Buying Back in Thirds Wins From Today

F011-R: F011's Sell Ladder Against Three of F010's Rivals, for a Retiree Who Spends

Scale Invariant Capital Research | 2026-11-18 | Research report F011-R (registered addendum to F011) | v1.0

Research on simulated worlds. Not financial advice; no result here is a guarantee.

Plan: pre-registration `research/F011R-preregistration.md`, committed 2026-11-10 before any F011-R code. Builds on F011 (`report/spend_floor_growth.md`, v1.2; published as Paper 23, Retiring on Bitcoin Without a Reflecting Floor) and F010 (`report/ladder_rebuy.md`, published as Paper 22). Everything not stated here is as in F011: worlds, paths, seeds, spending rule B1, costs, cash, the ruin rule, metrics and the bootstrap. Every run uses the corrected (circular-block) shock draw described in F011 Section 13; the deviation this required is logged in the pre-registration (2026-11-18) and in Section 9.

Summary

F011 asked what a Bitcoin retiree should sell to pay for spending, and its registered rule picked **L2-R1**, F010's ladder: sell half the Bitcoin at 2× the power-law trend and half again at each higher rung, spend that cash first, and buy everything back when the price returns to the trend. That answer was among F011's eight registered layers. F010 had found three other rules close to L2-R1, or ahead of it where it is weak, and F011 did not run them. F011-R runs them under F011's spending rule, in F011's twelve worlds, through F011's decision rule, fixed in advance:

- **L2-R3**, the same ladder, buying back in thirds at 1.0×, 0.75× and 0.5× trend;
- **L2-RP**, the same ladder, buying back each sale at half its sale price or a backstop near 0.74× trend;
- **TA 1**, trend-anchored Kelly: a Bitcoin and cash mix reset at each month-end.

The answer. With F010's rivals included, the registered rule recommends **L2-R3**, from today's price (0.49× trend), at the spending where a holder is safe (c*). It is the winner and the only co-winner: score S 0.806 against L2-R1's 0.773, with a 90% bootstrap interval for S(L2-R1) - S(L2-R3) of -0.040 to -0.027. All four rules pass every risk gate in every core world. L2-R3 also adds the most safe spending (D +5.6 coverage points against L2-R1's +4.8), and it still leads L2-R1 when the ladders trade only at month-end (0.566 against 0.500). No layer scores above it. With the ruin floor at 0.1% or 10% of the start, the recommendation does not change.

Where it holds and where it does not.

- **From the trend and from a peak, the answer is L2-R1.** From the trend, L2-R1 is the only co-winner (1.158 against L2-R3's 1.140; interval for the difference +0.005 to +0.032). From 2.5× trend the two are co-winners (1.664 and 1.656), and L2-R1 is recommended because it is simpler.
- **The lead comes from the cycle worlds.** L2-R3 scores 0.508 against 0.435 there, mostly from the euphoria-then-floor world (EUPH_FLOOR: 3.27× a holder's Bitcoin against 2.30×) and WILD.

In the statistical worlds the two are level (1.105 against 1.111), and L2-R1 leads that family on its own. Leave out BROKEN, where the trend breaks, and L2-R1 comes first again (0.754 against 0.749).

- **Waiting for 0.75× and 0.5× costs where the price stops falling at the trend.** In DAMPED and FADING, L2-R3 keeps 1.40× and 2.99× a holder's Bitcoin against L2-R1's 1.64× and 3.41×, and at year 30 its median Bitcoin-equivalent is about half of L2-R1's.

So the two buy-back rules are close, and which one comes first depends on the start and on which worlds you believe. The interval covers path sampling only.

The other two rivals. L2-RP is the robust one, as F010 found: where multiples drift without reverting (NO_REVERSION) it keeps 0.97× a holder's Bitcoin against 0.68× to 0.74× for the other ladders and TA 1. Where they ratchet up (UPSHIFT) it holds a median 0.54 Bitcoin-equivalent at year 30 against a holder's 0.19 and L2-R1's 0.04. It scores 0.700. TA 1 scores 0.648. It beats all three ladders when they trade only at month-end, as predicted, but not when they fill on daily closes.

Predictions. Four of five registered predictions are supported. The first, that L2-R1 would score highest, is not.

Secondary readings (not part of the decision): the recommendation changes in three of the four. With intramonth swings × 0.75, L2-R3 stays the recommendation (S 0.693 against L2-R1's 0.642). With swings × 1.25 it changes to **L2-R1**, the only co-winner (0.943 against 0.934). At lower spending it changes too: at half of c* the two are co-winners (L2-R3 0.669, L2-R1 0.668) and L2-R1 is recommended as the simpler; at 5% coverage L2-R1 is the only co-winner (0.633 against 0.622). So L2-R3's lead holds at F011's primary settings and with calmer intramonth swings, not with wider swings or at lower spending.

What changes in F011's report. As the pre-registration fixed in advance, F011's summary now states that, with F010's rivals included, the registered rule recommends L2-R3 from today, and L2-R1 from the trend and from a peak. F011's own result stays, labelled as the answer among its eight layers.

1. Question and Field

> Would any of three F010 rules that came close to L2-R1, or beat it where it is weak, also beat it for a retiree who spends from the stack?

Code	In one line
HOLD	Hold Bitcoin; pay spending by selling Bitcoin
L2-R1	Sell half at 2×, 3×, 4.5×… trend; buy everything back at 1.0× trend (F011's recommendation)
L2-R3	The same rungs; buy back in thirds at 1.0×, 0.75× and 0.5× trend
L2-RP	The same rungs; buy back each sale at max(half its sale price, P*), with P* near 0.74× trend
TA 1	Trend-anchored Kelly: Bitcoin weight clip((g + σ²/2 - r)/σ², 0, 1), reset at each month-end

Simplicity order (fixed in advance; it breaks ties and picks among co-winners): HOLD, L2-R1, L2-R3, L2-RP, TA 1.

