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XAUUSD average daily range: 20 years of gold data by year and month

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Abstract

How far does gold move from high to low in a normal day? On 5,138 trading days from 2005 to 2024 the mean daily XAUUSD range was 1.520% of price (median 1.279%). The year mattered most: 2008 averaged 2.878% and 2018 0.966%, almost three times less, while the month made little difference (March 1.629%, July 1.408%). Wide days were common: 20.2% of days spanned 2% or more. On 4.0% of days the range was at least twice the average of the 14 days before, with a peak of 6.78 times on 15 April 2013.

Keywords: gold; XAUUSD; daily range; volatility; volatility clustering

JEL: G14; Q02

Highlights

- **The average day spans 1.520% of price.** That was US\$19.78 on average. The median day was 1.279% (US\$16.65). Half of all days fell between 0.925% and 1.819%.
- **The year matters most.** The widest year was 2008 with a mean range of 2.878%; the quietest was 2018 at 0.966%. The wide year moved 2.98 times as much. In US\$ the average day grew from US\$5.27 in 2005 to US\$33.04 in 2024, mostly because the gold price rose.
- **The month matters little.** March was the widest month (1.629%, 1.07 times the average day) and July the quietest (1.408%, 0.93 times).
- **Big days are common.** 20.2% of days had a range of 2% or more, and 6.2% had 3% or more.
- **Range can jump fast.** On 4.0% of days (about one in 25) the range was at least twice the average of the 14 days before. The largest jump was 6.78 times, on 15 Apr 2013.

1. Introduction

How far does gold move from high to low in a normal day, and how much does that change? We measured the daily range of XAUUSD on 5,138 trading days from 3 Jan 2005 to 31 Dec 2024 and grouped it by size, by year and by month. We also checked how often a day is much wider than the two weeks before it.

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 file as notes 08 and 09. Window 3 Jan 2005 to 31 Dec 2024. 2004 is a part year and 2025 has long gaps, so both are left out.
2. **Days used:** a day counts only if the bar before it is at most 4 calendar days earlier. 2 days were skipped for data holes (November 2005 and November 2006). 5,138 days were used, the same days as note 08.
3. **Daily range:** high minus low of the daily bar, as a % of the previous bar's close, and in US\$. The median (1.279%, US\$16.65) matches note 08.

4. **True range:** the higher of high and previous close, minus the lower of low and previous close, as a % of the previous close.
5. **14-day ratio:** the day's range % divided by the mean range % of the 14 days used before it. For early January 2005 the look-back uses late-2004 bars.

3. Results

How big is a normal day?

Daily range here is the day's high minus its low, divided by the previous day's close. Over 5,138 days the mean was 1.520% and the median 1.279%. The mean is higher than the median because a few very wide days pull it up: the widest day in the data, 17 Sep 2008, spanned 11.710% (US\$91.10).

Spread of daily ranges, XAUUSD, 5,138 days, 3 Jan 2005 to 31 Dec 2024

Point in the spread	Daily range
10% of days below	0.701%
25% of days below	0.925%
Median day	1.279%
75% of days below	1.819%
90% of days below	2.570%
95% of days below	3.207%
99% of days below	5.321%

Days with a range of at least

Daily range	Days	Share of days
0.5% or more	5,036	98.0%
1% or more	3,566	69.4%
1.5% or more	1,966	38.3%
2% or more	1,036	20.2%
3% or more	317	6.2%
4% or more	122	2.4%
5% or more	63	1.2%

Read the first table as: on 90% of days the range was below 2.570%. The second table counts days with at least that range. The narrowest day was 2 Jan 2006 at 0.097%, a holiday session.

Average daily range by year

Daily range by year, XAUUSD

Year	Days	Mean	Median	90% of days below	Mean US\$	Median US\$	Average close	Widest day	Date
2005	251	1.172%	1.045%	1.868%	US\$5.27	US\$4.60	US\$444.01	3.277%	20 Dec 2005
2006	250	2.177%	1.929%	3.430%	US\$13.21	US\$11.75	US\$603.79	7.216%	13 Jun 2006
2007	257	1.554%	1.417%	2.485%	US\$10.96	US\$9.60	US\$696.01	4.810%	12 Nov 2007
2008	258	2.878%	2.464%	5.063%	US\$24.69	US\$21.40	US\$872.09	11.710%	17 Sep 2008
2009	257	1.914%	1.673%	3.177%	US\$18.49	US\$16.52	US\$973.03	7.169%	18 Mar 2009
2010	256	1.471%	1.386%	2.271%	US\$17.94	US\$16.37	US\$1,226.11	4.615%	4 Feb 2010
2011	256	1.836%	1.523%	3.237%	US\$29.70	US\$23.52	US\$1,573.10	7.952%	26 Sep 2011
2012	257	1.350%	1.215%	2.192%	US\$22.44	US\$20.02	US\$1,668.75	5.863%	29 Feb 2012
2013	258	1.817%	1.559%	2.951%	US\$25.20	US\$21.87	US\$1,409.60	10.691%	15 Apr 2013
2014	258	1.315%	1.136%	2.137%	US\$16.55	US\$14.30	US\$1,266.03	6.781%	1 Dec 2014
2015	258	1.359%	1.226%	2.171%	US\$15.78	US\$14.56	US\$1,159.34	5.588%	20 Jul 2015
2016	258	1.466%	1.267%	2.322%	US\$18.27	US\$15.90	US\$1,249.43	8.592%	24 Jun 2016
2017	257	0.989%	0.943%	1.514%	US\$12.42	US\$11.80	US\$1,258.46	2.044%	15 Mar 2017
2018	258	0.966%	0.879%	1.516%	US\$12.27	US\$11.21	US\$1,268.56	2.938%	11 Oct 2018
2019	258	1.097%	0.945%	1.909%	US\$15.45	US\$13.27	US\$1,393.58	3.650%	13 Aug 2019
2020	259	1.719%	1.384%	2.796%	US\$30.36	US\$24.94	US\$1,771.94	7.309%	16 Mar 2020
2021	258	1.316%	1.167%	2.077%	US\$23.68	US\$20.95	US\$1,798.97	4.662%	8 Jan 2021
2022	258	1.418%	1.273%	2.213%	US\$25.58	US\$22.98	US\$1,801.60	5.058%	24 Feb 2022
2023	257	1.218%	1.077%	1.830%	US\$23.69	US\$20.74	US\$1,942.97	6.017%	4 Dec 2023
2024	259	1.378%	1.242%	2.076%	US\$33.04	US\$30.63	US\$2,389.53	4.251%	7 Jun 2024

