

The Failure Rate of a "Fakeout" Is Set by the Definition [F015]

Counting the same breakouts again with twenty different rulers moves the failure rate from **21.5038% to 91.6747%** — the per-instrument span is **66.6121 to 67.4601 points**, the same in all four series — and the gap against breakouts on a synthetic random walk has a median of **−1.2751 points**

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Abstract

This paper asks what sets the "seventy percent" in "seventy percent of breakouts are fakeouts" — the answer is the definition of failure. It claims neither a new mathematical theorem nor a new law.

First, applying twenty definitions of "failure" to the same breakouts (five choices of how soon it came back times four of how far), the failure rate moves from **21.5038% to 91.6747%**, with a median of **70.8895%** (Section 3).

Second, and this is the core of the paper, **the per-instrument span is 67.3477, 67.1632, 67.4601 and 66.6121 points — nearly the same in all four series.** ⚠️ **What moves is not the market but the ruler** (Section 3).

Third, extending "how soon" from 3 bars to 48 raises the median failure rate from **47.6242% to 84.4440%**. Deepening "how far" from the level itself to 1.00 ATR lowers it from **80.2616% to 49.3404%**. **Any number can be produced, in either direction** (Section 3).

Fourth, the directional information of the same breakouts has a median of **+0.7580 pips**, against a median spread of **0.7500 pips**. ⚠️ **The failure rate moves 67 points across twenty definitions and this value stays one number. The definition of failure concerns the exit and changes nothing about the entry's direction** (Section 4).

Fifth, ⚠ selecting only the breakouts that did not fail improves the directional information by a median of **+48.6814 pips**. **But that selects after looking ahead.** Whether a breakout failed is not known at the time (Section 5).

Sixth, repeating the measurement on synthetic series built from independent normal increments down to the movement inside each bar, the median difference in failure rate is **−1.2751 points**, with a median absolute value of **2.1631 points**. **A synthetic random walk has no real breakouts and no fakeouts, and gives the same rates anyway** (Section 6).

Scope of this paper (scope note): No new mathematical theorem and no new law is claimed — the definition of a breakout, the true range and random walks are all known. **No particular product or proponent is discussed** — no real course, author, or vendor is the subject here, and none is named. What is treated is the public turn of phrase itself. **Trading is not discussed** — what is measured is failure rates and directional information, not trading performance including commissions, fills and money management. **The scope is intraday and a small number of instruments** — four series, three years, one-hour bars. Monthly time-series momentum (dozens of markets, holding one to twelve months) is documented in the literature, and this paper does not contradict it. **One definition of a breakout is fixed** — a close beyond the high or low of the last 20 bars. A wick beyond the level, or another number of bars, is not treated (Section 8). **"Fakeout" is defined in two dimensions only** — how soon and how far. Definitions that add volume or shape are not treated. **The overlap is not removed** — the horizon is 24 bars and there are 2 to 3 observations a day (Sections 4 and 8). **No forecast is claimed. Relation to earlier papers:** this series always reports, alongside a rate, what that rate would be by chance. F012 showed that the win rate moves a great deal with the placement of the barriers while the expectation does not — this paper applies the same shape to the word "fakeout". What is added here is **opening the definition of failure into two dimensions and recounting twenty ways, showing that the directional information of the same breakouts does not depend on the definition, and placing the failure rate of breakouts on a synthetic random walk alongside.**

1. Notation and the question

There is a way of speaking that says "seventy percent of breakouts are fakeouts" and "a real breakout does not come back".

Statement	What it fixes	What it leaves open
It broke out	which level, and how it was crossed	—
It was a fakeout	—	how soon, and how far back, counts as failure
What this paper asks	once those two are fixed, how does the seventy move	

Observation 1.1: ⚠️ "a failure rate of 70%" says nothing on its own, because the definition of failure is not written down.

Observation 1.2: fixing failure takes at least two things: **how soon** it came back, and **how far** back it came.

