Analysis of Pendle PT Mispricing Near Maturity

Nicola Bernini

November 18, 2025

1 Overview

This mini-paper summarizes insights from two analyses focusing on Pendle PT tokens approaching maturity. The first analysis concerns PT-sUSDe-27Sep2025 while the second concerns PT-sUSDe-Mar2025 in their last 48h of lifetime. Data has been taken from Pendle's API.

2 Key Findings

2.1 1. PT Price Behaviour Near Maturity

Across both cases, PT prices deviate from the textbook "PT $\to$ 1" convergence. Instead, prices tend to hover a few tens of basis points away from par as maturity approaches. In the PT-sUSDe-Mar2025 data, PT trades mostly in the 0.996–0.998 range for the observed window close to maturity, while the PT-sUSDe-27Sep2025 case (reconstructed qualitatively from the earlier analysis) displays sharper mispricing spikes.

Plausible drivers of this behaviour include:

- Residual AMM curvature and oracle constraints which make exact convergence to 1 economically unattractive for marginal arbitrage.
- LP exits that create temporary order flow imbalances.
- Asymmetric YT vs PT demand: buying yield (YT) can mechanically push PT down on the Pendle curve.

2.2 2. LP Exit Dynamics

In both discussions, a recurring pattern emerges: LP withdrawals tend to line up with PT dislocations. The mechanism is:

1. LPs unwind positions by withdrawing liquidity or by selling PT+YT back into the AMM.
2. This adds net PT sell pressure into a market where remaining yield is small and the curve is steep.
3. Even modest nominal trades translate into visible price moves in PT space (basis points matter because the carry remaining to maturity is tiny).

2.3 3. Arbitrage Motifs

The analyses identified a few robust arbitrage motifs around these dislocations:

1. Buy underpriced PT when it trades below a reasonable notion of fair value (e.g. below discounted par given remaining yield).
2. Optionally route PT $\to$ YT on the AMM if the curve makes YT temporarily expensive, realising an implicit carry trade.
3. Hold to maturity or unwind once PT retraces, monetising the spread created by LP exits and flow imbalances.

2.4 4. Comparison Between the Two Cases

- **PT-sUSDe-27Sep2025:** Closer-to-maturity regime with sharper, more discrete mispricing episodes, typically aligned with large LP flow events. The behaviour is best thought of as *spiky* around par.
- **PT-sUSDe-Mar2025:** Slightly earlier in the life of the PT and with larger, more stable TVL. The path is smoother; mispricings are smaller in magnitude but still present and clearly visible when plotted at sufficient resolution.

In both cases, the mispricing appears structural rather than a sign of solvency concerns: it is a side-effect of microstructure, liquidity and the specific design of the Pendle AMM and PT/YT decomposition.

3 Data and Plots

3.1 PT-sUSDe-Mar2025 On-chain Data

Figures 1–4 are generated directly from the JSON dataset `pt_susde_mar2025_processed.json` and illustrate PT price, LP price, TVL and trading volume over the observation window.

