RESEARCH PERSPECTIVE

Late-Game Sensitivity

Why event-contract prices can become most sensitive near resolution, and what that means for a resting quote

In a tied basketball game, a two-point basket moves the win probability by about 7 percentage points at halftime and about 31 with one minute left. The same mathematics governs a reference price near its threshold, and it applies only while the outcome is still in doubt. A quote that was reasonable at halftime can be a liability with two minutes left, so we think quote size and width should depend on the state of the event as well as the clock.

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KEY TAKEAWAYS

01 In a tied, evenly matched basketball game, Stern's scoring model implies that a two-point basket moves the win probability by about 7 percentage points at halftime and about 31 percentage points with one minute left (Exhibit 1).

02 Sensitivity peaks while the outcome is in doubt and collapses once a lead is safe. Distance from the threshold should be measured against the uncertainty that remains, not in points or dollars (Exhibits 2 and 3).

03 A resting quote's risk scales with that sensitivity. Size and width that are reasonable early in an event can be uneconomic late, and averaging windows do not remove that late sensitivity when the outcome is close.

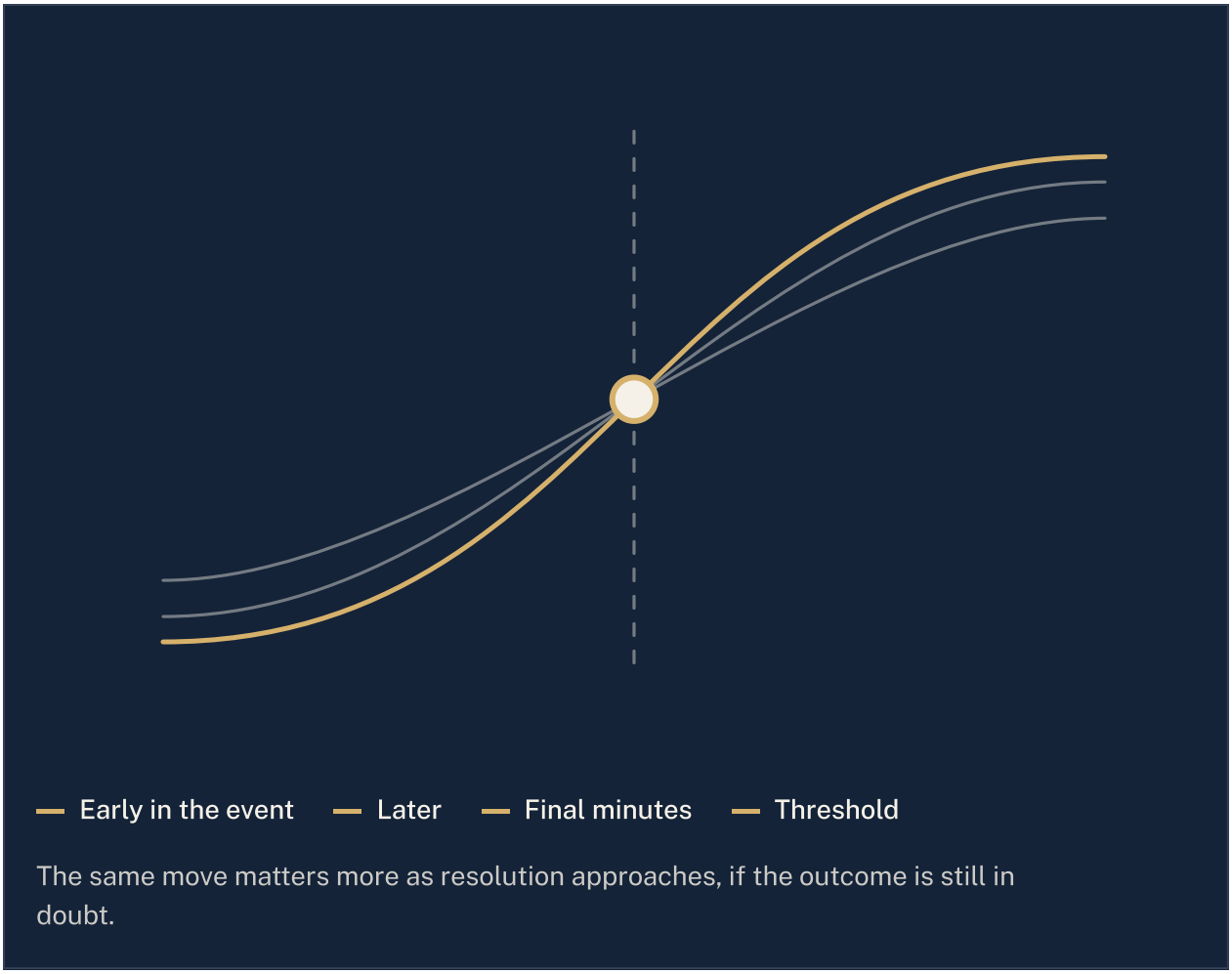
Model analysis. Sports and threshold illustrations are not forecasts or Predict Here Capital results; crypto event contracts remain a future research area.

