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Do round numbers matter for gold? 20 years of XAUUSD at US\$100 and US\$50 levels

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Abstract

Do round prices such as US\$2,000 act as barriers for gold? Using 5,138 daily XAUUSD bars from 2005 to 2024, we test whether gold closes back on its side after touching a US\$100 level and compare the round grid with 80 placebo grids of the same spacing, using rank-based tests, a Holm correction and block bootstraps. On 232 first touches gold held 45.0% of the time against 49.2% for ordinary levels; the round grid ranked 72nd of 81 and no main test passed after correction. Results were similar for US\$50 levels. We find no robust evidence that round numbers act as barriers on daily data. A working-paper version has been submitted to SSRN.

Keywords: gold; XAUUSD; psychological barriers; round numbers; support and resistance; placebo test

JEL: G14; G41; Q02

Highlights

- **Round levels did not hold better.** Gold made 232 first touches of a US\$100 level. It closed back on its side 45.0% of the time. Other levels: 49.2%.
- **If anything, they held a little less.** Next day the share was 43.1% against 49.7% (6.6 points lower). Among the 81 grids that ranks 74 (rank p 0.198; 0.594 after the Holm correction for our 3 main tests). A month-block bootstrap puts the gap at -12.2 to -0.9 points (p 0.030); maybe a small shortfall the next day, but no wall.
- **Counting every touch, round levels were crossed most.** On all 962 touches gold closed back on its side 43.6% of the time, the lowest of all 81 level grids (rank p 0.025, but these touches overlap). Levels US\$1 to US\$2 from a round number did almost the same (45.7%).
- **No wall after 5 days.** Five closes later the share was 47.8% for round levels and 51.0% for others.
- **Early years have few touches.** Only 37 first touches were below US\$1,000 and 27 above US\$2,000.

1. Introduction

Do round numbers like US\$2,000 or US\$2,500 stop gold? We took 5,138 daily bars of XAUUSD from January 2005 to December 2024 and found every day that touched a US\$100 or US\$50 level. Then we asked a simple question: after the touch, did gold close back on the side it came from? To see if round numbers are special, we ran the same test on 80 grids of ordinary levels, shifted away from round numbers.

Update, 24 October 2026. We turned this note into a working paper (version 3, submitted to SSRN) and revised the method after review. The conclusion did not change. What changed:

- **Main test:** the round grid's rank among all 81 grids (rank p), not a binomial test against the pooled share. The binomial p-values are now descriptive only.
- **Multiple tests:** Holm correction over the 3 main tests, instead of the 0.017 Bonferroni level.
- **New checks:** a month and quarter block bootstrap of the gap, and 1, 5 and 10-day first-touch windows (see "Checks added in the working paper").

- **Small corrections:** next-day placebo share 49.7% (was 49.6%), 5-day rank 68 (was 69), +US\$37 grid shares, and 36 usable same-day touches below US\$1,000 (37 eligible).

Script, tables and data hash: data and code.

The test in plain words

A level is "touched" when it sits inside the day's high-low range. We note which side of the level the day opened on. If the close is back on that side, the level "held". If the close is on the other side, gold "crossed" it. We check the same day's close, the next day's close and the close 5 days later.

A level touched again and again on following days counts many times. So our main test uses only **first touches**: the level was not touched on any of the 5 days before. Gold made 232 first touches of a US\$100 level, out of 962 touches in all.

For a fair baseline we move the whole US\$100 grid by US\$1, US\$2, US\$3 and so on up to US\$99, skipping steps of US\$5 (so US\$25, US\$50 and US\$75 are not used). That gives 80 grids of ordinary levels with the same spacing, such as US\$1,337 or US\$2,463. If round numbers are special, the round grid should stand out from them.

