

A Bootstrapped SONIA Curve – Extending the credit-risky curve framework to GBP

BTRM Working Paper Series #29

Nicolò Lavaroni
Analyst, BA Labs

Tommaso Donda
Analyst, BA Labs

Jan Delegos, CFA
Head of Risk, Sky Frontier Foundation

September 2026

The views expressed in this paper are personal to the author and in no way represent the official position or views of any organisation that they are associated with in a professional capacity.

A Bootstrapped SONIA Curve

Extending the credit-risky curve framework to GBP

Nicolò Lavaroni¹ Tommaso Donda¹ Jan Delegos, CFA²

¹ Analyst, BA Labs ² Head of Risk, Sky Frontier Foundation

Working paper, SOFR paper addendum. Data as at 08.09.2026

Abstract

This note applies the construction of our preceding paper on a [bootstrapped USD SOFR curve](#) with credit-risky spread add-on to GBP. The methodology used is unchanged and so is not repeated here. What is worth noting is that data behaviour differs from the US dollar data, given that the Bank of England's published OIS curve (the obvious candidate for the long end), sits about five and a half basis points above where sterling swaps actually trade. We then add a credit-risky layer. As of writing this paper, no free source publishes sterling option-adjusted spreads by credit rating, so we measure spreads directly from sterling corporate bond prices, fitting rating curves and a sector adjustment against the SONIA curve itself. Our approach has several clear applications for market practitioners; including bank liquidity book and bond investors' use for relative value analysis and decision-making.

Keywords: *SONIA; yield-curve bootstrapping; overnight-indexed swaps; clearing settlement prices; trade repository data; day-count conventions.*

1. Construction

The goal of this Addendum is estimating the risk-free floor for GBP exposures. The bootstrap, the interpolation, the no-arbitrage test and the requirement that every input reprice exactly are as described in our previous paper and so not restated. What differs here is the data.

Three segments cover the curve. Realised SONIA fixings from the Bank of England anchor the front end. Up to one-year, par rates implied by the Bank's short-end OIS curve fill the gap. From one-year to 30-year, par swap rates are obtained from Eurex clearing settlement prices (available directly or through various swap data vendors; we used the one cited in the sources). GBP-specific market conventions traditionally differ from the dollar markets: SONIA swaps accrue using ACT/365F basis instead of ACT/360 [8], settle same day rather than at T+2, carry a zero payment lag rather than two business days, and follow the London calendar.

2. Where the SONIA curve differs from the SOFR bootstrap curve

Due to market infrastructure, free access data availability and other reasons our SONIA curve construction approach differs in certain detailed aspects from that used for our SOFR curve:

- There is no futures strip. ICE lists no one-month SONIA contract, only the quarterly three-month one, so the dense front-end grid the dollar curve takes from futures has no sterling counterpart. The delayed feed for the quarterly contracts has since stopped being reachable, and we did not substitute the last prices held: they carry no date, and splicing a stale front end onto a fresh curve is worse than having none, because nothing downstream can detect it.
- The long end comes from clearing settlements rather than broker quotes. Since the construction is end-of-day throughout, this costs nothing in timeliness and gains something in quality: settlement marks-to-market carry real margin calls, and are struck consistently across every tenor each day. They also reach 30 years, where the US dollar curve stops at ten.

- Quoting conventions differ. Dollar zeros are quoted on ACT/360 and sterling on ACT/365F. Without adjusting the data for the same convention and using the published numbers to compare the rates, overstates the swap basis by about five and three-quarter basis points at current levels. The same is true for par rates (and in general for any rates with differing day count conventions). Both must be restated using the same day count first.

As an example, let's take a 1 million GBP notional receivable, using Act/365 convention, maturing in 1 year. With a coupon of 3.65% per annum paid in arrears, once a year, our expected amount receivable would be:

$$1,000,000.00 \text{ GBP} * 3.65\% * 365 \text{ days} / 365 = 36,500.00 \text{ GBP}$$

Solving it backwards, we can calculate the rate if we receive 36,500.00 GBP on a 1,000,000.00 GBP notional, using Act/360 convention:

$$1,000,000.00 \text{ GBP} * X * 365 \text{ days} / 360 = 36,500.00 \text{ GBP} \rightarrow X = 3.60\%$$

As we can see, the change in day-count conventions from Act/365 to Act/360 requires that our nominal rate to also change, for the GBP amount receivables to be equal.