▼ **Method, sources and limitations**

Study type	Model analysis
Method	Closed-form model illustrations using Stern's (1994) Brownian-motion model of basketball scoring and a standard lognormal threshold model, with parameters stated in each exhibit. No trading data are used.
Data period	Sports parameters from Stern (1994), estimated on 493 NBA games from January to April 1992; threshold illustrations use hypothetical volatility.
Source categories	Peer-reviewed sports statistics and betting-market research; Official resolution documentation
Limitations	The scoring model omits possession, fouls, timeouts and other features that matter most in the final minutes. Threshold illustrations assume a point-in-time fix; averaging windows and other settlement conventions change the shape of sensitivity. Model outputs illustrate a mechanism; they are not forecasts, prices or trading results.

One model for games and thresholds

Many event contracts pay $1 if a running quantity finishes above a line: a score margin above zero, a temperature above a threshold, a reference price above a strike. If the quantity follows a Brownian motion, moving randomly with roughly constant drift and volatility, the probability that it finishes above the line has the same form in every case. It is the normal distribution function evaluated at the current distance to the line divided by the uncertainty still to come, after allowing for any expected drift.



The same move matters more as resolution approaches, if the outcome is still in doubt.

> Probability of finishing above the line = Φ[(current lead + expected drift over the time remaining) ÷ (σ × √(fraction of the event remaining))]
> where Φ is the standard normal distribution function and σ is the standard deviation of the change over the whole event

Stern (1994) fitted this model to 493 NBA games and found that it describes the progress of scores well. The paper estimates a home-court drift of 4.87 points per game and a game-level standard deviation of 15.82 points. Option traders will recognize the structure: a digital option's value has the same form, and its sensitivity to the underlying rises sharply near expiry when the underlying is close to the strike.

The same basket is worth more late in the game

Exhibit 1 applies Stern's estimate of σ to an evenly matched game that is tied, and asks how far one score moves the win probability at different points in the

second half.

EXHIBIT 1

Change in a tied game's win probability from one score

Time remaining	Remaining uncertainty (points, 1 s.d.)	After a 2-point basket	After a 3-pointer
24:00 (halftime)	11.2	+7.1 pts	+10.6 pts
12:00	7.9	+10.0 pts	+14.8 pts
6:00	5.6	+14.0 pts	+20.4 pts
2:00	3.2	+23.2 pts	+32.4 pts
1:00	2.3	+30.9 pts	+40.6 pts
0:30	1.6	+39.2 pts	+46.8 pts

Remaining uncertainty = 15.82 × √(minutes remaining ÷ 48). Changes are in percentage points of win probability from 50%.