Observation 1.3: the question settles by opening those two into a plane. Five deadlines times four depths gives twenty recounts. **If the rate moves a great deal, the failure rate is a restatement of the definition.**

Observation 1.4: ⚠️ and the directional information of the same breakouts is measured too. The definition of failure concerns **the exit**, not the entry's direction. **If the failure rate moves while the directional information does not, only the definition moved.**

Question: what sets the seventy in "seventy percent of breakouts are fakeouts"?

2. Writing the quantity and the design in advance

Design (declared before running and unchanged at run time)

Item	Decision
Lattice	one-hour bars, mid price, completed bars only
Breakout	a close beyond the high (or low) of the last 20 bars. ★ The bar itself is not included in that high or low
Failure (how soon)	within 3, 6, 12, 24 or 48 bars
Failure (how far)	back by 0.00, 0.25, 0.50 or 1.00 ATR from the level
Directional information	a signal on the breakout bar and the move over the next 24 bars (with the break, in pips)
Baseline	synthetic series random down to the movement inside each bar (10 realisations)
Instruments	USDJPY, EURUSD, GBPUSD, XAUUSD
Period	2019–2024. Evaluation 2022–2024

Observation 2.1: ⚠️ **the high and low of the last 20 bars exclude the bar itself.** Including it would put the bar into the test of whether that bar broke out.

Observation 2.2: ⚠️ **the directional signal sits on the breakout bar.** Changing the definition of failure does not change it. **So against twenty failure rates there is only one directional measurement.**

Observation 2.3: ⚠️ **"how far" is measured in ATR.** Fixing it in pips would mean something different in each instrument.

The breakout counts are **2,088** for USDJPY (up **1,322**, down **766**), **2,039** for EURUSD (up **985**, down **1,054**), **2,069** for GBPUSD (up **1,015**, down **1,054**) and **1,798** for XAUUSD (up **1,005**, down **793**).

3. The failure rate moves a great deal with the definition — this is the separator

Calculation 3.1 Failure rate recounted twenty ways (USDJPY, evaluation period, %)

How soon ¥ How far	0.00 ATR	0.25 ATR	0.50 ATR	1.00 ATR
3 bars	67.1456	52.8257	40.5651	21.5038
6 bars	73.8860	63.2487	51.7968	33.4451
12 bars	79.8178	72.3394	63.7584	48.8015
24 bars	85.1248	79.7505	73.5605	61.5163
48 bars	88.8515	85.1514	80.2979	71.6002

Calculation 3.2 Span by instrument

Instrument	Minimum	Maximum	Span (points)
USDJPY	21.5038%	88.8515%	67.3477
EURUSD	23.7862%	90.9493%	67.1632
GBPUSD	24.2146%	91.6747%	67.4601
XAUUSD	22.9143%	89.5265%	66.6121

Calculation 3.3 How each axis acts (median of four series, %)

Axis	Value	Median failure rate
How soon	3 bars	47.6242
How soon	6 bars	58.7147
How soon	12 bars	68.3801
How soon	24 bars	78.4312
How soon	48 bars	84.4440
How far	0.00 ATR	80.2616
How far	0.25 ATR	72.4909
How far	0.50 ATR	64.0928
How far	1.00 ATR	49.3404

Observation 3.4: the failure rate moves from 21.5038% to 91.6747%, with an overall median of 70.8895%. ⚠️ "Seventy percent are fakeouts" does come out. So do "only twenty percent are" and "ninety percent are".

Observation 3.5: ★ the per-instrument span is 66.6121 to 67.4601 points — nearly identical across the four. ⚠️ What moves is not the market but the ruler. A property of the market could differ from instrument to instrument.

Observation 3.6: extending the deadline raises the failure rate monotonically (47.6242% to 84.4440%).
Wait long enough and price eventually comes back.

Observation 3.7: deepening the threshold lowers it monotonically (80.2616% to 49.3404%). Demand a deep retracement and failures become rarer.