3. Results and validation

Scored against executed trades reported the same day (the date is noted above), the swap inputs differ by 1.7 basis points on average across eight tenors, of which roughly half a basis point is the two-decimal rounding of the published settlements (see Table 1).

Tenor	SONIA zero rate
1M	3.79%
3M	3.80%
6M	3.93%
1Y	4.16%
2Y	4.31%
3Y	4.35%
5Y	4.40%
10Y	4.64%
20Y	5.07%
30Y	5.11%

Table 1. SONIA continuous-compounded zero rates.

The curve rises steadily, sharply through the first two years and then more gently, flattening beyond twenty where the twenty-five and thirty-year settlements are quoted at the same level. Set beside the dollar curve on a common ACT/365F basis, sterling is marginally through the dollar at one year and above it from two years out, widening to roughly 25 basis points at ten years (see Figure 1).

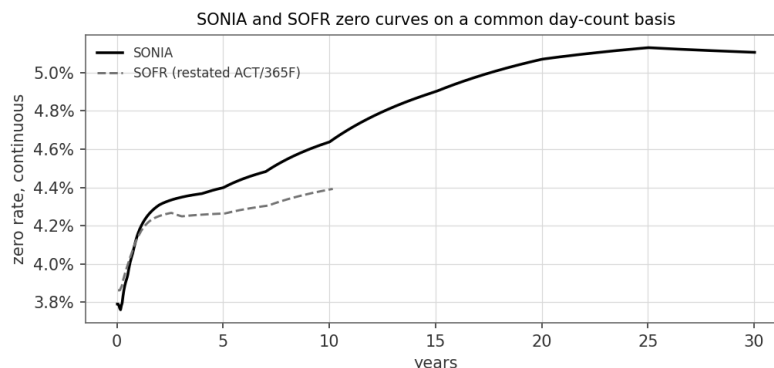


Figure 1. SONIA and SOFR zero curves restated on a common ACT/365F basis.

4. Adding the credit-spread layer

Of course, the risk-free curve is only the floor. Pricing a GBP term deal needs what a rated credit-risky borrower pays over it, which in the SOFR paper came from ICE BofA index option-adjusted spreads published on FRED. However, no sterling equivalent exists: FRED carries 192 ICE BofA series, of which 124 are emerging market, 60 US and eight euro, and none sterling. The Bank of England publishes no corporate series either. Therefore, the spread has to be measured from market data.

For each sterling corporate bond we compute the Z-spread over the SONIA curve, the constant z that reprices the bond when added to the curve:

$$price = \sum_i CF_i \cdot \exp(- (s(t_i) + z) \cdot t_i)$$

Every cash flow is discounted on its own point of the curve, so z is the parallel shift over SONIA that the market charges for that bond's credit. Because the discount curve is the SONIA curve itself, z is already a spread over SONIA: there is no gilt leg and no gilt-to-SONIA basis conversion, a step the dollar construction requires (and which increases the margin of error).

The reader will note that, for simplicity of the calculations, we are removing the callable bonds from our data set. This is a significant trade-off, as we're losing about 40% of the data. Yet, a callable bond's Z-spread is adjusted by the embedded option premium. Computing such a premium, and stripping that out, requires a volatility surface that we do not have access to. This absence does not necessarily reduce the utility of our approach for many investors.

The remaining sample consists of 265 bonds. We fit one curve per rating group, $s(T) = a + b \cdot \ln(T)$, with a Huber loss so a single distressed name cannot drag the fit and intervals bootstrapped by resampling bonds. Sector enters the same fit, so the effects sum to zero: the rating curve is then sector-neutral and the sector term a pure adjustment around it. Residual dispersion is 13.7 basis points.

Years	AAA-AA	A	B
1	-	44	52
2	63	68	80
3	72	82	96
5	83	99	116
7	91	111	130
10	99	123	144
15	107	137	160
20	114	147	171
25	119	154	180
30	-	161	187

Table 2. Sterling credit spread over SONIA by rating, sector-neutral (in basis points).

Sector	Adjustment
Transportation	-25
Consumer Products & Retail	-19
Technology, Media & Telecom	-8
Utilities & Power	+3
Banks	+5
Automotive	+10
Real Estate / Construction	+16
Specialised Finance	+21

Table 3. Sector adjustment, added to the curve above (in basis points).