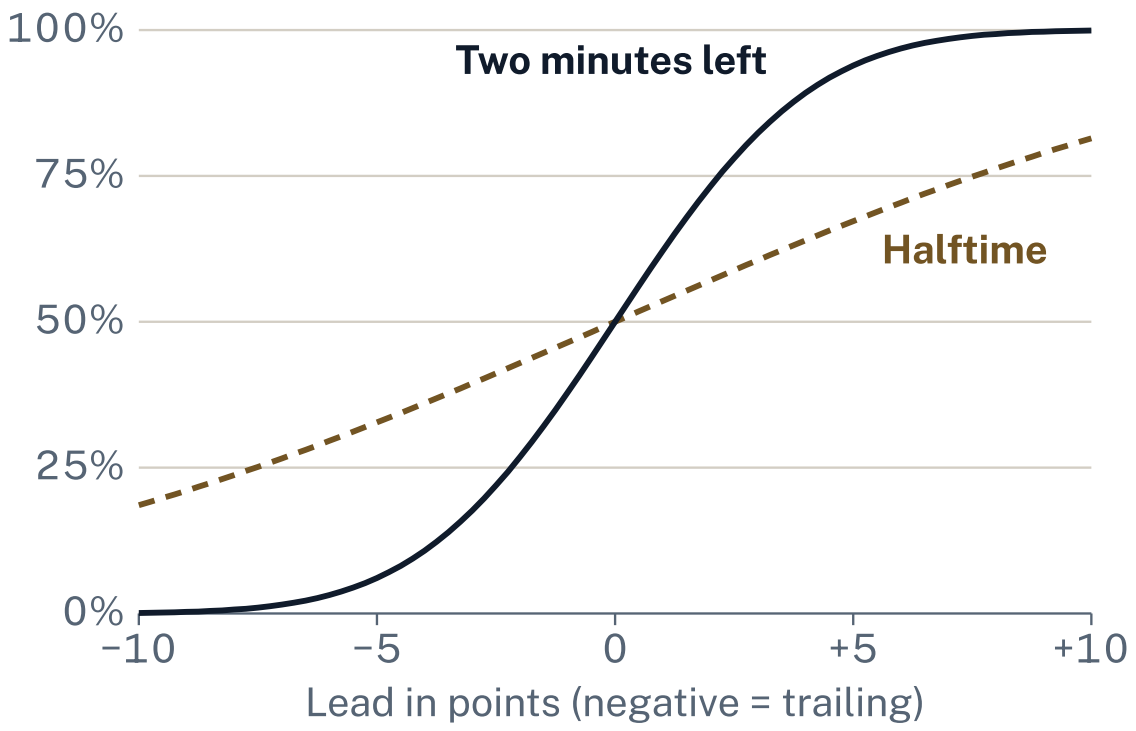
Source: Predict Here Capital calculation using Stern (1994), σ = 15.82 points per game, no drift. Model illustration; Stern notes that the model omits possession, which matters in roughly the last two minutes.

In the model, a two-point basket moves the value of 100 contracts by about $7 at halftime and by about $31 with a minute left. If a resting offer to sell those contracts is filled at the old price just after the basket, the maker has sold roughly that amount below the new model value, less the edge built into the offer. Nothing about the quote has changed. The state of the game has.

Sensitivity is highest while the outcome is in doubt

EXHIBIT 2

Win probability against lead: halftime versus two minutes left



Evenly matched teams (no drift); σ = 15.82 points per game.

Source: Predict Here Capital calculation using Stern (1994). Model illustration, not a forecast.

At halftime the curve is gentle: a six-point lead is worth about 70%. With two minutes left it is nearly a step: the same lead is worth about 97%, and most of the change in win probability occurs within four points of a tie. In the model, a lopsided late game barely moves while a close one swings hardest.

The practical consequence is that distance from the line has to be measured in units of the uncertainty that remains. A six-point lead is a modest edge at halftime and close to decisive with two minutes left.

