

Holding the Nasdaq overnight in place of a random-side bracket: the overnight premium in a proprietary-trading evaluation

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Abstract

The companion paper prices what the rulebook of Prime Academy FX pays a trader with no edge: one random-side bracket a day on EURUSD, a pass rate just under one half, and a funded account that pays about half the time. This paper puts a position with a positive expected return in the random-side bracket's place. The Nasdaq's drift accrues while the cash market is shut, and the firm's cash-index contract charges its financing only at the daily rollover, so a long position opened after the evening reopen and closed before the cash open collects the night and pays no swap. We ask three things. *Is the night paid?* On 6,899 nights of QQQ since 1999 the close-to-open mean is +5.61 basis points at $t = +5.17$, positive in every three-year block, against -0.04 for the day. On 654 nights of the micro Nasdaq future, replayed through the framework's broker over the exact hours held, the night nets +3.90 basis points after the firm's spread and commission, at $t = +1.48$: the same size, and too short a sample to resolve it alone. *What does the rulebook pay it?* With a drift the pass rate is a logistic in the drift over the position size, so the sizing rule of the random-side bracket turns around: a smaller position passes more often and more slowly. *Does it beat the random-side bracket?* It depends on one number. At the long-run 4 basis points a night the best configuration within the companion paper's limits pays \$514 a year on a \$1,000 bankroll against the bracket's \$148, passes 46.8% against 43.8%, and needs a probability of only 21% that the firm pays. At no drift it pays \$48 and falls outside the limits, because an equity loss limit read inside the night stops out dips that would have recovered. The two plans pay the same at 0.9 basis points a night. What the data cannot settle is whether the firm pays, and whether its risk team accepts a trading history that is always long at the same hours.

Words used in this paper

night	18:05 to 09:25 New York. Its <i>first part</i> is 18:05 to 03:00.
drift	The mean return of a night, in basis points. A basis point is 0.01%.
overnight premium	The part of the drift earned while the cash equity market is closed.
random-side	The companion paper's plan: one EURUSD trade a day, long or short at random, with a stop-loss and a profit target. Its expected return is zero before costs.
bracket	The firm's name for its evaluation: passed by making 9% before losing 9%.
assessment	The account given after the assessment. It pays out.
funded account	The size of the account bought from the firm: \$3,000 or \$100,000.
account balance	The trader's own cash. It buys assessments and receives payouts. It starts at \$1,000.
bankroll	
lot	10 index units of NDX100, the firm's Nasdaq contract.
rollover, swap	17:00 New York, when the firm books its daily financing charge, the swap.
sample	The nights measured: every weekday morning from 2024-01-03 to 2026-09-09 whose night can be entered and exited on the bars.
ledger	One row a night from the broker replay: entry fill, exit fill, and the lowest price while held.
G, T, D	Net cash a year, days to first cash, and the 90th percentile of the bankroll's largest fall in its first year.
risk of ruin	The probability that the bankroll cannot buy another assessment within three years.
breakeven	The smallest probability that the firm pays at which the bankroll grows.
probability p^*	
within the limits	Risk of ruin at most 5%, any payout at least 50%, the bankroll grows if the firm pays, and the breakeven probability plus two standard errors under 80%.

1 The answer

This section is the paper's decisions. A reader who stops at its end has the plan, the comparison with the random-side bracket, and what could make it wrong. Every number in it is derived or measured in the section named beside it.

The plan. Buy a Prime Academy FX evaluation. Each evening, buy the firm's Nasdaq contract five minutes after the market reopens and sell it five minutes before the New York cash open. Pass the assessment by making 9% before losing 9%; then draw payouts from the funded account until it dies. No forecast is made. The position is the same every night. The profit has two sources: the rulebook's asymmetry, which the companion paper prices, and the night's drift, which this paper adds.

Reading Table 2. Each column is defined as in the companion paper. *Pass* is the chance one purchase passes the assessment. *Days to pass* is the median calendar time of the purchases that pass. *Any payout* is the chance a funded account pays at least once. *Cash / fee* is the split of everything one purchase withdraws, on average, over its \$38 fee. *Days to first cash* is the median day the bankroll first receives a payout, counting failed purchases and their replacements. *Cash a year* is the long-run net cash rate of Proposition 2. *Drawdown* is the 90th percentile of the bankroll's largest fall in its first year. *Ruin* is the chance the bankroll cannot buy again within three years. The *breakeven probability* is the smallest probability that the firm pays at which the bankroll grows. A row is *within limits* when ruin is at most 5%, any payout at least 50%, the bankroll grows if the firm pays, and the breakeven probability plus two standard errors is under 80%.

The bracket's row is the baseline: it passes 43.8%, its funded account pays 50.7% of the time, and the bankroll nets \$148 a year. The row at no drift is the night with its premium taken away. It is worse than the bracket on every column and outside the limits. The night is not a better

setting	value	where it comes from
instrument	NDX100, the firm's Nasdaq cash contract	Section 2
direction	long, every night	Section 3
entry	18:05 New York, Sunday to Thursday. In Jakarta: 05:05 the next morning in the US summer, 06:05 in the US winter	Section 4
exit	09:25 New York. In Jakarta: 20:25 in the US summer, 21:25 in the US winter	Section 4
high-impact USD release	exit 15 minutes before it, and stay out until the evening. For an 08:30 release that is 08:15 New York	Section 4
size in the assessment	0.08 lots on the \$3,000 account, 7.8 times the account balance	Section 6
size once funded	0.03 lots, 2.9 times the account balance	Section 6
stop	each night, the tighter of the room left to the 9% loss limit and 4.5% of yesterday's equity, which is 58 basis points under the entry in the assessment. The plan's own stop: none	Section 5
swap	none: the position is flat at the 17:00 New York rollover	Section 2
account size, accounts purchase	\$3,000, one account, a \$1,000 bankroll not before the four checks of Section 10	companion paper Section 10

Table 1: The plan. Sizes are the configuration with the most cash a year within the limits at a drift of 4 basis points a night. At 0.05 lots in the assessment the cash a year is the same within the simulation's noise and the bankroll's drawdown is smaller (Section 6).

plan	sizing	pass	to pass, d	any pay	cash / fee	T , d	G , \$/yr	D	ruin	p^*	limits
random-side bracket, companion paper	3%, then 1.62%	43.8%	13	50.7%	1.50	101	\$148	\$405	0.7%	50%	yes
night, 0 bp	0.05, then 0.04 lots	38.3%	18	23.8%	1.24	293	\$67	\$456	3.9%	none	no
night, 2 bp	0.05, then 0.02 lots	45.2%	18	50.7%	2.67	213	\$194	\$266	0.0%	31%	yes
night, 4 bp	0.08, then 0.03 lots	46.8%	11	50.3%	3.92	135	\$514	\$380	0.3%	21%	yes
night, sample (4.5 bp)	0.08, then 0.03 lots	48.0%	11	53.2%	4.57	128	\$579	\$362	0.2%	17%	yes
first part, 2 bp	0.08, then 0.03 lots	45.6%	17	51.5%	3.13	225	\$220	\$304	0.1%	34%	yes
first part, sample (3.5 bp)	0.08, then 0.05 lots	51.4%	17	50.4%	4.54	147	\$596	\$339	0.1%	16%	yes