Why these three (F010, no spending): L2-R3 scored closest to L2-R1 (0.469 against 0.493) and slightly above it with month-end fills; L2-RP kept 0.90× a holder's Bitcoin in NO_REVERSION against L2-R1's 0.56×; TA 1 scored above every ladder with month-end fills (F011-R pre-registration). In every layer, spending is paid from the ladder's cash pool first, then from Bitcoin; TA 1 pays from the mix and then rebalances.

2. Method

As F011 (Section 2 of its report), with the field above:

- **Spending:** B1, coverage c of the floor's dollar growth over the next 12 months, fixed at the start and indexed to US CPI paths. **c*** in each world is holding's SC99 (the highest coverage with at most 1% ruin over 30 years) from F011's corrected files: from today CALM_FLOOR 85%, CALM_MISS 100%, EUPH_FLOOR 90%, EUPH_MISS 110%, DECAY 80%, WILD 90%, UPSHIFT 120% (the grid top), BASE 50%, DAMPED 80%, FADING 55%, BROKEN 25%, NO_REVERSION 50% (holding is never safe there; left out of the scores).
- **Worlds:** six cycle worlds (CALM_FLOOR, CALM_MISS, EUPH_FLOOR, EUPH_MISS, DECAY, WILD) and the stress world UPSHIFT; four statistical worlds (BASE, DAMPED, FADING, BROKEN) and NO_REVERSION. 2,000 paths each, from today (2026-10-31, 0.489× trend); the five statistical worlds also from the trend and from 2.5× trend.
- **G:** the geometric-mean ratio of a layer's Bitcoin-equivalent to a holder's over years 10 to 14, with a ruin floor at 1% of the start. **S** = ½ S_cyc + ½ S_stat, the mean of log G over the scored worlds of each family. **D:** the mean gain in SC99, in coverage points.
- **Gates** in each of the nine core worlds: ruin at c* at most 1 point above holding's, SC99 at most one step below, G ≥ 0.95, 10th percentile ≥ 0.80.
- **Winner** is the admissible layer with the highest S. **Co-winners** are those whose 90% bootstrap interval for S − S_winner includes 0. The **recommendation** is the simplest co-winner with S ≥ 0 in both families, D ≥ −1.0, and, for a ladder, admissibility and S ≥ 0 with month-end fills.

Ladders fill on daily closes from F010's resampled intramonth library, which deepens simulated dips in the largest-move months (F011 Section 2.3); month-end-fill rows (ME:) are free of it. TA 1 trades only at month-ends.

3. Checks

All three registered checks passed before any registered run.

- **R-C1, regression.** The extended engine reproduces F011's committed results for HOLD, L2-R1, ME:L2-R1 and FK½ bit for bit: 22 of 22 tasks, both against the registered engine copy (`analysis/f011r_engine_registered.py`) and against F011's corrected files.
- **R-C2, link to F010.** With no spending, every ladder's G and 10th percentile match F010's corrected lump-sum results within 10^{-4} relative in all 12 worlds, and TA 1's within 0.2%.
- **R-C3, hand-computed cases.** 37 cases on synthetic paths pass, and so do F011's 182 existing cases (`analysis/f011/engine_checks_review.json`).

Results: `analysis/f011r_checks.json`.

4. The Answer, From Today

Table 1. The registered decision from today. S over the eleven scored worlds; admissibility over the nine core worlds. The ladders fill on daily closes and carry the intramonth label. Full tables: Appendix Tables R1 and R3 to R7.

Layer	Admissible	S	S cycle	S stat	D (points)	G: EUPH_FLOOR	G: WILD	G: BASE	G: DAMPED	G: FADING	G: BROKEN
HOLD	yes	0	0	0	0	1.00	1.00	1.00	1.00	1.00	1.00
L2-R1	yes	0.773	0.435	1.111	+4.8	2.30	2.44	4.48	1.64	3.41	3.41
L2-R3	**yes**	**0.806**	**0.508**	**1.105**	**+5.6**	**3.27**	**2.98**	**4.66**	**1.40**	**2.99**	**4.27**
L2-RP	yes	0.700	0.476	0.923	+5.6	2.85	2.88	3.46	1.44	2.69	3.00
TA 1	yes	0.648	0.393	0.902	+4.8	2.42	2.18	3.37	1.44	2.44	3.13

L2-R3 is the winner and the only co-winner. The 90% interval for S(L2-R1) - S(L2-R3) is -0.040 to -0.027, wholly below zero, so L2-R1 is not a co-winner. That is the case the pre-registration set out: "a rival is recommended only if it is the winner, the 90% interval for S_L2-R1 - S_rival lies wholly below zero, and the rival passes step 5." L2-R3 passes step 5:

- S ≥ 0 in both families (0.508 and 1.105), and D = +5.6 ≥ -1.0;
- with month-end fills it is admissible and scores 0.566, above ME:L2-R1's 0.500;
- with the ruin floor in G at 0.1% or 10% of the start, it is again the only co-winner and the recommendation.

Every rival is admissible. None of the four rules fails a gate in any core world (prediction R-P5). Every rule's ruin at c* is at or below holding's in every core world, and its SC99 at or above it (Appendix Tables R6 and R7). L2-R3 and L2-RP reach the grid top (120%) in EUPH_FLOOR, where L2-R1 and TA 1 stop at 110%. That one step is why their D (+5.6) is above L2-R1's (+4.8). With L2-R3 and L2-RP level on D, "most spending" goes to the simpler, L2-R3.

No layer scores above the recommendation, admissible or not.

4.1 Where the lead comes from

L2-R3 differs from L2-R1 only in where it buys back: a third of the cash at the trend, a third at 0.75× and a third at 0.5×, instead of all of it at the trend. That helps when the price falls well below the trend after a euphoria, and costs when it stops at the trend and climbs again, because the unfilled orders sit in cash.