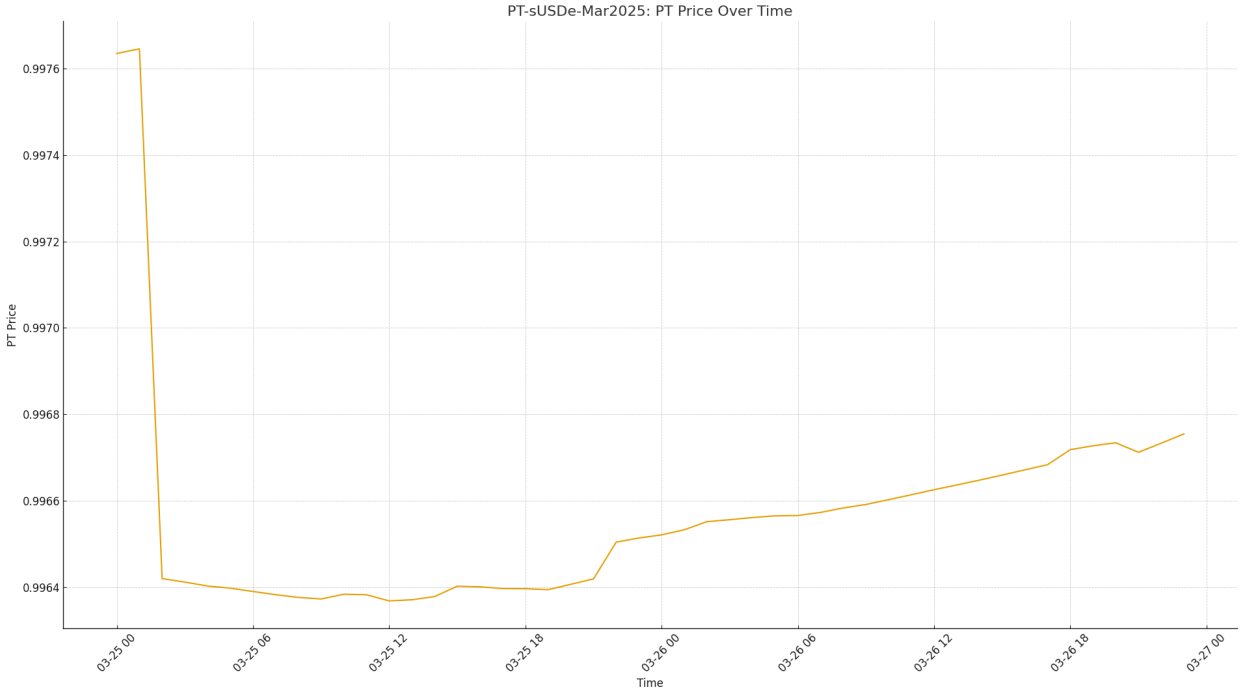

Figure 1: PT-sUSDe-Mar2025: PT price over time in the observation window close to maturity. Prices fluctuate in a tight band below par instead of converging exactly to 1.

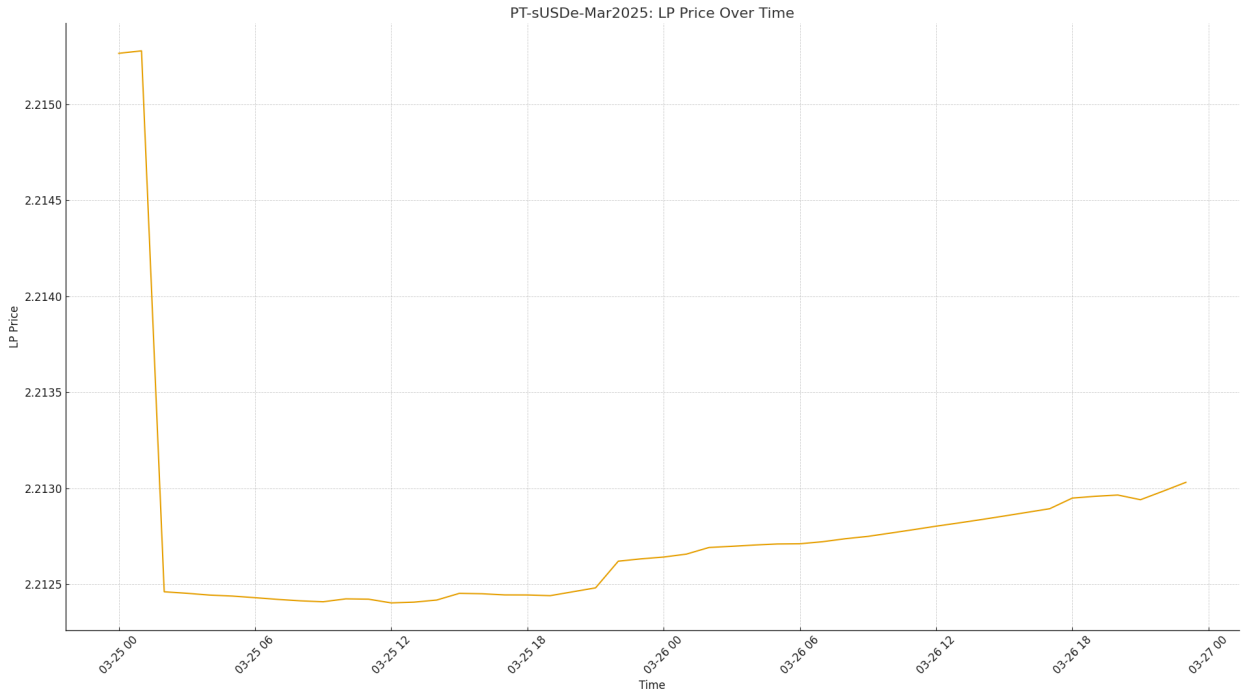

Figure 2: PT-sUSDe-Mar2025: LP token price over time. The LP price embeds both PT and YT legs plus fee flows.