2. Data and method

Method

1. **Data:** daily XAUUSD bars (open, high, low, close) 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 11 to 13. Window 3 Jan 2005 to 31 Dec 2024, 5,138 days, the same days as note 13. Two days after the November 2005 and 2006 Thanksgiving holes are left out.
2. **Levels:** round = every multiple of US\$100 (main) or US\$50 (check). Gold traded from US\$409.80 (9 Feb 2005) to US\$2,790.09 (31 Oct 2024), so it touched 23 different US\$100 levels, from US\$500 to US\$2,700.
3. **Touch and hold:** touch = low at or below the level and high at or above it. Side = the day's open above or below the level (2 touches with the open exactly on the level are left out). Held = close strictly on the open's side; a close exactly on the level is left out. First touch = level not touched on the 5 bars before.
4. **Baseline:** the same test on 80 grids shifted by US\$1 to US\$99 (not multiples of US\$5). Every rule is applied the same way to all 81 grids.
5. **Tests (revised 24 Oct 2026):** main statistic = rank of the round grid among the 81 grids; two-sided rank $p = 2 \times$ the smaller tail count / 81, ties counted as extreme. The grids share one price path, so this p is conservative. Main family = US\$100 levels, first touches, 3 horizons, with a Holm correction. Second check: month and quarter block bootstrap of the round-minus-other gap (2,000 draws, seed 20261024). Exact binomial tests against the pooled share are descriptive only. All touches, US\$50 levels, other windows, price eras and touch counts are exploratory.

3. Results

Did round levels hold?

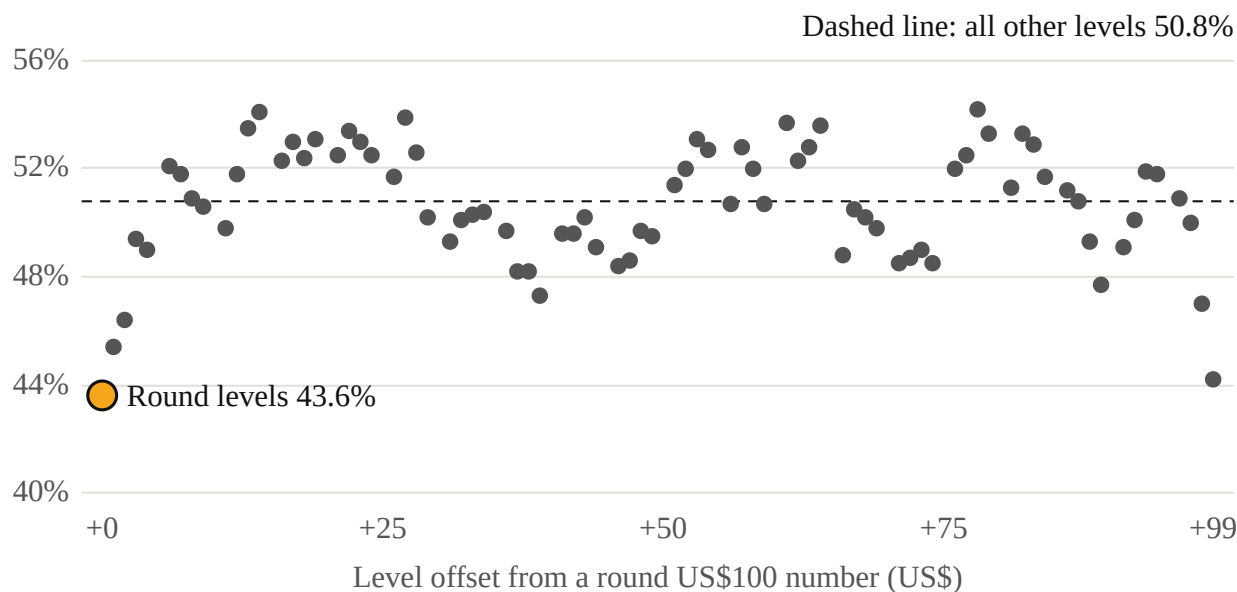
First touches of US\$100 levels: share that held, 2005 to 2024

Held at	Touches used	Round level	Other levels	+US\$37 levels	Rank p	Rank (1 = most held)
Same day's close	231	45.0%	49.2%	48.7%	0.247	72 of 81
Next day's close	232	43.1%	49.7%	45.5%	0.198	74 of 81
Close 5 days later	232	47.8%	51.0%	50.4%	0.346	68 of 81

All touches of US\$100 levels: share that held

Held at	Touches used	Round level	Other levels	+US\$37 levels	Rank p	Rank (1 = most held)
Same day's close	958	43.6%	50.8%	48.2%	0.025	81 of 81
Next day's close	960	46.9%	50.5%	47.8%	0.099	78 of 81
Close 5 days later	958	49.4%	50.2%	49.3%	0.691	54 of 81

Held = the close was on the same side of the level as the day's open. Round level = every multiple of US\$100. Other levels = 80 shifted grids pooled. +US\$37 levels = one shifted grid shown on its own. Rank = place of the round grid among all 81 grids, 1 = held most often. Rank p = two-sided rank-based p-value ($2 \times \text{the smaller tail count} / 81$, round grid included). Touches used = touches where the open and that close were not exactly on the level. All touches overlap on following days, so read that table with care. Source: our calculation, file tests.csv on the data page.