- **Cycle worlds: L2-R3 0.508, L2-R1 0.435.** The gain is in EUPH_FLOOR (3.27× against 2.30×), where the post-euphoria crash runs to the floor at 0.42× trend and fills every third, and in WILD (2.98× against 2.44×). In UPSHIFT, where multiples ratchet up, L2-R3 does slightly worse (1.58× against 1.74×). In the three worlds with no euphoria (CALM_FLOOR, CALM_MISS, DECAY) no ladder sells, and all three keep exactly a holder's Bitcoin.
- **Statistical worlds: level (1.105 against 1.111).** L2-R3 gains in BROKEN (4.27× against 3.41×) and slightly in BASE (4.66× against 4.48×). It loses in DAMPED (1.40× against 1.64×) and FADING (2.99× against 3.41×), where swings below the trend are shallower and the deeper orders often wait for years.

World-model check (a reading, as F011 Table A6b; Appendix Table R2). L2-R3 comes first in 10 of the 11 leave-one-out scores, from 0.734 (without BASE) to 0.935 (without DAMPED). Without BROKEN, L2-R1 comes first (0.754 against 0.749). By family, L2-R3 leads the cycle family (0.508; L2-RP 0.476; L2-R1 0.435) and L2-R1 leads the statistical family (1.111; L2-R3 1.105). So the recommendation rests on the cycle worlds, on EUPH_FLOOR and WILD above all, and on BROKEN, a stress world in which the trend breaks. The bootstrap interval is narrow because it covers only path sampling; it says nothing about which of these worlds is right.

4.2 Month-end fills

With every ladder filling only at month-end closes, all three remain admissible, and L2-R3 still leads them: ME:L2-R3 0.566, ME:L2-R1 0.500, ME:L2-RP 0.477. TA 1, which trades only at month-ends, scores 0.648, above all three (prediction R-P2, supported). With daily fills, all three ladders score above it (L2-RP's 0.700 is the lowest). So on an equal month-end footing trend-anchored Kelly beats every ladder, as F010 found without spending. Its lead depends on the ladders not being able to act within the month, which is how F011 and F011-R treat a retiree who checks prices only at month-end.

5. From the Trend and From a Peak

The registered step 7 repeats the decision on the five statistical worlds from the trend and from 2.5× trend (Appendix Tables R9-TREND and R9-PEAK).

Table 2. S by start. From the trend and from a peak, S is over the four scored statistical worlds.

Start	L2-R1	L2-R3	L2-RP	TA 1	Co-winners	Recommendation
Today (0.49× trend; all 11 scored worlds)	0.773	**0.806**	0.700	0.648	L2-R3	**L2-R3**
Today, statistical family only	**1.111**	1.105	0.923	0.902	(reading)	
Trend	**1.158**	1.140	0.947	0.975	L2-R1	**L2-R1**
2.5× trend	**1.664**	1.656	1.409	1.228	L2-R1, L2-R3	**L2-R1** (simpler)

- **From the trend**, L2-R1 is the only co-winner: the interval for S(L2-R1) − S(L2-R3) is +0.005 to +0.032. Every layer is admissible, and every layer gains the same safe spending (D +3.75).
- **From 2.5× trend**, L2-R1 and L2-R3 cannot be told apart (interval −0.009 to +0.024). L2-R1 is recommended because it is simpler. L2-R3 is "most spending" (D +32.5 against +31.3). The recommended layer is admissible from a peak in every statistical core world.

From both other starts, as from today in the statistical family, L2-R3 gains in BASE and BROKEN and loses in DAMPED and FADING. With month-end fills from a peak, ME:L2-R3 scores above ME:L2-R1 (1.279 against 1.210); from the trend, too (0.750 against 0.701).

6. Stress Worlds and the 30-Year Reading

Table 3. Stress worlds at c*. Values below 0.80 in NO_REVERSION are the registered stress flags (Appendix Table R8).

World	L2-R1	L2-R3	L2-RP	TA 1
UPSHIFT (multiples ratchet up), G	1.74	1.58	1.59	1.41
UPSHIFT, median Bitcoin-equivalent at year 30 (holder 0.19)	0.04	0.05	**0.54**	0.01
BROKEN (trend breaks), G	3.41	**4.27**	3.00	3.13
NO_REVERSION (random walk, at 50%), G	0.68	0.74	**0.97**	0.72

- **NO_REVERSION:** every layer but L2-RP keeps less than 0.80× a holder's Bitcoin over years 10 to 14. L2-RP's buy-back follows the sale price, not the trend, so it buys back even when the trend has stopped meaning anything (prediction R-P3, supported).
- **UPSHIFT:** after selling into a rise that never reverts, the trend-anchored ladders and TA 1 sit in cash. At year 30 L2-R3 holds a median 0.05 Bitcoin-equivalent and L2-R1 0.04, against a holder's 0.19. L2-RP holds 0.54, and is at or above the holder on 85% of paths (R-P3, supported).
- **30 years, core worlds** (Appendix Table R12). L2-R3 ends ahead of L2-R1 where euphorias are followed by deep falls (EUPH_FLOOR 0.89 against 0.57 Bitcoin-equivalent; WILD 3.44 against 2.41; BASE 33.7 against 29.9) and behind where they are not (DAMPED 0.71 against 1.28; FADING 1.63 against 2.86). In DAMPED and FADING, 96% of its paths still end at or above a holder's.

7. Secondary Readings (Reported, Not Decided)

As registered, two readings re-run the decision with one setting changed. They are reported, not decided, and the month-end condition is not re-applied in either. Tables R10 and R11 give the scores.

Intramonth swings × 0.75 and × 1.25. L2-R3 and L2-RP were rerun with F011's shape-scale settings; L2-R1 comes from F011's own shape-scale runs, and TA 1 and HOLD, which trade only at month-ends, from the primary run. With calmer swings (× 0.75) L2-R3's lead widens: S 0.693 against L2-R1's 0.642, and L2-R3 is the only co-winner and the recommendation. With wider swings (× 1.25) the order flips: L2-R1 scores 0.943 against L2-R3's 0.934 and is the only co-winner, so **the recommendation changes to L2-R1**. L2-RP (0.602 and 0.825) stays third among the ladders in both. TA 1 (0.648) passes L2-R1 and L2-RP with calmer swings, but not L2-R3.