Price thresholds behave the same way

The same structure governs a contract that pays if a reference price finishes above a threshold. Exhibit 3 uses a lognormal price with hypothetical 60% annualized volatility and asks how much a 0.05% rise in the price raises the probability of finishing above the threshold.

EXHIBIT 3

Effect of a 0.05% price rise on the probability of finishing above a threshold

Time to the fix	Remaining uncertainty (1 s.d.)	Price starts at the threshold	Price starts 0.2% below
60 minutes	0.64%	+3.1 pts	+3.0 pts
15 minutes	0.32%	+6.2 pts	+5.3 pts
5 minutes	0.19%	+10.6 pts	+6.9 pts
1 minute	0.08%	+22.7 pts	+2.7 pts

Starting probabilities: about 50% at the threshold throughout; 38%, 27%, 14% and under 1% when 0.2% below.

Source: Predict Here Capital calculation. Lognormal price, 60% annualized volatility, point-in-time fix, no drift. Hypothetical parameters; not a forecast of any market.

Starting exactly at the threshold, sensitivity to a small move rises steadily toward the fix. Starting 0.2% away, it rises and then falls: with a minute left, 0.2% is more than two remaining standard deviations, so the contract is nearly decided and a small move barely matters. That is the late-game cliff of Exhibit 2, viewed from the side.

Settlement conventions change the arithmetic, not the conclusion

Some contracts settle on an average over a window rather than at a single instant. Polymarket US documentation describes crypto contracts that can settle on the average of a named index over the final minute, and Polymarket International's up/down markets compare Chainlink time-weighted averages at the start and end.

Once an averaging window opens, part of the average is already fixed, and each further price move shifts it only in proportion to the share of the window still to run. But the uncertainty left in the average shrinks even faster, so if the observed portion leaves the outcome close to the threshold, the payout probability can still swing sharply near the end. Pricing has to track both the observed part of the average and the uncertainty that remains.

Weather contracts add rounding and reporting conventions, and sports contracts add overtime, possession and official review. The model describes the shape of the problem, and the contract defines it.

What it means for a resting quote

We draw three consequences. First, quote size and width should be functions of the event's state, meaning score, time and distance to the threshold, and not of the clock alone. Second, the cost of latency varies. In a close game, a cancellation that takes the same time at halftime and in the final minute faces very different risks, because the jump it must outrun is larger late in the game. Third, the most dangerous moments are also those in which a resting quote is most likely to be selected by participants who have just seen the news.

The evidence is consistent with that picture. Betting prices absorb goal news swiftly and fully (Croxson and Reade, 2014). Late prices can also be biased: in an earlier prediction market, trailing teams were priced too high in the closing minutes (Page, 2012).

We hold these as hypotheses to test, and none of them describes a control we have implemented. A credible test would compare quoting policies by event state, at comparable capital and risk, using the timestamps a live system would actually have had.

What would change this view

We would weaken this rationale for state-dependent quoting if measured adverse selection on fills did not rise with model sensitivity, for example because venue controls or other liquidity providers absorb late news first. And if the model's omissions, such as possession in the closing minutes, mattered more than the effects it captures, we would need a richer in-game model before drawing any conclusion about quoting.

Sources and further reading

Sources reviewed October 27, 2026. Venue rules, fees and programs change; the specific contract and account terms govern. Views are the author's as of the edition date shown above.

1. Stern, H. (1994). A Brownian motion model for the progress of sports scores. Journal of the American Statistical Association 89(427).
2. Croxson, K. and J. J. Reade (2014). Information and efficiency: goal arrival in soccer betting. Economic Journal 124(575).
3. Page, L. (2012). "It ain't over till it's over": Yogi Berra bias on prediction markets. Applied Economics 44(1).
4. Polymarket US Market Resolution. Polymarket US documentation.
5. Polymarket resolution. Polymarket documentation.