Results are shown at Figures 2, 3, 4.

We observe that a BBB borrower at seven years tenor therefore sits at 130 basis points over SONIA before sector, 104 in transportation and 151 in specialised finance.

One filter we tested was restricting to UK-domiciled issuers-only. Though, controlling for rating and maturity, the domicile effect is two to three basis points, meaning it is not priced in the yields. High yield is not fitted, due to nine bonds surviving, with seven being water and power utilities, including a CCC-rated name in well-publicised distress.

Set against the dollar at the same rating, sterling and dollar credit spreads are close to identical: within twenty basis points at two years and converging towards zero by ten. Almost the entire difference in all-in borrowing cost between the two currencies is the risk-free curve, not the credit-spread. The comparison stops at ten years, where the dollar curve ends.

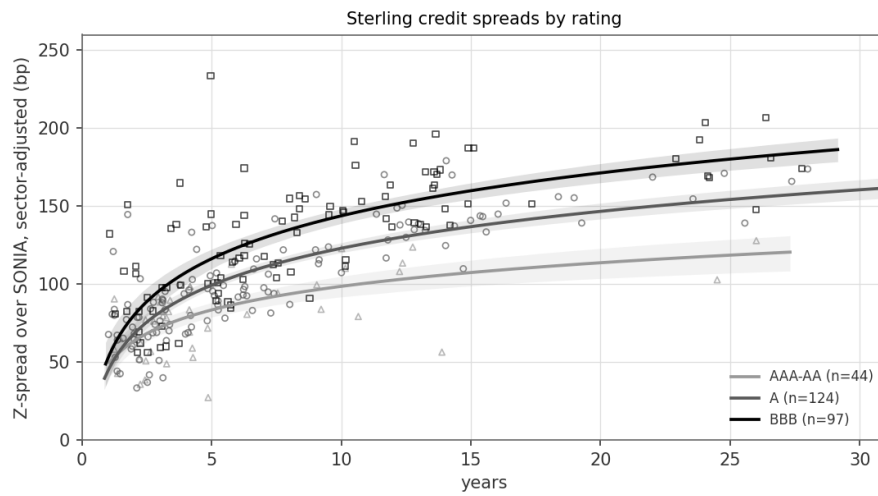


Figure 2. Sterling credit spreads by rating. Points are individual bonds with the sector effect removed; shading is the 80 per cent bootstrap interval.

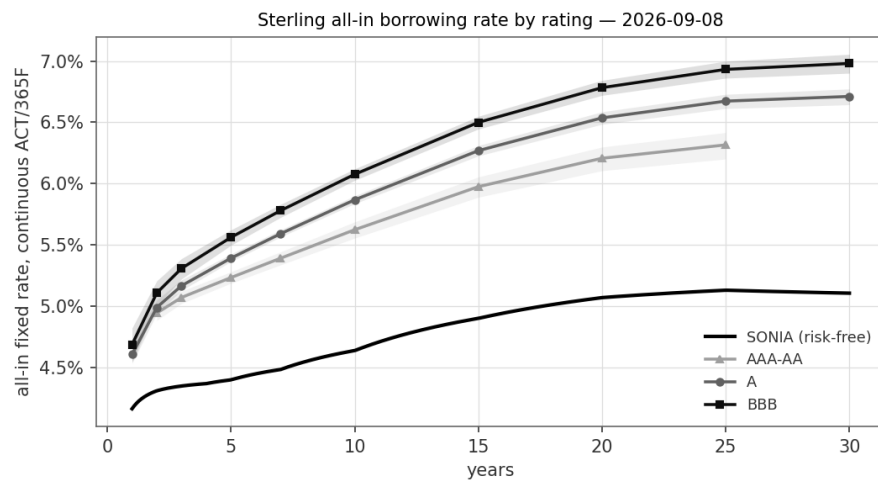


Figure 3. Sterling all-in fixed borrowing rate by rating, SONIA curve plus credit spread.

