 20-day fall is a little smaller than the worst 10-day fall because gold recovered part of the October 2008 drop within 20 days.

A scenario list to replay

The script also lists the five worst and five best windows of each length that do not overlap. The same few periods come back again and again. These are the dates to load into the strategy tester first:

- **April 2013 fall:** 8 to 15 Apr 2013, -14.33% in 5 days; 1 to 15 Apr 2013, -15.72% in 10 days.
- **October 2008 fall:** 15 to 22 Oct 2008, -13.96% in 5 days; 9 to 23 Oct 2008, -20.71% in 10 days.
- **June 2006 fall:** 7 to 14 Jun 2006, -10.93% in 5 days; 16 May to 14 Jun 2006, -18.83% in 20 days.
- **March 2020 fall:** 9 to 16 Mar 2020, -10.07% in 5 days.
- **September 2011 fall:** 21 to 28 Sep 2011, -9.75% in 5 days.
- **June 2013 fall:** 13 to 27 Jun 2013, -13.34% in 10 days.
- **September 2008 rise:** 10 to 17 Sep 2008, +14.81% in 5 days; 11 Sep to 9 Oct 2008, +22.17% in 20 days.
- **March 2020 rise:** 19 to 26 Mar 2020, +10.49% in 5 days.

Falls of 5% or more in 10 days were not rare: 4.68% of all 10-day windows had one. Falls of 10% or more in 20 days came in 1.48% of 20-day windows.

The widest single days

Widest high-to-low ranges, XAUUSD, 2005-2024

Date	High	Low	Range	Close move
17 Sep 2008	868.10	777.00	11.71% (US\$91.10)	+10.99%
10 Oct 2008	931.10	826.60	11.45% (US\$104.50)	−6.94%
15 Apr 2013	1,495.57	1,337.09	10.69% (US\$158.48)	−9.06%
24 Oct 2008	747.50	681.40	9.13% (US\$66.10)	+1.28%
24 Jun 2016	1,358.25	1,250.34	8.59% (US\$107.91)	+4.75%

Range is high minus low as a % of the previous close. On 24 Oct 2008 the day closed only 1.28% up, but price had moved 9.13% from low to high. A test that only uses daily closes misses days like this.

How far price goes against a position

Here we opened an imaginary long and an imaginary short at every daily close from 2005 to 2024 and held each for N trading days. For each one we took the worst point: the lowest low (for the long) or the highest high (for the short) before the end of the hold. This is the maximum adverse excursion, or MAE. It is what an open position, or a grid basket opened at that close, would have shown on the equity line.

Maximum adverse excursion from the entry close, XAUUSD, 2005-2024

Hold	Long: typical	1 in 20	1 in 100	Worst	Short: worst
1 day	−0.53%	−2.21%	−3.86%	−9.80%	+11.58%
3 days	−0.96%	−3.84%	−6.55%	−15.34%	+16.93%
5 days	−1.23%	−4.85%	−8.35%	−16.63%	+21.73%
10 days	−1.73%	−6.65%	−11.96%	−23.50%	+21.73%
20 days	−2.43%	−8.72%	−16.48%	−25.37%	+23.67%

"Typical" is the median. "1 in 20" and "1 in 100" are the 5th and 1st percentiles: only 5% or 1% of entries saw a worse point. The worst long entries were 12 Apr 2013 (1 day), 11 Apr 2013 (3 days), 9 Apr 2013 (5 days) and 9 Oct 2008 (10 and 20 days). The worst short entries were 16 Sep 2008 (1 and 3 days) and 11 Sep 2008 (5, 10 and 20 days).

Held for 20 trading days, 20.30% of long entries were at some point 5% or more under water. For shorts the share was 31.38%; gold rose over these 20 years.

The long slide: gold's own drawdowns

A long-only EA that holds for months also meets slow falls. The largest falls of gold from a closing high, 2005 to 2024:

- **−44.64%:** from 1,899.54 on 5 Sep 2011 to 1,051.55 on 17 Dec 2015. Gold closed at or above the old high again only on 24 Jul 2020, 3,245 calendar days after the peak.
- **−29.23%:** from 1,004.10 on 17 Mar 2008 to 710.60 on 12 Nov 2008. Back above the high on 11 Sep 2009.
- **−21.84%:** from 714.20 on 12 May 2006 to 558.20 on 14 Jun 2006, in 33 calendar days. Back above the high on 17 Sep 2007.

- **-21.37%:** from 2,063.25 on 6 Aug 2020 to 1,622.40 on 26 Sep 2022. Back above the high on 1 Dec 2023.