Table 2: The random-side bracket and the night, through one simulator: \$1,000 bankroll, \$3,000 account, three years, every payout paid. The first row is the companion paper's fastest configuration within its limits, sized as a share of the account balance risked per trade. Each later row is the configuration with the most cash a year within the limits at that row's drift, or, where none is within them, the one with the most cash a year, sized in lots in the assessment and then once funded. "First part" holds 18:05 to 03:00 only. Times are in days. T is days to first cash, G cash a year, D the 90th-percentile drawdown, p^* the breakeven probability.

vehicle for a zero-edge strategy: Section 5 shows why. The rows at 2 and 4 basis points and at the sample's own 4.5 show what the premium buys. At 4 basis points the night passes 46.8%, its funded account pays 50.3% of the time, a purchase returns 3.92 times its fee, and the bankroll nets \$514 a year. Days to first cash are longer than the bracket's, 135 against 101: the funded position that keeps the payout rate above one half is small, so the first request takes longer to reach.

The decision. The night beats the bracket when its gross drift is above 0.9 basis points a night (Section 7). The QQQ history since 1999 puts the drift at +5.61 basis points with $t = +5.17$, and the sample at +4.55 with a standard error of 2.62. So the evidence favours the night, and it does not prove it: the sample alone leaves a drift of zero inside two standard errors. The plan is within the companion paper's limits from 4 basis points as sized here, and from 2 with a smaller funded position.

The larger account. The plan above is on the \$3,000 account. On the firm's \$100,000 account, at the same leverage, the fee and the minimum payout are smaller against the account balance, and the bankroll nets \$9,411 a year at 2 basis points and \$20,771 at 4, against \$205 and \$526 (Section 8). At no drift 9 configurations are within the limits there, and none is on the \$3,000 account. Those figures are from one seed.

1.1 What could make it wrong

- *The swap.* The plan assumes the firm books its swap once a day at 17:00 New York and nothing on a position opened and closed between two rollovers. One position on the evaluation account that crossed 17:00 paid 1.64 basis points after 70 minutes (Section 2), so the charge follows the crossing. A position inside two rollovers is not yet read. If a swap is charged on this hold anyway, the long side pays 1.63 basis points a night, which is 42% of the night's net mean.
- *The spread at night.* The 1.4-point spread was read at 07:38 and 13:40 UTC. A spread twice as wide at 18:05 New York takes another 0.5 basis points from each night.
- *The drift.* Two and a half years of a rising market cannot tell 4 basis points from zero. At zero the plan loses to the bracket.
- *The firm.* A trading history that is long every night at the same two times is a pattern the risk team can name. The rulebook lists "exploiting overnight financing or rollover rates" among prohibited acts. Closing before the rollover is not that, and the firm's discretion over payouts is absolute.
- *The contract.* The price history is the micro future. The contract traded is the firm's cash CFD, whose quote is the dealer's.

2 The plan and the rules

The account rules are the companion paper's and are not re-derived. The assessment passes at +9% of the initial balance and fails at -9%, a loss limit that does not trail. A loss of more than 5% of the previous day's equity in one day ends the account. Both are read on equity, so an open loss counts. A funded account may request a payout 14 days after the last one, of at least \$100 after the 70% split, and no single day may be more than 35% of the amount requested. A payout returns the balance to its start. Account sizes run from \$3,000 for a \$38 fee to \$100,000 for \$560. Sizes scale with the account size: 0.01 lot on \$3,000 is a third of a lot on \$100,000.

term	value
contract	NDX100, “Nasdaq Cash”, one lot = 10 index units
price at the reading	29,092.17
spread	1.40 points
commission	\$5.00 a lot at the open, 0.50 points
round trip	1.90 points, 0.65 bp of the price
swap, long	\$47.50 a lot a night, 1.63 bp, triple on Friday
swap, short	\$12.39 a lot a night, credited
smallest position	0.01 lot, \$2,909 of index
leverage allowed	30

Table 3: The firm’s Nasdaq contract, read from its platform’s View Details dialog on 2026-09-16.

Reading Table 3. One lot is 10 index units, so a move of one index point is \$10 a lot. The spread of 1.4 points and the commission of \$5 a lot, which is 0.5 points, make a round trip of 1.9 points. At a price of 29,092 that is 0.65 basis points, a basis point being 0.01%. Every night in this paper is charged that amount. The long swap of \$47.50 a lot a night is 1.63 basis points of the position. The smallest position, 0.01 lot, is \$2,909 of index, which on the \$3,000 account is 0.97 times the account balance. Position sizes on that account therefore come in steps of about one account balance, and the paper states sizes in lots.

One position on the account. On 13 October 2026, a Tuesday, 0.01 lot was bought by hand at 30,577.94 eight minutes before the 17:00 New York rollover and sold 70 minutes after the purchase. The platform’s history card shows a swap of \$0.50, a commission of \$0.05 and a net of $-\$0.06$. The swap is \$50.00 a lot, which is 1.64 basis points of the position, and between 1.62 and 1.65 given that the card rounds to a cent. The rate of Table 3 is \$49.93 a lot at that price. The commission is \$5 a lot, charged at the open, and the closing side shows none. The card gives no time zone. The sale was placed at 05:01 in Jakarta, which puts the platform clock at UTC+3, and the New York times rest on that. Three things follow: the swap is the tabled rate on the day’s price, it is charged in full for crossing 17:00 whatever the time held, and the commission is as tabled. The card does not show the time the swap was booked, the night that carries three swaps, or a position opened after one rollover and closed before the next.

The cost against the bracket’s. The companion paper’s bracket pays 3.75% of its risk per trade: a 20-pip stop is small beside the commission, the spread and the exits around news releases. A night’s cost of 0.65 basis points sits beside a night’s standard deviation of 67, under 1% of it.

3 Who pays for the night

An edge is a payment from a participant who is constrained. The night’s payer is the holder who will not carry a gap: a fund that must be flat or hedged when the cash market is shut, a trader whose risk limit is read at the close. They sell before the close and buy back after the open, whatever the price. Whoever holds through the night carries the gap they shed, and is paid for it. This is the *insurance* reason: the payer accepts a worse price to lose a tail, and the collector’s cost is that tail.