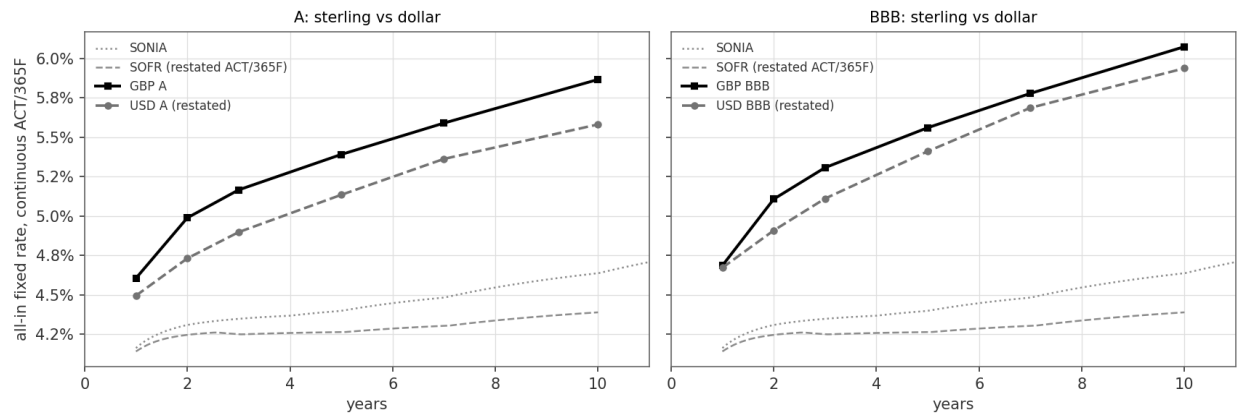


Figure 4. Final credit-risky curves for A and BBB ratings buckets, compared against SOFR and SONIA.

5. Usage under known limitations

From a practical applications standpoint, we note the following:

- There is no futures segment at present, so the first two and a half years rest on swap quotes and the Bank of England's short end; and not on traded futures.
- Settlements are rounded to two decimals, a floor of about half a basis point on precision, and come from a small third party with no service commitment. Their own published discount factors are computed as though a par rate were a zero rate, but we take only the rates and bootstrap these ourselves.
- Pillars beyond ten years are sparse, at 15, 20, 25 and 30 years, so the forward curve is coarse at these tenors and no fine structure should be read into it. (For bank liquidity books, which typically are concentrated at the 3-month to 5-year tenor, this is not necessarily any limitation).
- Credit spreads are Z-spreads, not option-adjusted. Callable issues are excluded due to missing volatility surfaces, which biases the sample slightly tighter since callable bonds generally trade wider.
- The rating groups do not separate at the short end: at two years, AAA–AA to A is five basis points and A to BBB twelve, with overlapping intervals. They separate significantly from about five years out. This result is expected.
- There is no sterling high-yield curve in the data.
- Bond prices come from a single free provider with no service commitment, as do the swap settlements.

Within these limitations the curve provides a risk-free discounting basis for sterling term exposures, and with the credit layer, an indicative all-in cost by rating. Valuing gilts against it would additionally require the gilt-to-OIS basis, which is material and not modelled here. That all said, our approach may be used with care to determine relative value of credit-risky GBP bonds, and sufficiency of their spread over the risk-free curve.

References

- [1] Ballabio, L. *Curve bootstrapping*. The QuantLib Guide.
- [2] Ametrano, F. M., and Bianchetti, M. (2013). *Everything You Always Wanted to Know About Multiple Interest Rate Curve Bootstrapping but Were Afraid to Ask*. Working paper.
- [3] Bank of England. *SONIA benchmark (series IUDSOIA) and Yield curves: OIS daily data*. <https://www.bankofengland.co.uk/statistics/yield-curves>
- [4] DTCC Data Repository (U.S.) LLC. *Public price dissemination, interest rates*. <https://pddata.dtcc.com>
- [5] Eurex Clearing end-of-day settlement prices for OTC interest rate derivatives, accessed via checkmyswap.com. <https://www.checkmyswap.com>
- [6] Bondscovery. Sterling corporate bond curve data. <https://bondscovery.com>
- [7] Federal Reserve Bank of St. Louis. FRED: ICE BofA option-adjusted spread series. <https://fred.stlouisfed.org>
- [8] Bank of England. *Statement on behalf of the Working Group on Sterling Risk-Free Reference Rates*, 20 February 2020 <https://www.bankofengland.co.uk/-/media/boe/files/markets/benchmarks/rfr/statement-working-group-srfr-swaption-caps-floor.pdf>
- [9] Choudhry, M., *Relative value analysis: calculating bond spreads*, www.yieldcurve.com, January 2006