Observation 3.8: ⚠️ ★ the two axes act in opposite directions, so any number can be produced.

"Back to the level within 48 bars" gives **88.8515%**; "back by 1.00 ATR within 3 bars" gives **21.5038%**.

The same breakouts are being counted.

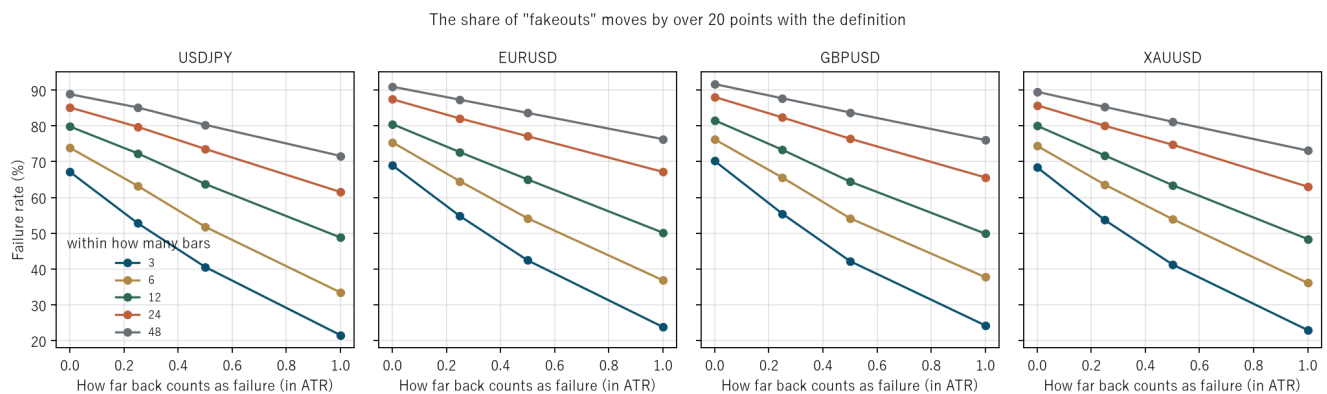


Figure 1: one panel per instrument, "how far" across, one line per "how soon". **The same shape appears in every instrument.**