The mechanism makes a prediction the price chart does not: the index’s drift should sit in the hours the cash market is shut, in every kind of market, and not in the hours it is open.

Reading Table 4. Over the whole QQQ history the night’s mean is +5.61 basis points at $t = +5.17$ and the day’s is -0.04 at $t = -0.02$. The night is negative in 0 of the 10 blocks. It was paid through the 2000 to 2002 collapse, through 2008, and through 2022, when the day lost. The t

years	n	night, bp	t	day, bp	t
1999–2001	706	+14.91	+2.69	−13.59	−1.26
2002–2004	756	+3.30	+0.96	−0.98	−0.16
2005–2007	754	+5.52	+3.36	−1.60	−0.50
2008–2010	757	+1.96	+0.56	+0.82	+0.14
2011–2013	754	+4.60	+1.95	+2.79	+0.88
2014–2016	756	+3.79	+1.56	+1.19	+0.40
2017–2019	754	+6.46	+2.95	+2.24	+0.67
2020–2022	756	+2.63	+0.62	+2.23	+0.44
2023–2025	752	+7.44	+2.63	+4.77	+1.23
2026–2026	154	+8.01	+1.09	+4.24	+0.53

Table 4: QQQ daily bars, 1999-03-11 to 2026-08-13, 6,899 nights. The night is the previous close to the open, the day the open to the close, each a mean in basis points with its t over that block’s nights.

within a single block is often under 2: three years is too short to resolve a mean of 4 basis points against a nightly standard deviation near 100. That is the same limit the next section meets.

From QQQ’s night to the night held. QQQ’s night runs from 16:00 to 09:30 and includes the two hours this plan is flat. QQQ’s holder also earns the risk-free rate, which a position held without financing does not: about 0.7 basis points a night at a 4% rate over 17.5 hours. Taking that off and rounding down gives the 4 basis points used as the long-run scenario.

4 The night in the futures price history

4.1 Data, sample and execution

The price path is the micro Nasdaq future, MNQ, in 1-minute bars from 2024-01-03 to 2026-09-09. The contract traded is the firm’s cash CFD. A dealer quotes a cash index outside cash hours as the future less a fair-value constant that it resets at the rollover, so between two rollovers the CFD’s return is the future’s.

The contract roll. The future’s continuous series changes contract four times a year, and the new contract is priced about 1% higher. In this file the change falls at 00:00 UTC, which is 19:00 or 20:00 New York: inside the night. A night that holds across it books a gain nobody earned. The 10 such nights are dropped. Left in, they would add about 1.7 basis points to the mean night.

The news rule. The firm forbids opening or closing within 10 minutes of a high-impact release. On a night with a high-impact USD release inside the window the sale is sent 15 minutes before it. Most of these are 08:30 releases, so the sale moves to 08:15.

The sample. Every weekday morning from 2024-01-03 to 2026-09-09 whose night can be entered and exited on the bars: 654 nights. 36 mornings have no bars at an entry or exit time, mostly holidays, and 2 are cut under an hour by a release. The schedule is pinned in the repository, so a later data pull cannot move it. A night takes 1.50 calendar days on average, so the 14-day payout clock is 10 nights.

Execution. `OvernightHoldStrategy` is replayed by the framework’s `HistoricalBarBroker`. A market order fills at the open of the next 1-minute bar. A stop fills at its own price, so a bar that runs through it books no slippage. Each night writes one ledger row: the entry fill, the exit fill, and the lowest bar low while held.

stop	nights	stopped, broker	stopped, ledger	largest difference, bp
1.0%	654	79	79	0.0000
1.5%	654	29	29	0.0000
2.0%	654	11	11	0.0000
3.0%	654	4	4	0.0000

Table 5: The replay against the ledger. A stop at each distance is replayed through the broker, and the same stop is read off the no-stop ledger: it fills at its price on any night whose low reaches it. The account simulator of Section 5 uses the second, so the two must agree night for night.

Reading Table 5. At each stop the broker and the ledger stop the same number of nights, and the largest difference in any night’s return is zero. The account simulator can therefore place a stop at any distance, including one that depends on the account’s equity, without a new replay.

4.2 The night, its two parts, and the day

window	New York hours	n	gross, bp	net, bp	s.d., bp	t	Sharpe	worst, bp	up
the night	18:05–09:25	654	+4.55	+3.90	67	+1.48	+0.91	−349	56.0%
its first part	18:05–03:00	654	+3.49	+2.84	46	+1.57	+0.96	−375	54.6%
its second part	03:00–09:25	654	+1.01	+0.36	47	+0.19	+0.12	−253	51.2%
the day (placebo)	09:35–15:55	654	+2.25	+1.60	103	+0.40	+0.24	−520	53.5%

Table 6: The same 654 mornings held over four windows. Gross is the mean return, net the mean after the 0.65-basis-point round trip. The t has one value per night. Sharpe is annualised. Up is the share of nights with a positive net return.

Reading Table 6. The whole night earns +4.55 basis points gross and +3.90 net, with a standard deviation of 67. Its t is +1.48 and its annualised Sharpe +0.91. The mean is the size the QQQ history predicts. The t is under 2, as the power calculation said it would be: a t of 2 on 654 nights needs a Sharpe of 1.2, and the premium sits near 0.9. The worst night lost −349 basis points.

The day is the placebo. The mechanism says the day is not paid. The same strategy from 09:35 to 15:55 on the same mornings earns +1.60 basis points at $t = +0.40$, with a standard deviation half again as large as the night’s. Had the day earned as much as the night, the sample would be saying only that the market rose. Over the whole sample it does not say that. By half it is less clean: the night nets +2.26 basis points on the first half and +5.53 on the second, the day +2.04 and +1.16. On the first half the two are level, and the night’s lead is made on the second.

The night’s two parts split unevenly: +2.84 basis points from 18:05 to 03:00 and +0.36 from 03:00 to 09:25. The difference between them is not resolved. A separate measurement of 2026 nights on the full-size future split the night evenly. That file holds 2 contract rolls inside its night, worth 1.9% together, and that measurement counted them as drift.

4.3 The pre-registered test

The test was declared before any night’s return was computed. The sample is cut at its middle night. On the first half, each of the three windows is scored at each of five stops, and the configuration with the highest mean over standard deviation is chosen. It is then scored once on the second half.