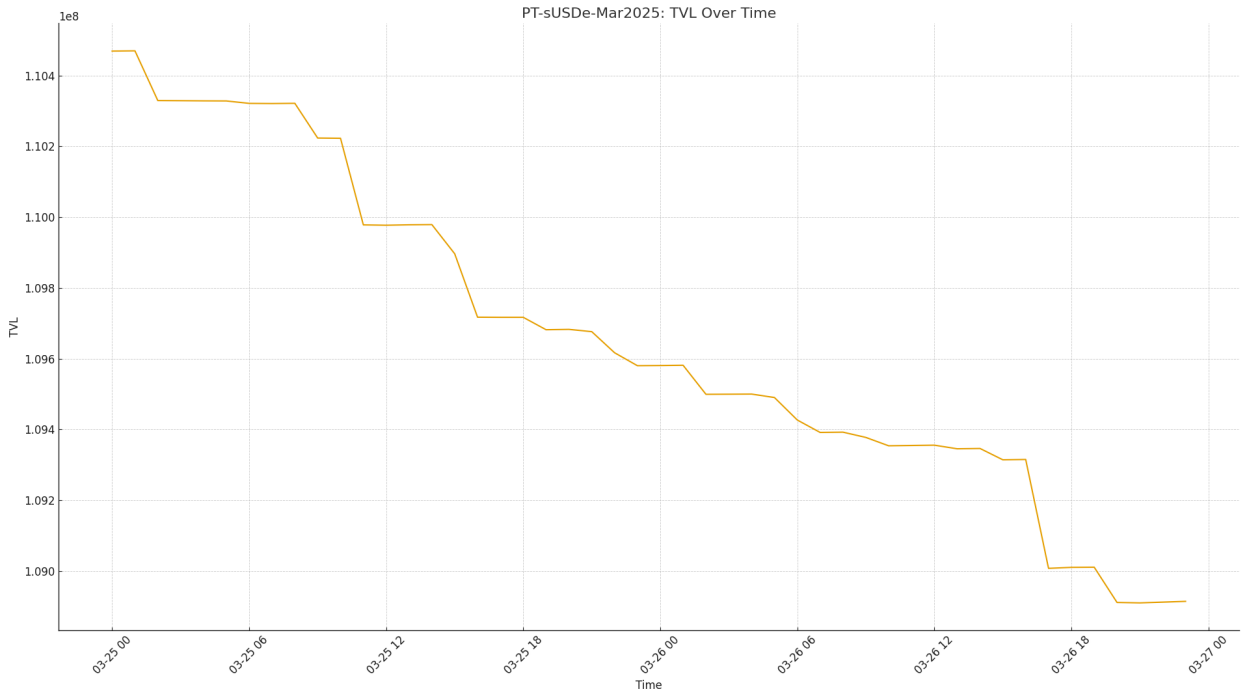

Figure 3: PT-sUSDe-Mar2025: pool TVL over time. Slow drift and occasional steps correspond to net LP flow events.

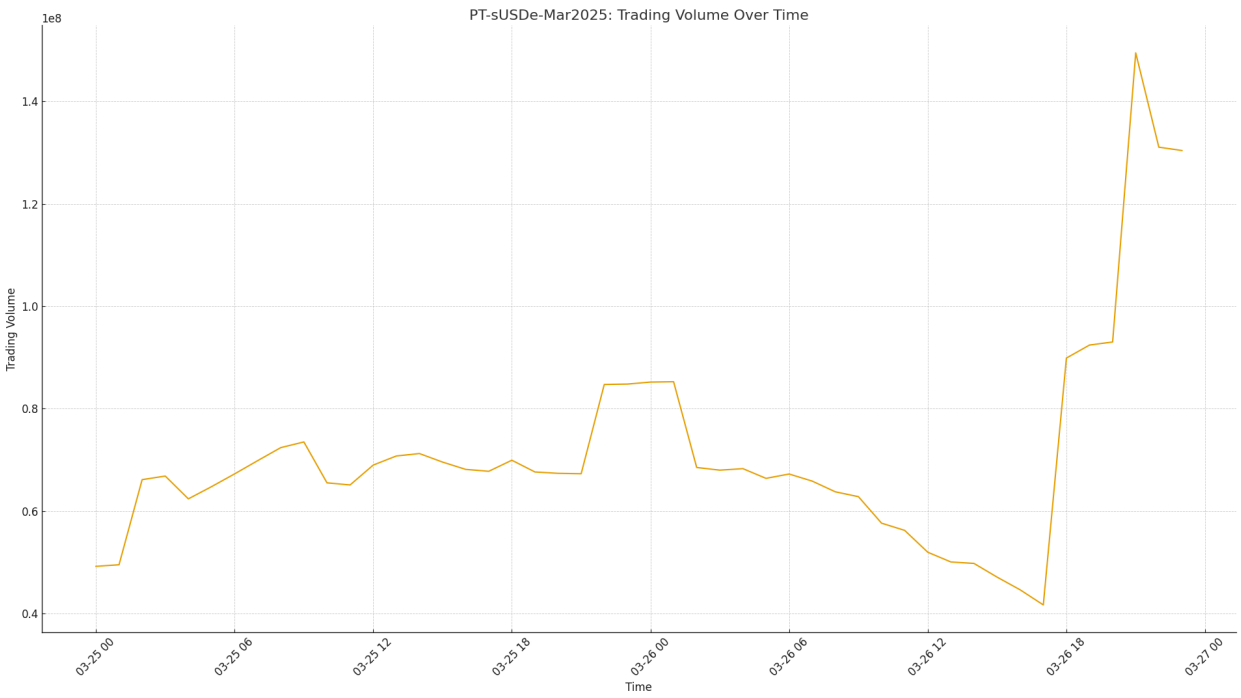

Figure 4: PT-sUSDe-Mar2025: trading volume over time. Local bursts of activity often coincide with small PT price dislocations.