4. Discussion

What a move does to an account

The loss on an account is the price move times the exposure. Exposure here means the value of the gold position divided by account equity:

exposure = lots × ounces per lot × gold price ÷ account equity

Example: 0.01 lot × 100 oz × 2,624.61 (the last close of 2024 in this data) ÷ US\$10,000 = 0.26 times equity. Check your own broker's contract size; 100 oz per lot is common but not universal. At that exposure the worst 1-day long case (−9.80%) would cost 2.57% of the account, US\$257.21.

The table uses the worst long MAE from above, so it includes intraday lows. A grid or martingale EA that adds positions as price falls has growing exposure; use the exposure at the worst point of the basket, not at the first trade.

Account loss in the worst long case, by exposure

Hold	Worst MAE	1x	2x	5x	10x	Account gone at
1 day	−9.80%	9.8%	19.6%	49.0%	98.0%	10.2x
3 days	−15.34%	15.3%	30.7%	76.7%	100%	6.5x
5 days	−16.63%	16.6%	33.3%	83.1%	100%	6.0x
10 days	−23.50%	23.5%	47.0%	100%	100%	4.3x
20 days	−25.37%	25.4%	50.7%	100%	100%	3.9x

Simple arithmetic: loss = exposure × move, capped at 100%. It leaves out spread, swap, slippage and the broker's stop-out level, which make a real result worse. A broker usually closes positions before equity reaches zero. For a short, the worst cases give account gone at 8.6x (1 day), 5.9x (3 days), 4.6x (5 and 10 days) and 4.2x (20 days).

How to run this test on your own EA

1. **Get daily data.** Use the same broker data you trade on, or the public dataset named below. Check for holes: we skip any step where the bar before is more than 4 calendar days earlier.
2. **Find the bad windows.** For 1, 3, 5, 10 and 20 trading days, compute close-to-close moves and list the worst falls and best rises that do not overlap.
3. **Replay those dates.** Run the EA in the strategy tester on each window, with real ticks if you have them, and a few weeks of lead-in so the EA has positions open when the move starts.
4. **Read the equity line, not the balance.** Record the lowest equity and the margin level at that point. An EA can close a window in profit after coming close to a stop-out.
5. **Check exposure at the worst point.** Multiply the exposure at that moment by the worst MAE for the hold time your EA uses. If the result is near 100%, the EA does not survive a repeat.
6. **Add the other stresses.** Gaps, wider spreads, delay and small rule changes are covered in How to stress-test a gold EA for crash scenarios.

Appendix

Related notes

- Single-day moves, how often a day moves 2%, 3% or 5%, and the typical range: XAUUSD largest daily moves: 20 years of gold data.
- Moves of 9% or more, including 30 January 2026, after this data ends: Gold's largest one-day moves.
- Monday opens away from Friday's close: Gold weekend gaps: how often, how big.
- Why a good backtest can still lose live: Why an EA backtest is profitable but the live account loses.

FAQ

What crash scenarios should a gold EA be tested on?

Start with the worst windows in history. In this data they were 8 to 15 Apr 2013 (−14.33% in 5 days), 9 to 23 Oct 2008 (−20.71% in 10 days), June 2006 and March 2020, plus the September 2008 rise (+14.81% in 5 days) for short and grid EAs.

What was gold's largest fall in one week?

In daily data from 2005 to 2024, the worst 5-trading-day fall was −14.33%, from 1,573.53 on 8 Apr 2013 to 1,348.00 on 15 Apr 2013.

How far can gold move against a position in a few days?

Half of all longs opened at a daily close were no more than 1.23% under water within 5 days. 1 in 100 went 8.35% or more against the position. The worst case was 16.63%, for a long opened on 9 Apr 2013.

How do I turn a gold move into an account loss?

Multiply the move by your exposure: lots × ounces per lot × price ÷ equity. At 5 times equity, the worst 10-day case here (−23.50%) is more than the whole account.

References

- XAUUSD daily data: Hugging Face, ZombitX64/xauusd-gold-price-historical-data-2004-2025 (file XAU_1d_data.jsonl, revision ff6469dc, downloaded 18 Oct 2026). The dataset card names the Kaggle dataset "novandraanugrah/xauusd-gold-price-historical-data-2004-2024" as its source.

Declarations

- **Author:** Huyen X. Vu, Quantex Research, AlgoTrade Pte. Ltd., Singapore (ORCID 0000-0002-2209-842X).
- **Data availability:** Daily XAUUSD prices from a public dataset (Hugging Face, ZombitX64/xauusd-gold-price-historical-data-2004-2025), as described in the Method section. Our calculation files are available on request.
- **Use of AI tools:** Data processing, analysis code and drafting were assisted by AI tools (Claude, Anthropic). The author checked the results and is responsible for the content.
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