Reading Table 7. No configuration on the first half reaches a t of 2. A stop lowers the mean at every distance but the widest: on the whole night the mean falls from the no-stop row to the

window	stop	n	mean, bp	s.d., bp	t	mean / s.d.
the night	none	327	+2.26	65	+0.63	+0.0348
the night	1.0%	327	+1.86	58	+0.58	+0.0323
the night	1.5%	327	+1.63	62	+0.48	+0.0263
the night	2.0%	327	+1.20	64	+0.34	+0.0188
the night	3.0%	327	+2.26	65	+0.63	+0.0349
its first part	none	327	+2.25	44	+0.93	+0.0514
its first part	1.0%	327	+1.64	40	+0.74	+0.0409
its first part	1.5%	327	+1.04	43	+0.44	+0.0243
its first part	2.0%	327	+1.03	44	+0.42	+0.0234
its first part	3.0%	327	+2.48	42	+1.07	+0.0590*
its second part	none	327	-0.71	47	-0.27	-0.0150
its second part	1.0%	327	-0.47	45	-0.19	-0.0105
its second part	1.5%	327	-0.82	47	-0.32	-0.0176
its second part	2.0%	327	-1.11	48	-0.42	-0.0231
its second part	3.0%	327	-0.85	48	-0.32	-0.0178

Table 7: The first half of the sample, net of the round trip: three windows by five stops. * marks the configuration chosen.

2% row and returns at 3%, where the stop is reached on four nights in the whole sample. Nights that fall far tend to close above their low, so a stop sells near the bottom. The second part of the night is negative at every stop on this half. The chosen configuration is its first part with a stop of 3.0%, at a mean of +2.48 basis points and $t = +1.07$. Fifteen configurations were scored, and the choice among them is within their noise.

The holdout. On the second half the chosen configuration earns +3.42 basis points a night, with a standard deviation of 48, $t = +1.28$, an annualised Sharpe of +1.11, and 52.9% of nights up. The plain whole night on the same half earns +5.53 at $t = +1.44$. By the declared thresholds the result is *consistent*, a positive holdout mean, and not *resolved*, a t of 2 or more. It is not falsified: the holdout mean is positive and the day's mean is below the night's.

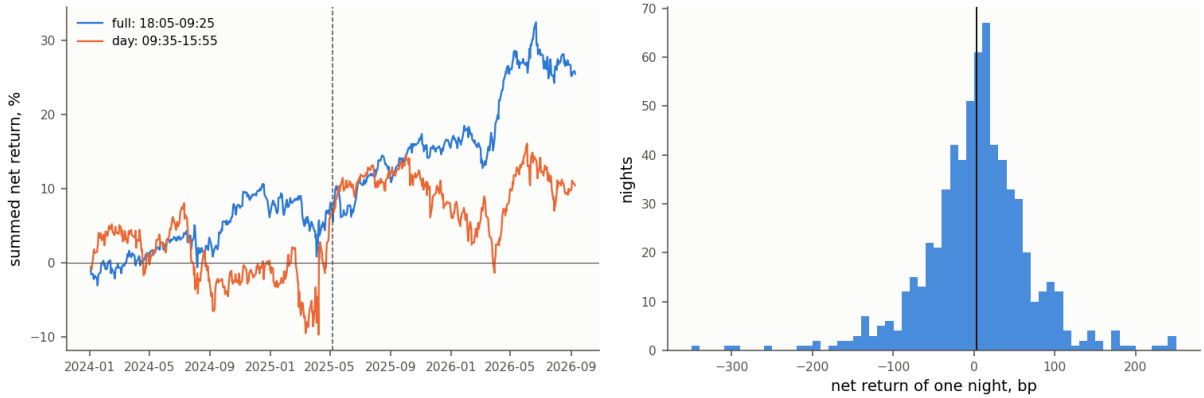


Figure 1: Left: the summed net return of the night and of the day on the same mornings; the dashed line is the split. Right: the net return of one night. A day line that ends at or above the night's would falsify the mechanism on this sample.

5 The account under a drift

5.1 The pass rate

Let a night's gross return be r with mean μ and standard deviation σ , the round trip c , and the position λ times the account balance. One night moves the equity by

$$X = \lambda(r - c),$$

with mean and variance

$$m = \lambda(\mu - c), \quad v = \lambda^2 \sigma^2.$$

Proposition 1 (The pass rate under a drift). *In the diffusion limit the assessment passes with probability*

$$P = \frac{1}{1 + e^{-\theta D}}, \quad \theta = \frac{2m}{v} = \frac{2(\mu - c)}{\lambda \sigma^2},$$

where $D = 9\%$ is both the target and the loss limit, and it takes

$$E[n] = \frac{D(2P - 1)}{\lambda(\mu - c)}$$

nights to resolve.

Proof. The exponential martingale of the companion paper's Section 4.3 gives, for a walk with drift m and variance v between a target T and a loss limit $-D$,

$$P = \frac{1 - e^{-\theta D}}{1 - e^{-\theta(T+D)}}.$$

With $T = D$ the denominator factors as

$$1 - e^{-2\theta D} = (1 - e^{-\theta D})(1 + e^{-\theta D}),$$

and the first factor cancels. The count of nights is Wald's identity, $E[\text{equity at the end}] = m E[n]$. The equity ends at $+D$ with probability P and at $-D$ otherwise, so

$$m E[n] = P D - (1 - P) D = D(2P - 1),$$

and dividing by m gives the result. □

The sizing rule reverses. The companion paper's random-side bracket has $\mu = 0$, so θ is negative: the cost is a drift against the trader. Then P rises with the position, because a larger position crosses the barriers in fewer trades and pays the cost fewer times, and the risk sits at the tightest rule. With $\mu > c$ the sign of θ is positive and everything turns over. P now *falls* as the position grows, and tends to one as it shrinks: a small position lets the drift accumulate against the noise. The price is time. $E[n]$ grows as $1/\lambda$. So the position has an interior optimum set by the clock, not a corner solution set by a rule.

Reading Table 8. The formula has the right shape: the pass rate falls and the count of nights falls as the position grows. Its levels are off, by more at larger positions. At the largest it gives a pass rate of 54.3% against a simulated 46.7%, and 3 nights against 8. Three things the diffusion leaves out account for it. The first is the equity loss limit inside the night, below: it stops a night's loss early, which lowers the mean and also shrinks the night's variance, so the walk is slower than $\lambda\sigma$ says. The second is overshoot: a winning night that carries the equity past $+9\%$ wastes the excess, while a loss is cut exactly at the loss limit. The third is that nights are drawn in blocks of ten from the sample, so a run of falling nights arrives together. The proposition is used for the direction of the sizing rule, and the simulator for every number.

lots	leverage	pass, formula	pass, simulated	nights, formula	nights, simulated
0.02	1.94	66.6%	65.3%	46	62
0.04	3.88	58.5%	53.0%	12	21
0.06	5.82	55.7%	49.7%	5	12
0.08	7.76	54.3%	46.7%	3	8

Table 8: Proposition 1 against the simulator, with no stop of the plan’s own, at a gross drift of 4 basis points.