Mean and median of the daily range in each calendar year. "90% of days below" = the 90th percentile. US\$ values follow the gold price, so compare years with the % columns. Average close = mean daily close of the year.

Average daily range by month

Daily range by calendar month, XAUUSD, 2005 to 2024

Month	Days	Mean	Median	vs average	Days 2% or more
January	424	1.496%	1.334%	0.98x	18.9%
February	402	1.497%	1.259%	0.98x	19.4%
March	438	1.629%	1.367%	1.07x	25.1%
April	416	1.494%	1.264%	0.98x	19.0%
May	439	1.463%	1.284%	0.96x	20.3%
June	428	1.486%	1.264%	0.98x	17.3%
July	440	1.408%	1.238%	0.93x	17.5%
August	445	1.478%	1.249%	0.97x	18.9%
September	425	1.612%	1.297%	1.06x	22.1%
October	441	1.614%	1.311%	1.06x	20.6%
November	420	1.571%	1.277%	1.03x	21.0%
December	420	1.492%	1.252%	0.98x	21.9%

All 20 years together. "vs average" = mean range of the month divided by the mean of all days (1.520%). The spread between months (0.93 to 1.07 times) is small next to the spread between years.

How often a day beats its 14-day average range

Many EAs and traders size stops and targets on a recent average range, often the last 14 days (ADR14). We compared each day's range with the mean range of the 14 trading days before it.

Day's range vs the 14-day average range before it

Day's range	Days	Share of days	About one day in
0.5x or more	4,813	93.7%	–
1x or more	2,113	41.1%	–
1.5x or more	651	12.7%	1 in 8
2x or more	204	4.0%	1 in 25
2.5x or more	72	1.4%	1 in 71
3x or more	35	0.7%	1 in 147

Ratio = day's range divided by the mean range of the previous 14 days in the data. The median ratio was 0.909: a normal day is a little smaller than the recent average, because the average includes the wide days. The largest ratio was 6.78 on 15 Apr 2013: a range of 10.691% after a 14-day average of 1.576%.

The 14-day average itself moved a lot. Its lowest reading was 0.659% (20 Sep 2023) and its highest 5.734% (28 Oct 2008). On 80% of days it was between 0.957% and 2.230%.

Range and true range

Average true range (ATR) also counts a gap from the previous close. For gold daily bars the difference was small: mean true range 1.532% against a mean range of 1.520%, 1.008 times. The previous close was outside the day's high-low on 7.0% of days.

4. Discussion

What this means for an EA

- A stop or grid step set to one average day is hit often. 38.3% of days had a range of 1.5% or more, and the 14-day average range was reached or beaten on 41.1% of days.
- A fixed US\$ stop does not stay the same size. US\$5.27 was an average day in 2005; in 2024 it was US\$33.04. Set stops as a % of price or as a multiple of a recent range.
- Test the quiet years and the wide years. A setting tuned on 2018 (0.966% a day) meets days 2.98 times wider in a year like 2008.

5. Limitations

Limits

- **One data source.** Not checked against a second feed. Other brokers and futures data give slightly different highs and lows.
- **Broker day.** The daily bar follows the broker's server day, not a fixed UTC day. Note 10 uses a 22:00 to 22:00 UTC day built from hourly bars, so its day ranges differ a little.
- **Spread is not included.** Bar prices do not include the spread or any slippage.
- **The past only.** The data ends in 2024 for this note. The record day on 30 January 2026 is not in it. Every number here comes from our own script.

Appendix

Related notes

- The 20 largest single-day moves and how often a day closes 2%, 3% or 5% away: XAUUSD largest daily moves: 20 years of gold data.
- Which hours and sessions make the daily range: XAUUSD average range by hour and session (Asia, London, New York).
- The direction side of the same months, which months gold rose or fell from 2005 to 2024: Gold seasonality by month: 20 years of XAUUSD returns.

FAQ

What is the average daily range of gold (XAUUSD)?

From 3 Jan 2005 to 31 Dec 2024 the mean daily high-low range of XAUUSD was 1.520% of the previous close, or US\$19.78. The median day was 1.279% (US\$16.65). Half of all days fell between 0.925% and 1.819%.

How has gold's daily range changed over the years?

In US\$ it grew from a mean of US\$5.27 a day in 2005 to US\$33.04 in 2024, mostly because the gold price rose. As a % of price it moved between 0.966% in 2018 and 2.878% in 2008.

Which month has the widest gold daily range?

March, with a mean range of 1.629% (1.07 times the average day). July was the quietest at 1.408% (0.93 times). The gap between months is much smaller than the gap between years.

How often is a gold day twice its average range?

On 4.0% of days (204 of 5,138, about one day in 25) the range was at least 2 times the average range of the 14 days before. 3 times or more happened on 0.7% of days, about one in 147.

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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