Share of touches where gold closed back on the side it opened on, all touches, XAUUSD 2005 to 2024. Each dot is one grid of levels US\$100 apart, shifted by the US\$ amount on the axis (offsets that are multiples of US\$5 left out, except 0). Gold dot = round US\$100 levels. Source: our calculation, file round_offsets.csv.

The round grid is at the bottom when every touch is counted, and the levels just next to it are low too. So if there is an effect, it is a zone around round numbers, not the exact price. And it does not survive on first touches: there the round grid ranked 72 of 81 (rank p 0.247), and no main test passes after the Holm correction.

Was gold touched less at round numbers?

Some studies say prices tend to stay away from round numbers. We counted touches. Gold touched a US\$100 level 962 times. The 80 shifted grids were touched 1,020.6 times on average (from 929 to 1,195). The round grid ranked 16 of 81 from fewest touches, so nothing unusual.

At US\$50 levels the round grid had the fewest touches of all 41 grids: 1,872 against 2,041.2 on average (from 1,901 to 2,156), rank p 0.049, the smallest possible with 41 grids. It is one of several checks, so we treat it as weak.

By price era

First touches of US\$100 levels by price era

Price of level	First touches	Same day: round	Other	Gap (pts)	Next day: round	Other	Gap (pts)
Under US\$1,000	37	55.6%	48.3%	+7.2	35.1%	47.5%	-12.4
US\$1,000-1,499	81	42.0%	50.0%	-8.0	43.2%	51.6%	-8.4
US\$1,500-1,999	87	46.0%	49.7%	-3.7	43.7%	48.5%	-4.9
US\$2,000 and up (few)	27	37.0%	46.2%	-9.1	51.9%	50.9%	+1.0

First touches of US\$100 levels, split by the price of the level. "Few" = fewer than 30 first touches; do not read much into that row. Gap = round minus other levels in the same price range, in percentage points. Descriptive only: small samples, and no test across eras. Below US\$1,000, 36 of the 37 first touches have a usable same-day close. Source: our calculation.

No price era shows round levels holding clearly better. Below US\$1,000 the same-day share was higher (55.6% against 48.3%), but on only 36 usable first touches, and the next-day share was lower (35.1%). Above US\$2,000 there were only 27 first touches, because gold first traded at US\$2,000 on 4 Aug 2020, so that row is thin.

US\$50 levels as a check

First touches of US\$50 levels: share that held

Held at	Touches used	Round level	Other levels	+US\$13 levels	Rank p	Rank (1 = most held)
Same day's close	453	44.6%	49.2%	52.4%	0.146	39 of 41
Next day's close	454	43.6%	49.7%	50.6%	0.098	40 of 41
Close 5 days later	454	47.6%	51.0%	53.9%	0.098	40 of 41

Same test on every multiple of US\$50 (round) against grids shifted by US\$1 to US\$49, skipping steps of US\$5. Rank p among 41 grids; the smallest possible is 0.049. Source: our calculation, file tests.csv on the data page.

US\$50 levels look the same as US\$100 levels: a little below other levels, but not unusual among the 41 grids (rank p 0.098 to 0.146). This is a check, not a main test.

Checks added in the working paper

Gap between round and other levels, first touches of US\$100 levels, block bootstrap

Held at	Gap (pts)	Month blocks: 95% range	p	Quarter blocks: 95% range	p
Same day's close	-4.2	-10.3 to 2.0	0.187	-10.1 to 1.7	0.159
Next day's close	-6.6	-12.2 to -0.9	0.030	-12.7 to -1.2	0.021
Close 5 days later	-3.2	-8.8 to 2.4	0.266	-9.0 to 2.1	0.225

Gap = round minus the pooled 80 shifted grids, in percentage points. We resample the 240 months (or 80 quarters) of the sample 2,000 times, keeping all grids together, and recompute the gap. Source: file boot.csv on the data page.