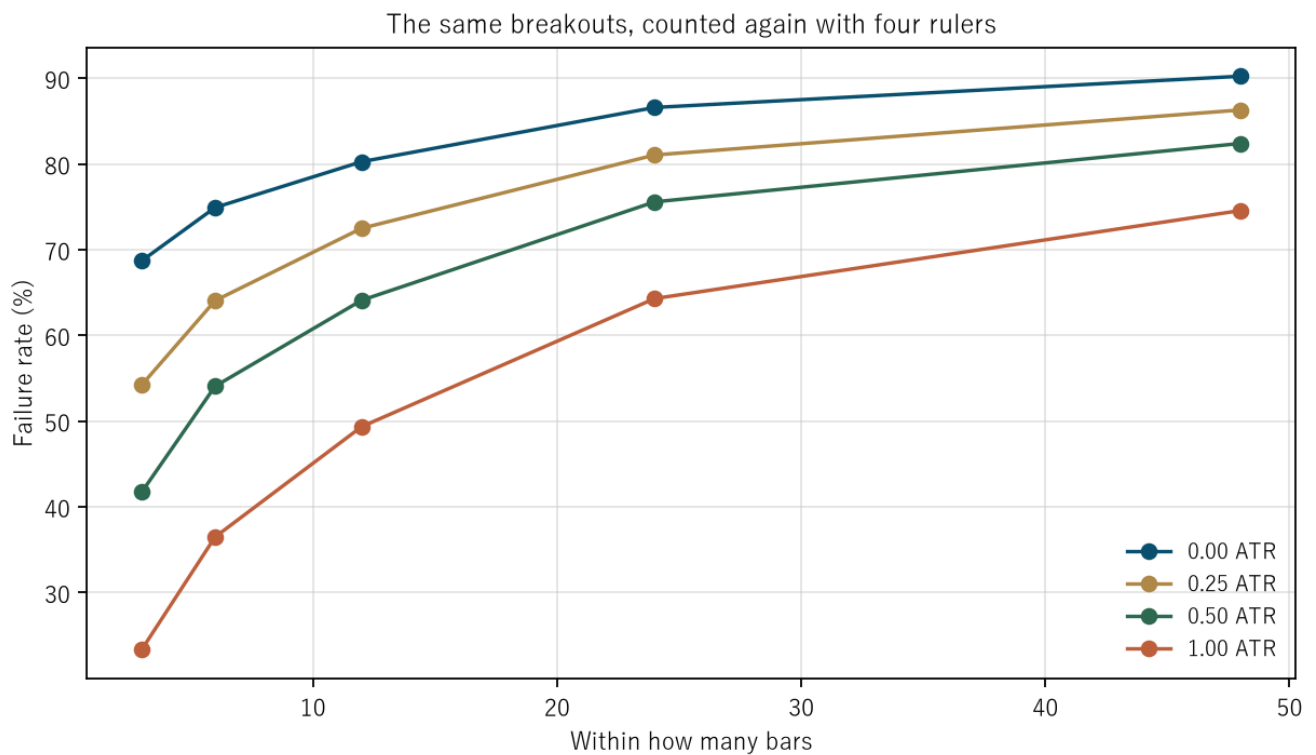


Figure 2: "how soon" across, one line per "how far". **The four lines lie far apart.**

4. The directional information of the same breakouts

Calculation 4.1 A signal on the breakout bar (evaluation period)

Instrument	Count	D (pips)	Dd (daily mean)	Daily t	Days	Per day	Spread	B
USDJPY	2,084	4.7369	− 6.1986	− 2.05	711	2.0	0.60	1
EURUSD	2,036	− 2.9264	− 7.4862	− 4.68	706	3.0	0.30	9
GBPUSD	2,069	0.3576	− 6.6898	− 3.10	713	3.0	0.90	1
XAUUSD	1,797	1.1583	− 20.5466	− 3.48	655	2.0	3.50	1

Observation 4.2: the median directional information is **+0.7580 pips** against a median spread of **0.7500 pips**. The same order.

Observation 4.3: ★ ⚠ the failure rate moved 67 points across twenty definitions, and this table is still one table. The definition of failure concerns the exit and **changes nothing about the entry's direction**.

Observation 4.4: ⚠ **D and Dd disagree in sign in all four series**. The overall mean scatters from **+4.7369** to **−2.9264** while the daily means are all negative, from **−6.1986** to **−20.5466**. **Days with many observations are making the overall mean**.

Observation 4.5: ⚠ the daily t reaches 2 in absolute value in **4 of 4** cells, where chance gives about **0.2**. ⚠ **But this must not be read as "breakouts lose"**. The horizon is 24 bars with 2 to 3 observations a day, so **the observations overlap**. As F010 and F014 showed, the overlap survives daily clustering.

5. Selecting only the breakouts that did not fail

Calculation 5.1 Selecting after looking ahead (evaluation period)

Instrument	How soon	How far	Failure rate	Remaining count	D of the remainder
USDJPY	3	0.00	67.1785%	684	32.2260
USDJPY	12	0.25	72.3129%	577	52.3307
USDJPY	24	0.50	73.5605%	551	76.7590
USDJPY	48	1.00	71.6002%	591	84.1438
EURUSD	3	0.00	69.0079%	631	6.3745
EURUSD	12	0.25	72.6424%	557	20.6346
EURUSD	24	0.50	77.1120%	466	42.0089
EURUSD	48	1.00	76.2912%	482	46.8619
GBPUSD	3	0.00	70.1788%	617	17.0118
GBPUSD	12	0.25	73.3204%	552	34.3677
GBPUSD	24	0.50	76.4137%	488	58.9293
GBPUSD	48	1.00	76.0407%	495	67.6130
XAUUSD	3	0.00	68.4474%	567	44.8329
XAUUSD	12	0.25	71.7307%	508	93.8529
XAUUSD	24	0.50	74.7357%	454	154.0638
XAUUSD	48	1.00	73.0919%	483	161.9278