Lower spending. All five layers were rerun at half of c* in each world (BASE 25%) and at 5% in every world, with ruin, G and the 10th percentile at that level, and SC99 and D from the primary run. At half of c*, L2-R3 and L2-R1 score 0.669 and 0.668; both are co-winners, and **L2-R1 is recommended as the simpler**. At 5%, L2-R1 leads (0.633 against 0.622) and is the only co-winner. L2-RP (0.583, 0.543) and TA 1 (0.553, 0.521) stay behind at both levels. All five layers are admissible at both levels.

Together with Section 5, these readings say the same thing: L2-R1 and L2-R3 are close, and L2-R3 comes first only from today, at c*, with intramonth swings no wider than F011's primary library.

8. Predictions

#	Prediction	Result	Values
R-P1	L2-R1 has the highest S of the five from today	**not supported**	L2-R3 0.806 against L2-R1 0.773
R-P2	With month-end fills for all three ladders, TA 1's S is above all three	supported	TA 1 0.648; ME:L2-R3 0.566, ME:L2-R1 0.500, ME:L2-RP 0.477
R-P3	L2-RP's G above L2-R1's in NO_REVERSION, and its median at month 360 above L2-R1's in UPSHIFT	supported	0.97 against 0.68; 0.54 against 0.04
R-P4	L2-R3's G above L2-R1's in EUPH_FLOOR	supported	3.27 against 2.30
R-P5	L2-R3, L2-RP and TA 1 are all admissible	supported	no gate failed in any core world

R-P1 was informed by F010, where L2-R1 scored above L2-R3 without spending (0.493 against 0.469). Under spending at c*, L2-R3's gain in EUPH_FLOOR and BROKEN outweighs its loss in DAMPED and FADING.

9. What Was Known When, and Deviations

- **Registered** 2026-11-10, before any F011-R code. Everything in F011 and F010 had been seen, including the three rivals' F010 results without spending and their retiree withdrawal rates (pre-registration, "What has been seen").
- **2026-11-10, a breach, logged at once:** a 40-path smoke test on the old paths printed the mean Bitcoin-equivalent at month 360 in EUPH_FLOOR at 0% and 90% coverage, which put L2-R3 and TA 1 above L2-R1 there. Nothing in the rule, checks or predictions was changed after it.
- **2026-11-10:** R-C3's first run failed 9 TA 1 cases by at most 3×10^{-7} relative, because the hand values were in float64 and the registered weights are float32. The cases were corrected; no engine change.
- **2026-11-18, before any registered run:** F011 corrected the shock draw shared with F009 and F010 (F011 report v1.2, Section 13), which changed the statistical worlds' paths. As the rule defines c* as holding's SC99 from F011's committed files, c* was taken from the corrected files (from today: BASE 50%, DAMPED 80%, FADING 55%; the cycle worlds are unchanged). Half of c* in BASE became 25%. R-C1 and R-C2 were rerun on the corrected paths and passed. The outcome table's reference to L2-R1's S of 0.804 reads 0.773. Nothing else changed. No rival had been run on the corrected paths, or at c* on any paths, before the registered runs.

The registered runs used four workers instead of the planned three; every task is deterministic and seeded by world, so this changes no number.

10. Limitations

- **Primary settings only.** F011-R does not rerun F011's other sensitivities for the rivals: cash at 2.65%, CPI + 1 point, matched refit lines, reflection, history, the leverage arm, the spending rules B0 and V. Cash at 2.65% bears most on layers that hold cash for long, which includes L2-R3's deeper orders and TA 1.
- **The interval covers path sampling only.** Which rule leads depends on which worlds are believed, and on the start (Sections 4.1 and 5).
- **The intramonth library** deepens simulated dips in the largest-move months by 1.25 to 1.52 times history's (F010 Section 12), which helps buy orders fill. It does not favour L2-R3: with calmer swings (× 0.75) L2-R3's lead widens, and with wider ones (× 1.25) L2-R1 leads (Section 7). L2-R3's month-end variant, free of the library, also leads the other month-end ladders.
- **The lead is narrow.** The recommendation changes to L2-R1 from the trend and from a peak (Section 5), with intramonth swings × 1.25 and at lower spending (Section 7).
- **Worlds as F011.** The statistical worlds' swings are wider than history's, and BASE spends 16% of its months below the floor against 2.2% in 2012 to 2026 (F011 Section 14).
- **Four rules, not all of F010's.** TA ½, L1.5-R1 and F010's other rules were not run (pre-registration, "Not in the field").

11. What F011's Report Now Says

The pre-registration fixed the text for each outcome. For "a rival is recommended": F011's summary states that, with F010's rivals included, the registered rule recommends that rival, and F011's registered result stays, labelled as the answer among its eight layers. In every row, both reports' summaries also state any change of recommendation with the floor at 0.1% or 10% (none), from the trend or from a peak (L2-R1 from both), and name every layer with a higher S than the recommendation (none). F011's report v1.3 does this in its abstract, its key findings, Section 3, its limitations and its conclusion.

Data and Reproducibility

Code: `analysis/f011_mc.py` (layers L2-R3, L2-RP, TA1 and their month-end variants; modes `rivals` and `rivals_sens`), `analysis/f011r_checks.py`, `analysis/f011_review_checks/rivals_cases.py`, `analysis/f011r_decide.py`, `analysis/f011r_tables.py`. Data, paths and seeds as F011.

```
python3 -W ignore analysis/f011_checks_review.py           # R-C3 (and F011's cases): analysis/f011/engine_checks_review.json
python3 -W ignore analysis/f011r_checks.py                 # R-C1 and R-C2: analysis/f011r_checks.json
python3 -W ignore analysis/f011_mc.py 2000 4 rivals        # analysis/f011/rivals_{WORLD}_{START}_rivals.json and .npz
python3 -W ignore analysis/f011_mc.py 2000 4 rivals_sens   # analysis/f011/rivals_sens_{WORLD}_TODAY_{variant}.json and .npz
python3 -W ignore analysis/f011r_decide.py                 # analysis/f011r_results.json
```

```
python3 analysis/f011r_tables.py                    # analysis/f011r_tables.md (the appendix below)
```

Run from the repository root with `PYTHONPATH=analysis`. The registered runs took about 96 minutes (`rivals`) and about 2.5 hours (`rivals_sens`) on four workers.