5.2 The equity loss limit inside the night

Both of the firm’s loss rules are read on equity. A position that dips through a limit during the night ends the account even if it closes higher. So every night carries a stop, placed at the tightest of the plan’s own stop, the room left to the 9% loss limit, and 4.5% of the previous day’s equity, a margin inside the 5% daily rule.

For a price with no drift a stop costs nothing: a price that touches a level is as likely to go on as to come back. The nights in this sample are not like that. At 0.04 lots the daily-rule stop sits 116 basis points under the entry. It is reached on 9.0% of nights, and those nights close at -109 basis points on average: above the stop. Selling them at the stop costs 2.4 basis points of the account balance a night. A bracket has no such cost, because its stop is its outcome. This is why the night with its drift removed is a worse zero-edge vehicle than the bracket, and it is the main term the drift has to pay for.

5.3 The funded stage and the cash rate

The funded account is the same walk with a clock. A payout may be requested once 10 nights have passed, the equity is at least \$100 after the split, and the largest winning night is at most 35% of the request. A drift helps here twice: more accounts reach a first request, and an account that pays keeps its loss limit 9% below a balance that has been reset, so it goes on paying.

Proposition 2 (The cash rate, from the companion paper). *Let a purchase pass with probability P , take $E[n_A]$ nights to resolve the assessment, and, if it passes, withdraw a gross $E[W]$ of the account balance B over a funded life of $E[L_F]$ nights. With a fee F , a split α and d calendar days a night, the bankroll’s long-run net cash is*

$$G = \frac{365 (\alpha B P E[W] - F)}{d (E[n_A] + P E[L_F])}$$

dollars a year.

Here every term is simulated, with a funded account that is still alive after three years closed there. That makes G a lower bound when accounts outlive the horizon.

5.4 One simulator for both plans

The account simulator is the companion paper’s bankroll process: a \$1,000 bankroll buys one \$3,000 evaluation at a time, pays \$38 for each, and receives 70% of each payout. The bracket draws a two-point step with both outcomes cut at the account’s limits. The night draws a night from the ledger, in blocks of ten nights, and applies the stop above. Everything else is one code path.

Reading Table 9. The simulator reproduces the companion paper’s configuration to within a point on the two rates and within a few days and dollars on the rest. Its cash a year reads lower than the chains’, so the baseline the night is compared with is this simulator’s own \$148, not the larger published figure. A difference between the two plans in Table 2 is therefore not a difference between two models.

quantity	this simulator	the paper
pass rate	43.8%	44.0%
any payout	50.7%	51.1%
cash / fee	1.50	1.53
cash a year	\$148	\$159
days to first cash	101	104
drawdown, p90	\$405	\$409
ruin in three years	0.7%	0.6%
growth if it pays	+0.207	+0.216
breakeven belief	50%	50%

Table 9: The companion paper’s configuration (20-pip stop, 0.1-pip spread, 3% then 1.625%) through this paper’s simulator, against the companion paper’s own numbers from its exact chains.

6 Every configuration

The grid. Three settings are crossed on the whole night: the assessment size at 0.02, 0.03, 0.04, 0.05, 0.06 and 0.08 lots; the funded size at 0.01 to 0.06 lots; and the plan’s stop at none, 1%, 1.5%, 2% and 3%. That is 180 configurations, each run at four drifts: 0, 2 and 4 basis points and the sample’s own 4.5. The nights are shifted to each drift and their shape is kept. A drift is not searched: it is an input, and the tables below are read as “if the night pays this much”.

The limits. They are the companion paper’s. At 4 basis points 90 of the 180 configurations are within them, at 2 basis points 45, at no drift 0, and at the sample’s drift 90.

lots, assess	lots, funded	stop	pass	days to pass	any pay	cash / fee	T , days	G , \$/yr	D	ruin	p^*
0.08	0.03	none	47.3%	11	51.2%	3.98	134	\$526	\$380	0.2%	21%
0.08	0.03	2.0%	47.3%	11	51.2%	3.98	134	\$526	\$380	0.2%	21%
0.08	0.03	3.0%	47.3%	11	51.2%	3.98	134	\$526	\$380	0.2%	21%
0.08	0.03	1.5%	47.3%	11	50.8%	4.01	135	\$522	\$380	0.2%	21%
0.05	0.03	none	51.8%	18	51.5%	4.56	152	\$515	\$266	0.0%	15%
0.05	0.03	2.0%	51.8%	18	51.5%	4.56	152	\$515	\$266	0.0%	15%
0.05	0.03	3.0%	51.8%	18	51.5%	4.56	152	\$515	\$266	0.0%	15%
0.05	0.03	1.5%	51.8%	18	51.0%	4.57	153	\$509	\$266	0.0%	15%
0.06	0.03	none	50.3%	15	51.5%	4.26	140	\$509	\$303	0.1%	16%
0.06	0.03	2.0%	50.3%	15	51.5%	4.26	140	\$509	\$303	0.1%	16%
0.06	0.03	3.0%	50.3%	15	51.5%	4.26	140	\$509	\$303	0.1%	16%
0.06	0.03	1.5%	50.3%	15	51.5%	4.30	141	\$506	\$303	0.1%	16%
0.08	0.03	1.0%	47.3%	11	50.8%	4.02	143	\$486	\$372	0.2%	21%
0.04	0.03	none	53.6%	26	52.0%	4.73	174	\$480	\$258	0.0%	16%

Table 10: Gross drift 4 basis points a night: the fourteen configurations within the limits with the most cash a year. Lots are per \$3,000 of account balance; 0.01 lot is 0.97 times the account balance. T median days to first cash; G cash a year if the firm pays every request; D the 90th percentile year-one drawdown; ruin within three years; p^* the breakeven probability that the firm pays.

Reading Table 10. Four things, in order of how much they move.

The funded size is set by the payout limit. Every row of the table has the same funded size, 0.03 lots. A larger funded position withdraws more per payout and dies sooner, and the 35% rule asks for a larger request before the first payout, so fewer accounts pay. Across the whole grid the best chance of any payout is 86.2% at 0.01 lots, 66.6% at 0.02, 53.5% at 0.03 and 45.2% at 0.04, so 0.03 is the largest size that clears the 50% limit. The smaller sizes are within the limits and pay less: at most \$369 a year at 0.02 lots and \$162 at 0.01.

The assessment size trades the pass rate against the wait. Proposition 1 in the columns: a smaller assessment position passes more often and takes longer. At 0.02 lots the pass rate is 66.5%

and a pass takes a median 78 days; at 0.08 lots, 47.3% and 11 days. Cash a year divides by the time a purchase takes, and the two effects nearly cancel: from 0.05 to 0.08 lots the cash a year runs from \$509 to \$526, a spread the simulation's own noise covers. The declared rule takes the largest, 0.08 lots. A trader who wants the smaller drawdown takes 0.05 lots: a pass rate of 51.8%, \$515 a year, a drawdown of \$266 against \$380, and a breakeven probability of 15%.

