Does the term premium pay for the duration?

Evidence from Polish sovereigns.

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Motivation

EX-ANTE PREMIA VERSUS REALISED ATTRIBUTION

- On the Polish curve the ex-ante term premium is positive on average: roughly +105 bp at the 10-year tenor under ACM with the BRW small-sample bias correction, and positive on the large majority of days. The textbook implication is that a duration position over rolling short-term cash earns this premium.
- The empirical question is the realised counterpart: of the 4.14% compound annual return the published TBSP index delivered over nineteen years, what share is attributable to term-premium realisation, and what share to coupon accrual, reinvestment and roll-down?
- The benchmark cash rate throughout is the NBP reference rate, a proxy for the upper envelope of retail deposit rates.

A seven-component identity for the quarterly index return

DECOMPOSITION

Each quarter's TBSP log-return is partitioned in closed form:

$$r_t = \underbrace{CC_t + RP_t + RD_t}_{\text{CarryRoll}} + \underbrace{ERC_t + TPC_t}_{\text{CurveMove}} + Cnvx_t + Res_t$$

- *CC* coupon accrual, *RP* reinvestment proceeds, *RD* clean-price roll-down along an unchanged curve.
- *ERC* and *TPC*: revaluation from the two legs of the fitted-curve decomposition $y_t(\tau) = y_t^{rf}(\tau) + tp_t(\tau)$ (ACM–BRW on the LW-NSS zero curve), each revalued separately.
- *Cnvx* second-order convexity; *Res* the closure residual. The sum reproduces the published index by construction; no estimation enters the partition.

Data and replication quality

THE PANEL

- Published Treasury BondSpot Poland (TBSP) index, 2006-12-29 to 2026-05-15, 80 quarter-end snapshots, replicated bond by bond on an 89-bond BondSpot panel with daily LW-NSS zero curves.
- Closure residual: +20 bp cumulative over the full sample. Tracking gap against the published index: -106 bp cumulative (-5.4 bp per year). Both are an order of magnitude below the components being attributed.

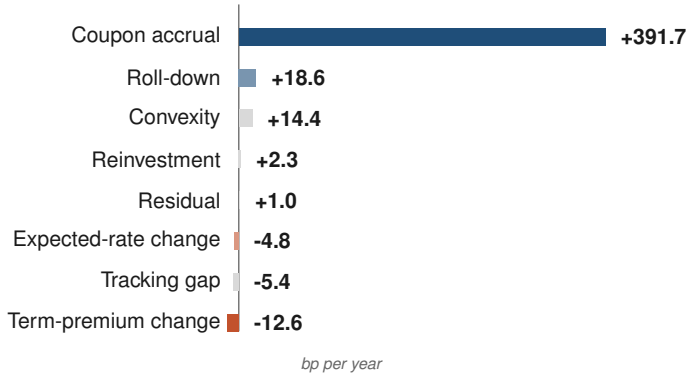
Result 1: the carry-and-roll bloc

CUMULATIVE ATTRIBUTION, 2006-12-29 TO 2026-05-15

- CarryRoll (*CC* + *RP* + *RD*) cumulates to +8,010 bp, +413 bp per year of sample, against the +7,866 bp (+405 bp per year) delivered by the published index.
- Within the bloc, coupon accrual contributes +7,604.9 bp, roll-down +361.4 bp and reinvestment +43.7 bp: the income bloc alone accounts for essentially the entire realised return.
- Convexity adds a further +278.8 bp (+14.4 per year), a second-order but persistent positive term.

The full attribution, per year of sample

CUMULATIVE CONTRIBUTION / SAMPLE LENGTH



Components sum to the published TBSP log-return, +405 bp per year.

Result 2: full-sample inference on the curve-move bloc

HAC TESTS AND BOOTSTRAP INTERVALS

- *ERC* + *TPC* cumulates to -337 bp over the sample (-17 bp per year), largely the unreversed 2022 revaluation.
- The full-sample tests are uninformative: the mean realised *TPC* of -3.1 bp per quarter has HAC $p = 0.83$, with a bootstrap confidence interval on the cumulative of [$-2{,}534$, $+1{,}776$] bp; the TBSP-versus-cash excess of $+17.6$ bp per quarter has $p = 0.55$. Both intervals bracket zero.
- The tests: with $e_t = r_t^{TBSP} - r_t^{cash}$ the null $H_0 : \mathbb{E}[e_t] = 0$ is assessed by $t = \bar{e} \,/\, \sqrt{\widehat{V}_{NW}/T}$ and by bootstrap intervals on cumulative sums, likewise for *TPC*. The interval width reflects the concentration of variance in a single regime episode.

The 2021Q4–2022Q3 tightening episode

ONE EPISODE DOMINATES THE SAMPLE MOMENTS

- Four quarters contribute -962 bp of cumulative term-premium change: four times the full sample's net -245 bp.
- The index fell from 2,175 to 1,703 peak-to-trough, a -21.7% drawdown, only partially reversed after 2023.
- Treating these quarters as part of a homogeneous sample conflates a rare regime realisation with the unconditional distribution; the paper conditions on the episode explicitly; dummy-variable specifications are reported as robustness.

Result 3: the conditional excess return

EXCLUDING THE FOUR EPISODE QUARTERS

- On the 74-quarter sub-sample the mean TBSP-versus-rolling-cash excess is +46.5 bp per quarter, HAC $p = 0.003$, with a cumulative bootstrap confidence interval of [+1,217, +5,534] bp.
- The full-sample counterpart is +17.6 bp per quarter (+1,354 bp cumulative), $p = 0.55$: the four episode quarters move the point estimate by a factor of 2.6 and inflate the variance enough to remove significance.
- The excess over cash is positive on 74 of the 78 quarter-ends of the full sample.

Interpretation

RECONCILING EX-ANTE AND REALISED PREMIA

- A positive ex-ante term premium coexists with a realised term-premium contribution indistinguishable from zero because realisation risk is concentrated in rare, persistent regime episodes; unconditional sample means therefore converge slowly.
- A TBSP-tracking exposure is characterised as a carry position between the term spread and the policy rate bearing low-frequency regime risk; the ex-ante premium is realised only conditionally on the regime path.
- The characterisation reproduces the observed moments: the long-run excess over cash, the modest trailing information ratio (0.21), and the depth of the 2022 drawdown.

Data and econometrics

SPECIFICATION SUMMARY

- **Identity.** Closed-form seven-component partition of the quarterly log-return of a coupon-bearing bond, aggregated with published TBSP weights; derivation and closure properties in the paper's appendix.
- **Curves.** Daily LW-NSS zero curves; expected-rate and term-premium legs from ACM with the BRW small-sample bias correction.
- **Inference.** Newey–West (HAC) tests on quarterly means and bootstrap confidence intervals on cumulative contributions; the regime episode is handled by explicit conditioning.
- **Verification.** The closure residual and the tracking gap against the published index are reported explicitly: +20 bp and −106 bp cumulative respectively.

Companion data and replication

YIELDCARTOGRAPHY.COM

- The identity runs on each quarter as it closes: index-level cards and a per-bond explorer at `yieldcartography.com/total-return`.
- The ACM–BRW expected-rate and term-premium legs update daily on `/term-premia/`; the current quarter-to-date decomposition is carried on the cockpit.
- Underlying CSVs are downloadable from the dashboards.

Thank you.

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yieldcartography.com/slides/duration/