Appendix: Tables

Table R1. Scores, admissibility and the bootstrap, from today (12 worlds)

Layer	Admissible	S	S_cyc	S_stat	D	D (all worlds)	S - S_winner, 90%	S_L2-R1 - S_layer, 90%	Admissibility failures
HOLD	yes	0.000	0.000	0.000	0.00	0.00	-0.819 to -0.795		
L2-R1	yes	0.773	0.435	1.111	4.79	4.00	-0.040 to -0.027		
L2-R3	yes	0.806	0.508	1.105	5.62	4.71	0.000 to 0.000	-0.040 to -0.027	
L2-RP	yes	0.700	0.476	0.923	5.62	4.71	-0.112 to -0.102	0.067 to 0.080	
TA 1	yes	0.648	0.393	0.902	4.79	4.00	-0.168 to -0.150	0.117 to 0.133	
ME:L2-R1	yes	0.500	0.354	0.646	4.17	3.50			
ME:L2-R3	yes	0.566	0.433	0.698	5.00	4.21			
ME:L2-RP	yes	0.477	0.394	0.561	5.00	4.21			

Winner: **L2-R3**. Co-winners: L2-R3. Recommendation: **L2-R3**. Most spending: L2-R3. Highest S, admissible or not: L2-R3. Rows marked ME: are the ladder with month-end fills; S - S_winner and S_L2-R1 - S_layer are 90% bootstrap intervals over paths (1,000 resamples, seed (20261109, 7)). Admissibility failures name the gate (ruin, sc99, G, p10) and the core worlds where it fails.

Floor robustness: with the ruin floor in G at 0.1% of the start the recommendation is L2-R3 (co-winners L2-R3); at 10%, L2-R3 (co-winners L2-R3).

Table R2. World-model check: S with one scored world left out, and by family

Reading	HOLD	L2-R1	L2-R3	L2-RP	TA 1	Highest
without CALM_F	0.000	0.809	0.849	0.739	0.674	L2-R3
without CALM_M	0.000	0.809	0.849	0.739	0.679	L2-R3
without EUPH_F	0.000	0.740	0.750	0.652	0.607	L2-R3
without EUPH_M	0.000	0.746	0.781	0.676	0.625	L2-R3
without DECAY	0.000	0.809	0.849	0.739	0.680	L2-R3
without WILD	0.000	0.735	0.758	0.651	0.616	L2-R3
without UPSH	0.000	0.763	0.811	0.701	0.652	L2-R3

Reading	HOLD	L2-R1	L2-R3	L2-RP	TA 1	Highest
without BASE	0.000	0.708	0.734	0.646	0.595	L2-R3
without DAMP	0.000	0.876	0.935	0.793	0.738	L2-R3
without FAD	0.000	0.754	0.808	0.689	0.650	L2-R3
without BROK	0.000	0.754	0.749	0.671	0.608	L2-R1
cycle family alone	0.000	0.435	0.508	0.476	0.393	L2-R3
statistical family alone	0.000	1.111	1.105	0.923	0.902	L2-R1

A reading, as F011 Table A6b: not part of the decision.

Table R3. G (Bitcoin kept against a holder, years 10 to 14) at c*, by layer and world

Layer	CALM_F	CALM_M	EUPH_F	EUPH_M	DECAY	WILD	UPSH	BASE	DAMP	FAD	BROK	NOREV
L2-R1	1.00	1.00	2.30	2.15	1.00	2.44	1.74	4.48	1.64	3.41	3.41	0.68
L2-R3	1.00	1.00	3.27	2.26	1.00	2.98	1.58	4.66	1.40	2.99	4.27	0.74
L2-RP	1.00	1.00	2.85	2.13	1.00	2.88	1.59	3.46	1.44	2.69	3.00	0.97
TA 1	1.08	1.01	2.42	1.94	1.00	2.18	1.41	3.37	1.44	2.44	3.13	0.72
ME:L2-R1	1.00	1.00	2.08	1.95	1.00	2.10	1.41	2.55	1.29	2.07	1.95	0.57
ME:L2-R3	1.00	1.00	2.99	2.08	1.00	2.51	1.33	2.83	1.22	2.03	2.34	0.63
ME:L2-RP	1.00	1.00	2.74	1.88	1.00	2.48	1.23	2.21	1.20	1.80	1.97	0.65

HOLD is 1.00 by definition. Intramonth label (F010 Section 12): every result of a layer that fills on daily closes uses F010's resampled intramonth library, in which simulated dips in the largest-move months run 1.25 to 1.52 times deeper than history's (which helps buy orders fill) and, in the statistical worlds, highs reach 0.77 to 0.83 of history's. Month-end-fill rows are free of it.

Table R4. 10th percentile of the cycle-averaged ratio at c*

Layer	CALM_F	CALM_M	EUPH_F	EUPH_M	DECAY	WILD	UPSH	BASE	DAMP	FAD	BROK	NOREV
L2-R1	1.00	1.00	1.58	1.51	1.00	1.26	0.98	1.60	1.00	1.35	1.00	0.03
L2-R3	1.00	1.00	2.19	1.58	1.00	1.35	0.98	1.57	1.00	1.23	1.00	0.03
L2-RP	1.00	1.00	2.27	1.33	1.00	1.20	0.83	1.49	1.00	1.20	1.00	0.17
TA 1	1.00	1.00	1.71	1.41	1.00	1.29	1.04	1.56	1.01	1.30	1.18	0.04
ME:L2-R1	1.00	1.00	1.43	1.37	1.00	1.10	0.89	1.17	1.00	1.02	1.00	0.03
ME:L2-R3	1.00	1.00	1.94	1.45	1.00	1.14	0.90	1.20	1.00	1.00	1.00	0.03
ME:L2-RP	1.00	1.00	2.13	1.05	1.00	1.08	0.74	1.03	0.94	1.00	1.00	0.05