The plan's own stop seldom binds. The equity rules already stop every night, and at these sizes theirs is the tighter stop: 93 basis points under the entry at 0.05 lots and 58 at 0.08. A plan stop of 1.5% or wider is never reached first in the assessment, so rows that differ only in the stop are often the same row. Where the 1% stop does bind, in the funded stage, it lowers the cash, as Table 7 showed on the price alone.

Ruin is not the binding limit. A \$38 fee against a \$1,000 bankroll leaves ruin near zero in every row. The limit that removes configurations is the payout rate.

lots, assess	lots, funded	stop	pass	days to pass	any pay	cash / fee	T , days	G , \$/yr	D	ruin	p^*
0.05	0.02	none	45.3%	18	50.4%	2.73	209	\$205	\$266	0.1%	32%
0.05	0.02	3.0%	45.3%	18	50.4%	2.73	209	\$205	\$266	0.1%	32%
0.04	0.02	none	45.1%	26	50.9%	2.77	237	\$192	\$265	0.0%	34%
0.04	0.02	3.0%	45.1%	26	50.9%	2.77	237	\$192	\$265	0.0%	34%
0.05	0.02	1.5%	45.3%	18	50.5%	2.74	227	\$191	\$266	0.1%	33%
0.04	0.02	1.5%	45.1%	26	51.6%	2.82	251	\$185	\$259	0.0%	35%
0.05	0.02	1.0%	45.3%	18	50.6%	2.79	237	\$180	\$265	0.0%	34%
0.08	0.02	1.0%	43.1%	9	50.0%	2.57	213	\$178	\$331	0.2%	44%
0.04	0.02	2.0%	45.1%	26	50.1%	2.64	242	\$177	\$265	0.0%	36%
0.04	0.02	1.0%	46.1%	27	52.1%	2.94	257	\$175	\$228	0.0%	34%
0.03	0.02	1.0%	49.1%	45	51.8%	3.10	317	\$162	\$190	0.0%	35%
0.02	0.02	none	53.4%	83	50.1%	3.23	399	\$148	\$152	0.0%	36%
0.02	0.02	3.0%	53.4%	83	50.1%	3.23	399	\$148	\$152	0.0%	36%
0.02	0.02	1.5%	53.7%	87	51.2%	3.28	426	\$140	\$152	0.0%	37%

Table 11: Gross drift 2 basis points a night, as Table 10.

lots, assess	lots, funded	stop	pass	days to pass	any pay	cash / fee	T , days	G , \$/yr	D	ruin	p^*
no configuration is within the limits											

Table 12: No drift, as Table 10.

lots, assess	lots, funded	stop	pass	days to pass	any pay	cash / fee	T , days	G , \$/yr	D	ruin	p^*
0.08	0.03	1.5%	48.4%	11	54.1%	4.62	128	\$598	\$350	0.1%	18%
0.08	0.03	none	48.4%	11	54.4%	4.60	128	\$598	\$346	0.1%	18%
0.08	0.03	2.0%	48.4%	11	54.4%	4.60	128	\$598	\$346	0.1%	18%
0.08	0.03	3.0%	48.4%	11	54.4%	4.60	128	\$598	\$346	0.1%	18%
0.06	0.03	1.5%	51.8%	15	54.9%	5.00	134	\$581	\$269	0.1%	14%
0.06	0.03	none	51.8%	15	55.0%	4.95	132	\$580	\$271	0.1%	13%
0.06	0.03	2.0%	51.8%	15	55.0%	4.95	132	\$580	\$271	0.1%	13%
0.06	0.03	3.0%	51.8%	15	55.0%	4.95	132	\$580	\$271	0.1%	13%
0.05	0.03	none	53.7%	18	54.7%	5.22	141	\$579	\$265	0.0%	13%
0.05	0.03	2.0%	53.7%	18	54.7%	5.22	141	\$579	\$265	0.0%	13%
0.05	0.03	3.0%	53.7%	18	54.7%	5.22	141	\$579	\$265	0.0%	13%
0.05	0.03	1.5%	53.7%	18	54.5%	5.23	143	\$573	\$265	0.0%	13%
0.04	0.03	1.5%	55.7%	26	54.9%	5.58	162	\$549	\$228	0.0%	13%
0.04	0.03	none	55.7%	26	54.7%	5.52	161	\$549	\$228	0.0%	14%

Table 13: The sample's own drift, 4.5 basis points a night, with the nights left as they were. As Table 10.

Reading Tables 11, 12 and 13. At 2 basis points 45 configurations remain. The payout rate removes the rest: only the smaller funded sizes still pay half the time, so the cash a year is lower and the first cash later. At no drift the limits leave 0, and Table 12 is empty. The plan has no version that is safe against the premium being absent. Table 13 leaves the nights as they were, at the sample's own 4.5 basis points: the same sizes lead, a little higher.

7 The comparison

Table 2 picks the best configuration separately at each drift. That flatters the night, because the trader has to choose a size before knowing the drift. So this section fixes one plan, the best at 4 basis points, and varies the drift under it.

drift, bp	pass	days to pass	any payout	cash / fee	T , days	G , \$/yr	D	ruin	p^*	within limits
0	38.2%	11	26.9%	1.17	239	\$48	\$549	7.1%	none	no
1	40.4%	11	32.6%	1.62	204	\$157	\$494	3.2%	84%	no
2	42.8%	11	38.6%	2.25	177	\$278	\$456	1.4%	47%	no
3	44.8%	11	44.6%	2.98	155	\$395	\$418	0.5%	30%	no
4	46.8%	11	50.3%	3.92	135	\$514	\$380	0.3%	21%	yes
5	48.7%	11	55.6%	4.95	120	\$630	\$342	0.1%	15%	yes
6	50.8%	11	60.6%	6.27	108	\$769	\$304	0.0%	12%	yes

Table 14: One plan held fixed, 0.08 lots in the assessment and 0.03 once funded, its own stop none, as the night's gross drift is varied. Columns as in Table 10.

Reading Table 14. Every column moves one way with the drift. At no drift the plan passes 38.2% of the time, its funded account pays 26.9%, and the bankroll nets \$48 a year: under the bracket's \$148, and outside the limits. At 2 basis points it nets \$278. At 4 it passes 46.8%, pays 50.3% and nets \$514. At 6 it nets \$769. The breakeven probability falls from none to 21%: at the long-run drift a purchase is worth making even if the trader thinks it more likely than not that the firm refuses. This plan is within the limits only from 4 basis points, because below that its funded account pays less than half the time. A trader who expects 2 basis points takes the smaller funded size of Table 11, which is within the limits there and nets \$194 a year.