First-touch window: how many quiet days before a touch counts as first

Quiet days	Same day: round	Other	Rank p	Next day: round	Other	Rank p
1 day (452 touches)	42.7%	49.7%	0.025	44.9%	50.1%	0.025
5 days (main, 231)	45.0%	49.2%	0.247	43.1%	49.7%	0.198
10 days (174)	47.1%	49.2%	0.691	45.1%	49.2%	0.346

Same-day touch counts shown. Source: file lookback.csv on the data page.

The bootstrap finds the next-day shortfall at round levels hard to explain by chance (p 0.030 and 0.021; 0.090 and 0.063 after the Holm correction), while the rank test finds the round grid within the normal range of shifted grids. A short 1-day window, which keeps more repeat touches, shows round levels holding less (rank p 0.025); a 10-day window narrows the gap. In no version did round levels hold more often than other levels.

4. Discussion

What this means

- We found no sign that round numbers act as support or resistance for gold on daily bars. On first touches, round levels held about as often as any other price, or a little less.
- Do not give a round number extra weight as a wall. For stop and target size, the daily range by year and month (note 11) tells you more than the last two digits of the price.
- We found nothing here to support a rule that trades a bounce off a round number. Spread, swap and slippage would also come off any small gap.

5. Limitations

Limits

- **Daily bars only.** We do not know the order of moves inside a day, or how many times a level was crossed during the day. An hourly test was not run.
- **One data source.** A broker feed, not checked against a second feed. Other feeds have slightly different highs and lows, which changes some touches.
- **Price only.** No spread, swap or slippage. We did not test a trading rule.
- **Few early touches.** Below US\$1,000 and above US\$2,000 the counts are small. Every number here comes from our own script. The data ends in 2024 for this note.

Appendix

Related notes

- Which months gold rose or fell: Gold seasonality by month: 20 years of XAUUSD returns.
- Which weekdays gold rose or fell: Best day of the week for gold: 20 years of XAUUSD weekday returns.
- How many days in a row gold rose or fell: Gold up or down days in a row: 20 years of XAUUSD streaks.

FAQ

Do round numbers act as support or resistance for gold?

Not in this test. From 2005 to 2024 gold made 232 first touches of a US\$100 level. It closed back on the side it came from 45.0% of the time, against 49.2% for levels shifted away from round numbers. Round levels held a little less often, not more, and the round grid ranked 72 of 81 grids (rank p 0.247), within the normal range.

Does gold break through round numbers more often?

Slightly, when every touch is counted. On all 962 touches of a US\$100 level, gold closed back on its side only 43.6% of the time, against 50.8% for other levels, the lowest of all 81 level grids we tried. Levels US\$1 to US\$2 away from a round number did almost the same (45.7%), and on first touches the gap is too small to rule out chance.

Are US\$50 levels different from US\$100 levels?

No. On first touches of a US\$50 level gold closed back on its side 44.6% of the time, against 49.2% for other levels (rank p 0.146 among 41 grids). The pattern is the same as at US\$100 levels.

Should an EA place stops just beyond round numbers?

This data gives no reason to treat a round number as a stronger wall than any other price. Over 5 days, first touches of US\$100 levels held 47.8% of the time, against 51.0% for other levels.

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.
- Working paper: Huyen X. Vu (2026), Quantex Research, "Do Round Numbers Predict Price Reversals in Gold? Evidence from Daily XAUUSD Prices, 2005–2024", version 3, 24 October 2026, submitted to SSRN.
- Replication files (script, tables, data hash): data and code for this note.
- Earlier study of round-number barriers in gold (London fix, 1975 to 2015): Lucey and O'Connor (2016), "Mind the gap: psychological barriers in gold and silver prices", Finance Research Letters, vol. 17, pp. 135–140.
- Earlier evidence of psychological barriers in daily and intraday gold prices: Aggarwal and Lucey (2007), "Psychological barriers in gold prices?", Review of Financial Economics, vol. 16(2), pp. 217–230.

Declarations

- **Author:** Huyen X. Vu, Quantex Research, AlgoTrade Pte. Ltd., Singapore (ORCID 0000-0002-2209-842X).
- **Data availability:** Public dataset, analysis script and result tables: data and code.
- **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.
- **Conflict of interest:** The author is the founder of AlgoTrade Pte. Ltd., which develops and runs systematic trading models.
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