Observation 5.2: the median difference is **+48.6814 pips**, ranging from **+9.3009** to **+160.5961**. **Very large.**

Observation 5.3: ⚠️ ★ **but this selects after looking ahead.** Whether a breakout "did not fail" **is not known at the time of the breakout.** Some definitions take 48 bars to settle.

Observation 5.4: ⚠️ **this number is not a trade.** It is reported not to show that "picking only the real breakouts wins" is true, but **to put a figure on what that "picking" is asking for.**

Observation 5.5: ★ the deeper the definition, the larger the difference (**+27.4891** to **+79.3766** for USDJPY). ⚠️ **Because a deeper definition looks further ahead.** The size of the difference is **a function of how much future was peeked at.**

6. The baseline — what share of a random walk's breakouts are fakeouts

Calculation 6.1 Synthetic series whose within-bar movement is also random (10 realisations, evaluation period)

Instrument	How soon	How far	Measured	Random walk	Difference (points)
USDJPY	3	0.00	67.1456%	66.8624%	+0.2832
USDJPY	12	0.25	72.3394%	75.2980%	− 2.9586
USDJPY	24	0.50	73.5605%	76.8001%	− 3.2396
USDJPY	48	1.00	71.6002%	76.6027%	− 5.0025
EURUSD	3	0.00	69.0044%	66.8646%	+2.1398
EURUSD	12	0.25	72.6424%	75.2829%	− 2.6404
EURUSD	24	0.50	77.1120%	76.7957%	+0.3163
EURUSD	48	1.00	76.2912%	76.6120%	− 0.3208
GBPUSD	3	0.00	70.1788%	66.8647%	+3.3141
GBPUSD	12	0.25	73.3204%	75.2992%	− 1.9788
GBPUSD	24	0.50	76.4137%	76.7962%	− 0.3824
GBPUSD	48	1.00	76.0407%	76.6121%	− 0.5715
XAUUSD	3	0.00	68.4093%	66.9991%	+1.4103
XAUUSD	12	0.25	71.7307%	75.3966%	− 3.6659
XAUUSD	24	0.50	74.7357%	76.9220%	− 2.1864
XAUUSD	48	1.00	73.0919%	76.6397%	− 3.5478

Observation 6.2: the median difference between measurement and random walk is **−1.2751 points**, with a median absolute value of **2.1631 points** and a range from **−5.0025** to **+3.3141**.

Observation 6.3: ⚠️ a synthetic random walk has no support, no resistance, nobody positioning and no pool of stop orders. **Between 66.8624% and 76.9220% of its breakouts are "fakeouts" anyway.**

Observation 6.4: ★ so the observation "seventy percent of breakouts are fakeouts" **says nothing about the market.** ⚠️ What it says is **only that price goes back and forth.**

Observation 6.5: ⚠️ the measurement is slightly lower (median difference **−1.2751 points**). That reads as fewer fakeouts than a random walk. ⚠️ **But inside a scatter with a median absolute value of 2.1631 points, this paper does not claim it.**

7. Splitting by session

Design: five **non-overlapping** bins in Coordinated Universal Time. The signal is the breakout of Section 4.