Table R5. Share of paths that hit the ruin floor in G (1% of the start), by layer and world

Layer	CALM_F	CALM_M	EUPH_F	EUPH_M	DECAY	WILD	UPSH	BASE	DAMP	FAD	BROK	NOREV
L2-R1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.10%	0.10%	0.0%	0.20%	0.0%	67.9%
L2-R3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.10%	0.10%	0.0%	0.20%	0.0%	67.2%
L2-RP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.10%	0.05%	0.0%	0.20%	0.0%	57.3%
TA 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.10%	0.05%	0.0%	0.20%	0.0%	66.5%

Layer	CALM_F	CALM_M	EUPH_F	EUPH_M	DECAY	WILD	UPSH	BASE	DAMP	FAD	BROK	NOREV
ME:L2-R1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.10%	0.15%	0.0%	0.20%	0.0%	68.5%
ME:L2-R3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.10%	0.10%	0.0%	0.20%	0.0%	67.8%
ME:L2-RP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.10%	0.05%	0.0%	0.20%	0.0%	63.9%

Table R6. SC99 by layer and world

Layer	CALM_F	CALM_M	EUPH_F	EUPH_M	DECAY	WILD	UPSH	BASE	DAMP	FAD	BROK	NOREV
HOLD	85%	100%	90%	110%	80%	90%	120%+	50%	80%	55%	25%	0%-
L2-R1	85%	100%	110%	120%+	80%	95%	120%+	55%	85%	60%	25%	0%-
L2-R3	85%	100%	120%+	120%+	80%	95%	120%+	55%	85%	60%	25%	0%-
L2-RP	85%	100%	120%+	120%+	80%	95%	120%+	55%	85%	60%	25%	0%-
TA 1	85%	100%	110%	120%+	80%	95%	120%+	55%	85%	60%	25%	0%-
ME:L2-R1	85%	100%	110%	120%+	80%	95%	120%+	55%	80%	60%	25%	0%-
ME:L2-R3	85%	100%	120%+	120%+	80%	95%	120%+	55%	80%	60%	25%	0%-
ME:L2-RP	85%	100%	120%+	120%+	80%	95%	120%+	55%	80%	60%	25%	0%-

- : left-censored (ruin above 1% even at the lowest coverage tried); + : right-censored (the grid top, 120%). HOLD's row is c*.

Table R7. Ruin at c* by layer and world

Layer	CALM_F	CALM_M	EUPH_F	EUPH_M	DECAY	WILD	UPSH	BASE	DAMP	FAD	BROK	NOREV
HOLD	0.45%	0.25%	0.0%	0.20%	0.15%	0.15%	0.25%	0.25%	0.15%	0.25%	0.25%	62.2%
L2-R1	0.45%	0.25%	0.0%	0.0%	0.15%	0.05%	0.05%	0.05%	0.10%	0.10%	0.20%	58.4%
L2-R3	0.45%	0.25%	0.0%	0.0%	0.15%	0.0%	0.05%	0.05%	0.10%	0.10%	0.20%	57.3%
L2-RP	0.45%	0.25%	0.0%	0.0%	0.15%	0.05%	0.05%	0.05%	0.10%	0.15%	0.20%	57.5%
TA 1	0.15%	0.15%	0.0%	0.0%	0.15%	0.0%	0.25%	0.05%	0.10%	0.15%	0.10%	57.9%
ME:L2-R1	0.45%	0.25%	0.0%	0.0%	0.15%	0.05%	0.10%	0.10%	0.10%	0.15%	0.20%	60.1%
ME:L2-R3	0.45%	0.25%	0.0%	0.0%	0.15%	0.0%	0.10%	0.05%	0.10%	0.15%	0.20%	58.8%
ME:L2-RP	0.45%	0.25%	0.0%	0.0%	0.15%	0.05%	0.05%	0.05%	0.15%	0.20%	0.20%	59.1%

Table R8. Stress worlds: G at c*

World	HOLD	L2-R1	L2-R3	L2-RP	TA 1
UPSH	1.00	1.74	1.58	1.59	1.41
BROK	1.00	3.41	4.27	3.00	3.13
NOREV	1.00	0.68	0.74	0.97	0.72

Below 0.80: L2-R1 in NOREV (0.68); L2-R3 in NOREV (0.74); TA 1 in NOREV (0.72).

Table R9-TREND. Decision rule from the trend (statistical worlds)

Layer	Admissible	S	S_cyc	S_stat	D	D (all worlds)	S - S_winner, 90%	S_L2-R1 - S_layer, 90%	Admissibility failures
HOLD	yes	0.000	—	0.000	0.00	0.00	-1.181 to -1.134		
L2-R1	yes	1.158	—	1.158	3.75	3.00	0.000 to 0.000		
L2-R3	yes	1.140	—	1.140	3.75	3.00	-0.032 to -0.005	0.005 to 0.032	
L2-RP	yes	0.947	—	0.947	3.75	3.00	-0.226 to -0.197	0.197 to 0.226	
TA 1	yes	0.975	—	0.975	3.75	3.00	-0.200 to -0.166	0.166 to 0.200	
ME:L2-R1	yes	0.701	—	0.701	1.25	1.00			
ME:L2-R3	yes	0.750	—	0.750	1.25	1.00			
ME:L2-RP	yes	0.596	—	0.596	1.25	1.00			

Winner: **L2-R1**. Co-winners: L2-R1. Recommendation: **L2-R1**. Most spending: L2-R1. Highest S, admissible or not: L2-R1. S and D are over the four scored statistical worlds; the month-end condition and D ≥ −1.25 apply.

Layer	BASE	DAMP	FAD	BROK	NOREV
L2-R1	4.67	1.78	3.54	3.50	0.49
L2-R3	4.80	1.48	3.08	4.39	0.57
L2-RP	3.47	1.53	2.71	3.08	0.80
TA 1	3.69	1.51	2.65	3.34	0.56
ME:L2-R1	2.71	1.35	2.20	2.06	0.41
ME:L2-R3	3.01	1.26	2.13	2.49	0.47
ME:L2-RP	2.28	1.24	1.85	2.08	0.51

G at c* by world from trend.

