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# Rock'n Roll-Down: PnL & arbitrages when rolling interpolated forward curves

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## Abstract

We present a new approach to forward curve interpolation. Our main contribution is to link interpolation methods and PnL through the formulation of a roll-down equation. This equation drives hedged portfolios whenever liquid forwards have sliding expiry dates as time goes by. We solve it analytically and ensure native fitting of liquid pillars. The resolution underlies forward curve construction with a dynamic model on spot drift which provides interesting physical interpretation. As opposed to usual linear or spline interpolations, it proves to be fully arbitrage free, while preserving mathematical tractability. We produce historical PnL generated on typical rate curves and exhibit material improvement compared to standard methods. Overall, our goal is to raise awareness on limitations of traditional interpolations, and to deepen the understanding of roll-down phenomenon.

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