3.2 PT-sUSDe-27Sep2025: Schematic Behaviour

For PT-sUSDe-27Sep2025, the earlier chat analysis was based on direct inspection of market data but did not persist the raw time series as a file in this project. Figure 5 therefore provides a *schematic* reconstruction of the qualitative behaviour discussed: PT trades below par, drifts upwards as maturity approaches, and exhibits a pronounced temporary dip aligned with a large LP exit.

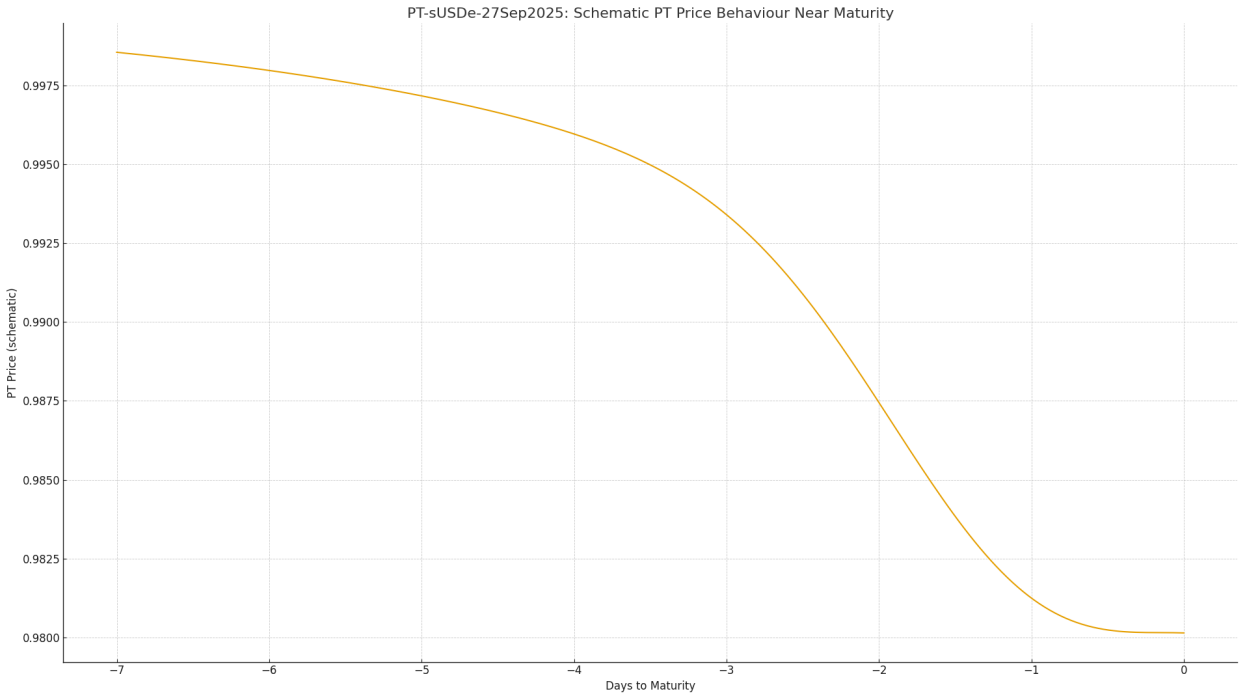

Figure 5: Schematic PT path for PT-sUSDe-27Sep2025 as a function of days to maturity (0 = maturity). The curve captures the qualitative pattern discussed in the analysis: sub-par trading, slow convergence, and a sharp temporary dislocation linked to LP flows. This is an illustrative reconstruction rather than raw tick data.

4 Conclusion

Both PTs demonstrate structural mispricing near maturity driven primarily by liquidity and microstructure rather than fundamental credit risk. In practice, this means:

- There are repeatable arbitrage windows around LP exits and flow imbalances.
- "PT $\to$ 1" should be interpreted as a *tendency* in the absence of frictions, not as a hard boundary enforced by markets.
- Protocols using PTs as collateral or building fixed-income stacks on top of them should explicitly model these microstructure effects, rather than assuming perfect convergence.