Table R9-PEAK. Decision rule from 2.5× trend (statistical worlds)

Layer	Admissible	S	S_cyc	S_stat	D	D (all worlds)	S - S_winner, 90%	S_L2-R1 - S_layer, 90%	Admissibility failures
HOLD	yes	0.000	—	0.000	0.00	0.00	-1.685 to -1.642		
L2-R1	yes	1.664	—	1.664	31.25	25.00	0.000 to 0.000		
L2-R3	yes	1.656	—	1.656	32.50	26.00	-0.024 to 0.009	-0.009 to 0.024	
L2-RP	yes	1.409	—	1.409	30.00	24.00	-0.271 to -0.239	0.239 to 0.271	

Layer	Admissible	S	S_cyc	S_stat	D	D (all worlds)	S - S_winner, 90%	S_L2-R1 - S_layer, 90%	Admissibility failures
TA 1	yes	1.228	—	1.228	12.50	10.00	-0.454 to -0.414	0.414 to 0.454	
ME:L2-R1	yes	1.210	—	1.210	28.75	23.00			
ME:L2-R3	yes	1.279	—	1.279	32.50	26.00			
ME:L2-RP	yes	1.057	—	1.057	28.75	23.00			

Winner: **L2-R1**. Co-winners: L2-R1, L2-R3. Recommendation: **L2-R1**. Most spending: L2-R3. Highest S, admissible or not: L2-R1. S and D are over the four scored statistical worlds; the month-end condition and D ≥ -1.25 apply.

Layer	BASE	DAMP	FAD	BROK	NOREV
L2-R1	7.83	3.02	6.00	5.47	0.40
L2-R3	8.45	2.23	5.27	7.59	0.51
L2-RP	5.60	2.47	4.31	4.70	0.71
TA 1	4.86	1.95	3.48	4.13	0.39
ME:L2-R1	4.57	2.28	3.72	3.26	0.35
ME:L2-R3	5.31	1.93	3.70	4.38	0.43
ME:L2-RP	3.68	1.97	2.96	3.21	0.46

G at c* by world from peak.

Table R10. Intramonth swings × 0.75 and × 1.25 (secondary; month-end condition not re-applied)

Swings	S HOLD	S L2-R1	S L2-R3	S L2-RP	S TA 1	Admissible	Co-winners	Recommendation
× 0.75	0.000	0.642	0.693	0.602	0.648	HOLD, L2-R1, L2-R3, L2-RP, TA 1	L2-R3	L2-R3
× 1.25	0.000	0.943	0.934	0.825	0.648	HOLD, L2-R1, L2-R3, L2-RP, TA 1	L2-R1	L2-R1

L2-R3 and L2-RP from F011-R's runs, L2-R1 from F011's shape-scale runs, TA 1 and HOLD from the primary run (TA 1 trades only at month-ends).

Table R11. Lower spending (secondary; SC99 and D from the primary run; month-end condition not re-applied)

Level	S HOLD	S L2-R1	S L2-R3	S L2-RP	S TA 1	Admissible	Co-winners	Recommendation
half of c*	0.000	0.668	0.669	0.583	0.553	HOLD, L2-R1, L2-R3, L2-RP, TA 1	L2-R1, L2-R3	L2-R1
5% coverage	0.000	0.633	0.622	0.543	0.521	HOLD, L2-R1, L2-R3, L2-RP, TA 1	L2-R1	L2-R1

Table R12. The 30-year reading at c*: median Bitcoin-equivalent at month 360, and share of paths at or above a holder's

World	HOLD	L2-R1	L2-R3	L2-RP	TA 1
CALM_F	0.14	0.14 / 1%	0.14 / 1%	0.14 / 1%	0.27 / 100%
CALM_M	0.15	0.15 / 0%	0.15 / 0%	0.15 / 0%	0.19 / 100%
EUPH_F	0.18	0.57 / 100%	0.89 / 100%	0.72 / 100%	0.93 / 100%
EUPH_M	0.16	0.48 / 100%	0.50 / 100%	0.45 / 97%	0.50 / 100%
DECAY	0.13	0.13 / 0%	0.13 / 0%	0.13 / 0%	0.13 / 100%
WILD	0.23	2.41 / 100%	3.44 / 100%	3.25 / 100%	2.14 / 100%
UPSH	0.19	0.04 / 1%	0.05 / 3%	0.54 / 85%	0.01 / 0%
BASE	0.50	29.90 / 100%	33.73 / 100%	11.04 / 100%	14.66 / 100%
DAMP	0.31	1.28 / 98%	0.71 / 96%	0.76 / 93%	1.00 / 100%
FAD	0.48	2.86 / 98%	1.63 / 96%	1.54 / 96%	1.96 / 100%
BROK	0.42	2.03 / 86%	3.04 / 86%	1.83 / 86%	4.36 / 100%
NOREV	0.00	0.00 / 35%	0.00 / 40%	0.00 / 53%	0.00 / 38%

Each cell: median Bitcoin-equivalent at month 360 (ruined paths count 0) / share of paths at or above HOLD's on the same path, counting only paths where at least one of the two is alive.