The breakeven drift. The fixed plan's cash a year equals the bracket's at a gross drift of 0.9 basis points a night. Above it the night pays more. The QQQ history's +5.61 and the sample's +4.55 are both above it. The sample's standard error is 2.62, so the breakeven sits 1.4 standard errors under the sample mean: the sample alone does not exclude a drift at which the bracket wins. Against the QQQ history it sits 4.3 standard errors under the mean. Cash is not the only column. The night's breakeven probability matches the bracket's 50% near 2 basis points, where the fixed plan reads 47%.

The first part of the night alone. Holding only 18:05 to 03:00 has a third less noise, and in this sample most of the mean. If the premium sits there, the rows marked "first part" in Table 2 are what it pays: \$596 a year at the sample's 3.5 basis points. If the premium is spread over the night by the hour, the first part earns about 2 basis points, and pays \$220. Which is true is not known, so the plan holds the whole night.

8 The \$100,000 account

Sections 6 and 7 are on the \$3,000 account. The firm sells the same rulebook on larger account balances, and the largest is \$100,000 for \$560 at the 70% share, or \$756 with the 90% share. Every rule of the account is a fraction of the account balance, so a position at the same leverage walks

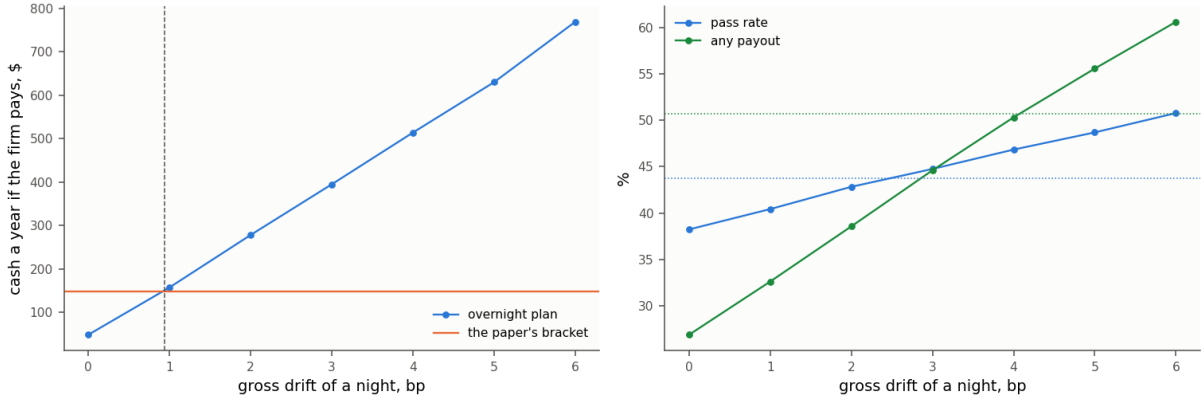


Figure 2: The fixed plan as the drift is varied. Left: cash a year against the bracket's, with the breakeven drift dashed. Right: its pass rate and payout rate, with the bracket's dotted. A night curve under the bracket's line at 4 basis points would mean the premium does not pay for the stop it forces.

the same path at every account size. Two terms are not fractions: the fee and the \$100 minimum payout. Both are fixed in dollars, and both shrink against a larger account balance.

The Cash Rate per Dollar of Account Balance (G/B). Dividing Proposition 2 by the account balance,

$$\frac{G}{B} = \frac{365 (\alpha P E[W] - F/B)}{d (E[n_A] + P E[L_F])}$$

with every symbol as in the proposition. At a fixed leverage P , $E[n_A]$ and $E[L_F]$ do not depend on B , and $E[W]$ depends on it only through the minimum payout. So the account size enters twice. The fee over the account balance F/B is 1.27% at \$3,000 and 0.56% at \$100,000. The minimum payout after the split is 4.8% of a \$3,000 account balance and 0.14% of \$100,000, so a funded account on the larger account can request sooner. Cash a year therefore rises faster than the account balance does.

The run. The 180 configurations of Section 6 are run at the same leverage, the lots times 100,000/3,000, at gross drifts of 0, 2 and 4 basis points, on the same 654 nights and through the same simulator. The bankroll holds the same count of fees, 26.3 of them, which is \$14,737. At each drift the configuration with the most cash a year within the limits is then run once more at \$756 and the 90% share. That is 543 configurations on one seed. The run and the forecast below were committed before any of them was scored.

drift, bp	within	lots, assess	lots, funded	stop	pass	any pay	T , days	D	ruin	p^*	G at 70%	G at 90%	Topstep scenario	1 MNQ, 1 ZN	2 MNQ, 2 ZN
0	9	1.67	0.33	3.0%	38.7%	51.0%	368	\$3,360	0.0%	45%	\$1,808	\$2,257	zero drift	-\$525	-\$1,988
2	52	2.67	0.67	none	43.1%	50.0%	174	\$5,043	0.2%	20%	\$9,411	\$11,971	mean set to 2 bp	\$2,910	\$2,967
4	90	2.67	1.00	none	47.3%	51.2%	134	\$5,591	0.1%	12%	\$20,771	\$26,539	historical	\$6,850	\$9,768

Table 15: The \$100,000 account: at each gross drift, the configuration with the most cash a year within the limits. “Within” counts the configurations of 180 inside the limits. Columns to p^* are at \$560 and the 70% share, as in Table 10. The last three columns are one Topstep \$150,000 account at a time, replaced when it ends, from the companion study of that firm, net dollars a year, under the scenario nearest in drift: its nights average -0.04 , 1.96 and 4.76 basis points after costs.

Reading Table 15. At 2 basis points the best configuration holds 2.67 lots in the assessment, 7.8 times the account balance, and 0.67 once funded. It passes 43.1%, pays at least once 50.0% of the time, and the bankroll nets \$9,411 a year at the 70% share and \$11,971 at 90%, with first cash at a median of 174 days. At 4 basis points the same assessment size with 1.00 lots funded nets