Calculation 7.1 Directional information in each of the five bins (evaluation period)

Instrument	Tokyo 0–7	London 7–12	Overlap 12–16	NY late 16–21	Night 21–24
USDJPY	4.94 (t − 0.64)	4.40 (t 0.68)	3.81 (t − 1.34)	3.52 (t − 0.50)	12.51 (t 1.61)
EURUSD	− 3.25 (t − 0.66)	− 0.89 (t − 0.98)	− 3.93 (t − 3.05)	− 3.48 (t − 0.89)	− 4.30 (t − 0.76)
GBPUSD	1.80 (t − 0.61)	2.36 (t − 0.56)	− 2.00 (t − 2.02)	− 2.08 (t − 1.05)	8.04 (t 0.51)
XAUUSD	2.90 (t − 0.80)	6.07 (t 0.01)	5.44 (t − 1.32)	− 2.97 (t − 0.79)	− 59.68 (t − 1.88)

Observation 7.2: the daily t reaches 2 in absolute value in **2 of 20** cells, against about **0.9** by chance — somewhat more.

Observation 7.3: ⚠ both are in Overlap 12–16 and **both are negative**. ⚠ **This paper does not claim them.** As in Section 4, **the observations overlap, so the daily t is inflated too.**

Observation 7.4: ⚠ XAUUSD in the night bin shows a large **−59.68 pips**, but its t is **−1.88**. **The size comes from the size of gold's moves.**

8. Limitations

1. ★ **One definition of a breakout is fixed**, a close beyond the high or low of the last 20 bars. A wick beyond the level, another number of bars, or a volume condition are not treated. ⚠ The conclusion that moving the definition moves the failure rate only strengthens as definitions are added.
 2. **"Fakeout" is defined in two dimensions only**, how soon and how far. Definitions adding shape or volume are not treated.
 3. ★ **The overlap is not removed**. The horizon is 24 bars with 2 to 3 observations a day. **The daily t in Sections 4 and 7 is inflated.** ⚠ **This paper does not say that breakouts lose.**
 4. **Section 5 looks ahead**. Whether a breakout failed is known only later. **It measures an upper bound.**
 5. **The ATR period is fixed at 14**. Another period changes the actual width of "how far". ⚠ The same period is used for the measurement and the random walk, so the comparison stands.
 6. **The synthetic baseline uses independent normal increments**. Volatility clustering is not included.
 7. **Four instruments over three years**. Nothing is said about other markets or other periods.
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Conclusion

"Seventy percent of breakouts are fakeouts" is right. The overall median is **70.8895%**.

But applying twenty definitions to the same breakouts moves the failure rate from **21.5038%** to **91.6747%**. **"Only twenty percent are fakeouts" and "ninety percent are" come out of the same data.** Extending the deadline raises it; deepening the threshold lowers it. The two axes act in opposite directions, so **any number can be produced.**

And the per-instrument span is **66.6121** to **67.4601 points**, nearly the same in all four. **What moves is not the market but the ruler.**

The directional information of the same breakouts has a median of **+0.7580 pips** against a median spread of **0.7500 pips**, and against twenty definitions there is **only one such number.** The definition of failure concerns the exit and changes nothing about the entry's direction.

The gap against breakouts on a synthetic random walk has a median of **-1.2751 points.** **In a series with no support and no resistance, about seventy percent are fakeouts too.**

What "seventy percent are fakeouts" says is only that price goes back and forth.

Data and reproduction

Data	Currency ticks from Dukascopy (agreement to the millisecond, bid and ask, verified from 2019 onward). Gold from Dukascopy
Period	2019–2024 (six years). Evaluation 2022–2024
Instruments	USDJPY, EURUSD, GBPUSD, XAUUSD
Bars	One-hour, mid price, closing value of completed bars only. Bars with no ticks are not created
Breakout	A close beyond the high or low of the last 20 bars, that bar excluded
Verification	<code>検算/F015.py</code> (with <code>--zu</code> it also writes the figures). Every number in the text is taken from <code>検算/F015_output.txt</code>
Figures	<code>図/F015_zu1</code> , <code>図/F015_zu2</code> (png, svg, English versions)
Random seeds	Fixed at 0–9. Re-running gives the same values
Audit of the foundation	<code>_ツール/audit_bars.py</code> (look-ahead in the bars, daylight saving, the day boundary). The record is <code>_土台の検査.txt</code>

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