Table R13. Sweet-spot metrics at c*, HOLD, L2-R1 and the three rivals (reported, not scored)

World	Layer	Drawdown cover	Paths with a spell	Dry powder	Max real drawdown (median)	Bitcoin sold below the trend (median)	Real wealth at month 96 (× start)	Bitcoin-equivalent at month 144 (median)	at month 360 (median)
CALM_F	HOLD	—	0%	0%	69%	0.79	2.85	0.23	0.14
CALM_F	L2-R1	0%	0%	0%	69%	0.79	2.85	0.23	0.14
CALM_F	L2-R3	0%	1%	0%	69%	0.79	2.85	0.23	0.14
CALM_F	L2-RP	0%	0%	0%	69%	0.79	2.85	0.23	0.14
CALM_F	TA 1	0%	99%	0%	67%	0.82	2.90	0.25	0.27
CALM_M	HOLD	—	0%	0%	55%	0.71	3.59	0.23	0.15
CALM_M	L2-R1	0%	0%	0%	55%	0.71	3.59	0.23	0.15
CALM_M	L2-R3	73%	0%	0%	55%	0.71	3.59	0.23	0.15
CALM_M	L2-RP	0%	0%	0%	55%	0.71	3.59	0.23	0.15
CALM_M	TA 1	0%	26%	0%	53%	0.71	3.61	0.23	0.19
EUPH_F	HOLD	—	0%	0%	83%	0.70	3.32	0.28	0.18
EUPH_F	L2-R1	0%	60%	0%	69%	0.70	6.69	0.66	0.57
EUPH_F	L2-R3	0%	100%	2%	68%	0.66	9.26	0.98	0.89
EUPH_F	L2-RP	0%	94%	0%	68%	0.69	8.07	0.82	0.72
EUPH_F	TA 1	0%	100%	0%	71%	0.81	6.81	0.66	0.93
EUPH_M	HOLD	—	0%	0%	75%	0.65	4.03	0.26	0.16
EUPH_M	L2-R1	0%	58%	0%	55%	0.65	7.60	0.57	0.48

World	Layer	Drawdown cover	Paths with a spell	Dry powder	Max real drawdown (median)	Bitcoin sold below the trend (median)	Real wealth at month 96 (× start)	Bitcoin-equivalent at month 144 (median)	at month 360 (median)
EUPH_M	L2-R3	56%	100%	7%	54%	0.48	7.89	0.60	0.50
EUPH_M	L2-RP	35%	97%	3%	54%	0.54	7.53	0.54	0.45
EUPH_M	TA 1	0%	80%	0%	60%	0.67	6.89	0.49	0.50
DECAY	HOLD	—	0%	0%	58%	0.85	2.60	0.23	0.13
DECAY	L2-R1	—	0%	0%	58%	0.85	2.60	0.23	0.13
DECAY	L2-R3	—	0%	0%	58%	0.85	2.60	0.23	0.13
DECAY	L2-RP	—	0%	0%	58%	0.85	2.60	0.23	0.13
DECAY	TA 1	0%	30%	0%	58%	0.85	2.60	0.23	0.13
WILD	HOLD	—	0%	0%	84%	0.63	4.36	0.32	0.23
WILD	L2-R1	0%	95%	0%	71%	0.63	7.69	0.75	2.41
WILD	L2-R3	42%	100%	12%	71%	0.55	8.62	0.89	3.44
WILD	L2-RP	7%	100%	2%	70%	0.61	8.56	0.88	3.25
WILD	TA 1	0%	100%	9%	70%	1.65	6.92	0.64	2.14
UPSH	HOLD	—	0%	0%	70%	0.56	5.08	0.22	0.19
UPSH	L2-R1	0%	49%	0%	59%	0.56	8.90	0.34	0.04
UPSH	L2-R3	75%	79%	3%	59%	0.45	8.47	0.31	0.05
UPSH	L2-RP	54%	77%	0%	61%	0.51	8.22	0.32	0.54
UPSH	TA 1	0%	30%	0%	62%	0.56	7.19	0.28	0.01
BASE	HOLD	—	0%	0%	95%	0.43	6.54	0.56	0.50
BASE	L2-R1	0%	84%	0%	76%	0.43	17.24	2.27	29.90
BASE	L2-R3	28%	100%	11%	76%	0.39	17.84	2.31	33.73
BASE	L2-RP	30%	99%	22%	85%	0.41	15.23	1.75	11.04
BASE	TA 1	0%	100%	35%	75%	11.87	15.15	1.77	14.66
DAMP	HOLD	—	0%	0%	72%	0.59	5.24	0.38	0.31
DAMP	L2-R1	0%	64%	0%	56%	0.59	6.98	0.59	1.28
DAMP	L2-R3	71%	97%	14%	58%	0.52	6.76	0.52	0.71
DAMP	L2-RP	49%	96%	6%	57%	0.55	6.67	0.52	0.76
DAMP	TA 1	0%	90%	0%	55%	0.75	6.29	0.51	1.00
FAD	HOLD	—	0%	0%	83%	0.45	6.39	0.53	0.48
FAD	L2-R1	0%	66%	0%	62%	0.45	14.58	1.65	2.86
FAD	L2-R3	70%	99%	13%	62%	0.39	14.34	1.39	1.63
FAD	L2-RP	58%	97%	13%	67%	0.42	13.30	1.31	1.54
FAD	TA 1	0%	96%	10%	65%	0.81	12.56	1.20	1.96
BROK	HOLD	—	0%	0%	97%	0.57	2.70	0.62	0.42
BROK	L2-R1	0%	51%	0%	95%	0.57	6.36	1.77	2.03
BROK	L2-R3	6%	86%	8%	95%	0.56	7.70	2.23	3.04
BROK	L2-RP	4%	67%	5%	95%	0.57	6.08	1.70	1.83
BROK	TA 1	0%	96%	47%	92%	3.83	6.05	1.79	4.36

World	Layer	Drawdown cover	Paths with a spell	Dry powder	Max real drawdown (median)	Bitcoin sold below the trend (median)	Real wealth at month 96 (× start)	Bitcoin-equivalent at month 144 (median)	at month 360 (median)
NOREV	HOLD	—	0%	0%	100%	0.94	0.53	0.00	0.00
NOREV	L2-R1	0%	25%	0%	100%	0.96	0.98	0.00	0.00
NOREV	L2-R3	21%	43%	13%	100%	0.96	1.18	0.00	0.00
NOREV	L2-RP	24%	39%	33%	100%	0.96	1.14	0.01	0.00
NOREV	TA 1	0%	47%	20%	100%	0.99	1.01	0.00	0.00

Definitions as F011 Table A9. Ruined paths count as zero in the Bitcoin-equivalent columns.

Table R14. Predictions

Prediction	Result
R-P1	not supported
R-P2	supported
R-P3	supported
R-P4	supported
R-P5	supported