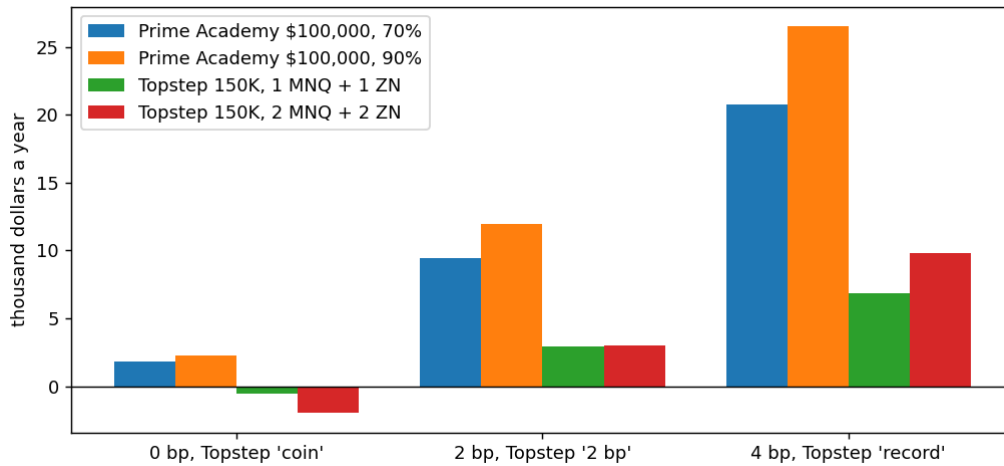


Figure 3: Cash a year from one account after another on the \$100,000 account at the two shares, and from one Topstep \$150,000 account at a time at two sizes, by the night's drift. A Topstep bar above the Prime Academy bars at a drift would say the larger account does not pay more there.

\$20,771 and \$26,539. The same grid on the \$3,000 account pays at most \$205 and \$526 within the limits at those drifts. So 33 times the account balance pays 46 and 39 times the cash, the direction the two fixed terms give.

The night without its premium. On the \$3,000 account no configuration is within the limits at no drift. Here 9 are, and the best nets \$1,808 a year with first cash at a median of 368 days. With no drift and a cost on every night, that income can come only from the rulebook's asymmetry, which the companion paper prices for the random-side bracket. This figure is the largest of 180 on one seed, so it is read as an upper estimate until a second seed is run.

Beside Topstep. At each drift one account after another here nets more than one Topstep account at a time: \$1,808 against -\$525, \$9,411 against \$2,910, and \$20,771 against \$6,850. The comparison is between two firms' rulebooks and not between two measurements of one thing. The Topstep account holds 1 MNQ, 0.4 times its \$150,000, and one 10-year note future at month-end. The position here is 7.8 times the account balance in the assessment, on a dealer's contract.

Written before scoring.

forecast	found
0 bp: \$2,500 to \$6,000 a year at the 70% share, and no configuration within the limits	\$1,808, under the range, and 9 within the limits
2 bp: \$7,000 to \$11,000	\$9,411
4 bp: \$18,000 to \$24,000	\$20,771
the 90% share nets more than the 70% at 2 and 4 bp	\$11,971 and \$26,539, and \$2,257 at 0 bp
more than one Topstep account at a time at every drift	at every drift

What it does not show. Each configuration is 4,000 bankroll paths on one seed, and each row of Table 15 is the largest of 180, which biases it upward. The nights are the same 654 as before, so the larger account adds no evidence that the night is paid. No refused payout, no swap and no dealer's spread at 18:05 or 09:25 is in the model. Whether the firm accepts 2.67 lots long every night at the same two times is not known, and the bankroll's first-year fall is \$5,043 at the 90th percentile at 2 basis points.

9 How the numbers were checked

- *The executor.* Every return comes from a strategy replayed by the framework's broker. The stops the account simulator applies are read off the ledger, and Table 5 shows the two agree on every night.
- *The simulator.* It reproduces the companion paper's configuration (Table 9), and its pass rates follow Proposition 1 in shape (Table 8).
- *The sample.* The schedule is rebuilt from the bars in the notebook and compared with the pinned one.
- *The placebo.* The day on the same mornings (Table 6).
- *The order of work.* The windows, stops, split, scenarios and limits were committed before the replay ran, and none was changed afterwards.

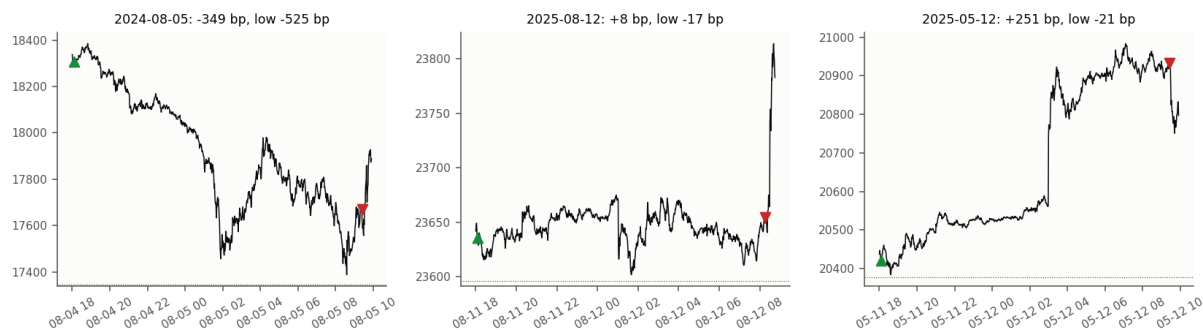


Figure 4: Three nights from the ledger: the worst, the median and the best. Triangles mark the entry and exit fills, the dotted line the lowest price while held.

10 What is assumed and what is open

Read on the platform before the first fee.

1. That a position opened at 18:05 and closed at 09:25 New York is charged no swap. One night on the evaluation account shows it. The position of Section 2 crossed 17:00 and does not.
2. The spread on NDX100 at 18:05 New York and at 09:25.
3. The contract's trading hours, and that 18:05 is after its reopen.
4. Whether the firm's own list of high-impact releases matches the calendar used here.

Assumed.

- The CFD's return between rollovers is the future's. The dealer's quote, not the exchange's, fills the order.
- A stop fills at its price. A release that gaps through a stop fills worse. The plan is flat for USD releases, and not for others.
- The cost per night is 0.65 basis points at every price level.

- The shape of a night does not change with the drift: the scenarios shift every night by the same amount.
- A limit order at the target would remove the overshoot of Section 5. It is not modelled, so the pass rates are a little low.

Open.

- The size of the premium over the next years. The QQQ history supports 4 basis points and cannot exclude less.
- Which hours of the night are paid.
- Whether the firm pays, which no price history contains. The breakeven probability is the paper's only handle on it.
- Whether the firm treats a one-sided trading history as a prohibited pattern.
- A second seed for the \$100,000 account of Section 8, and whether the firm accepts its position.

11 Reproduction

The notebook `prime_overnight.ipynb` holds every number with its working. Its last result cell writes `paper/results.json`; `paper/make_numbers.py` turns that into the macros and tables of this paper. The replay is `core.replay_all()`, and its ledgers are committed under `data/`. The schedule is `modules/manifest.json`. Section 8 is the notebook's Section 20: `core.run_big()` runs it, `core.PREREG_BIG` is its declaration, and the notebook writes `paper/big.json`.