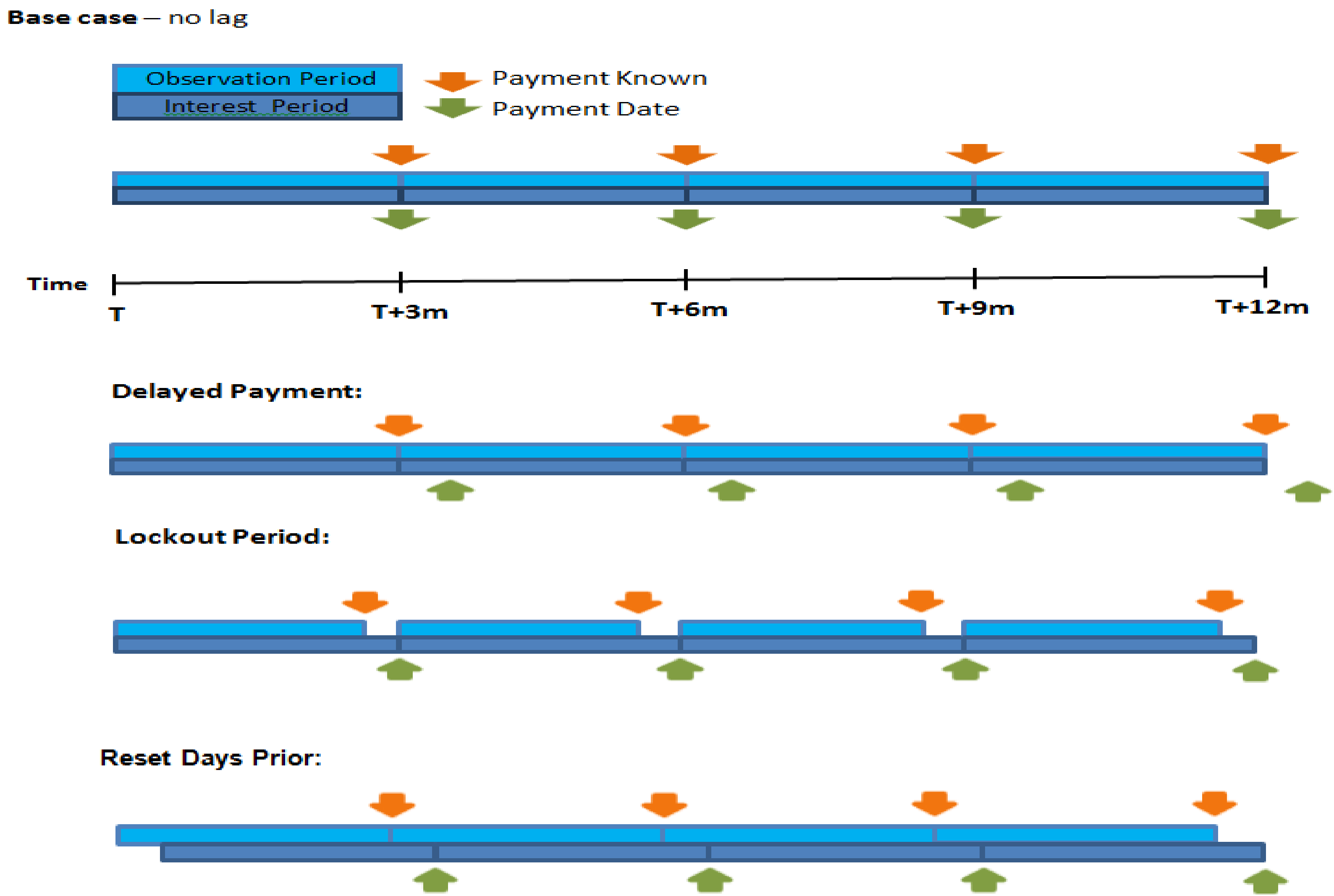
Approaches for compounding in arrears



Approaches for compounding in arrears

European Bank for Reconstruction and Development

	Day 1 (First Day of Interest Period)	Day 2 SOFR for Day 1 Published	...	Day T-2 SOFR for Day T-3 Published	Day T-1 SOFR for Day T-2 Published	Day T (Last Day of Interest Period) SOFR for Day T-1 Published	Day T+1 (First Day of Next Period) SOFR for Date T Published	Day T+2
Plain Arrears	Use SOFR for Day 1	Use SOFR for Day 2	...	Use SOFR for Day T-2	Use SOFR for Day T-1	Use SOFR for Day T	Payment due	
Arrears with Payment Delay	Use SOFR for Day 1	Use SOFR for Day 2	...	Use SOFR for Day T-2	Use SOFR for Day T-1	Use SOFR for Day T	OIS generally settle on T+2	Payment due
Arrears with 1-Day Lockout	Use SOFR for Day 1	Use SOFR for Day 2	...	Use SOFR for Day T-2	Use SOFR for Day T-1	Use SOFR for Day T-1	Payment Due	
Arrears with 1-Day Lookback	Use SOFR for Day 0	Use SOFR for Day 1	...	Use SOFR for Day T-3	Use SOFR for Day T-2	Use SOFR for Day T-1	Payment Due	

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Hybrid Methods

- ***Principal Adjustment***

- **Interest payments are set in advance**, at the beginning of each interest period,
- but **principal on the loan changes over time based on the difference between the in advance and in arrears calculations for each period**

e.g. if rates moved up over the interest period, then more of the payment would go to cover interest expenses and remaining principal would be higher, while if interest rates moved down then remaining principal would be lower

- ***Interest rollover***

- **Interest payments are set in advance**, at the beginning of each interest period
- any difference between the amount of interest paid and the interest accrued in arrears is simply **rolled over into the payment for the next interest period**.

The Index

Using SOFR example, the Index would be calculated as follows for each day of publication:

$$SOFR\ Index = \begin{cases} 1, & i = 4/2/18 \\ \prod_{April\ 2,\ 2018}^{i} \left(1 + \frac{SOFR_i * n_i}{360}\right), & i > 4/2/18 \end{cases}$$

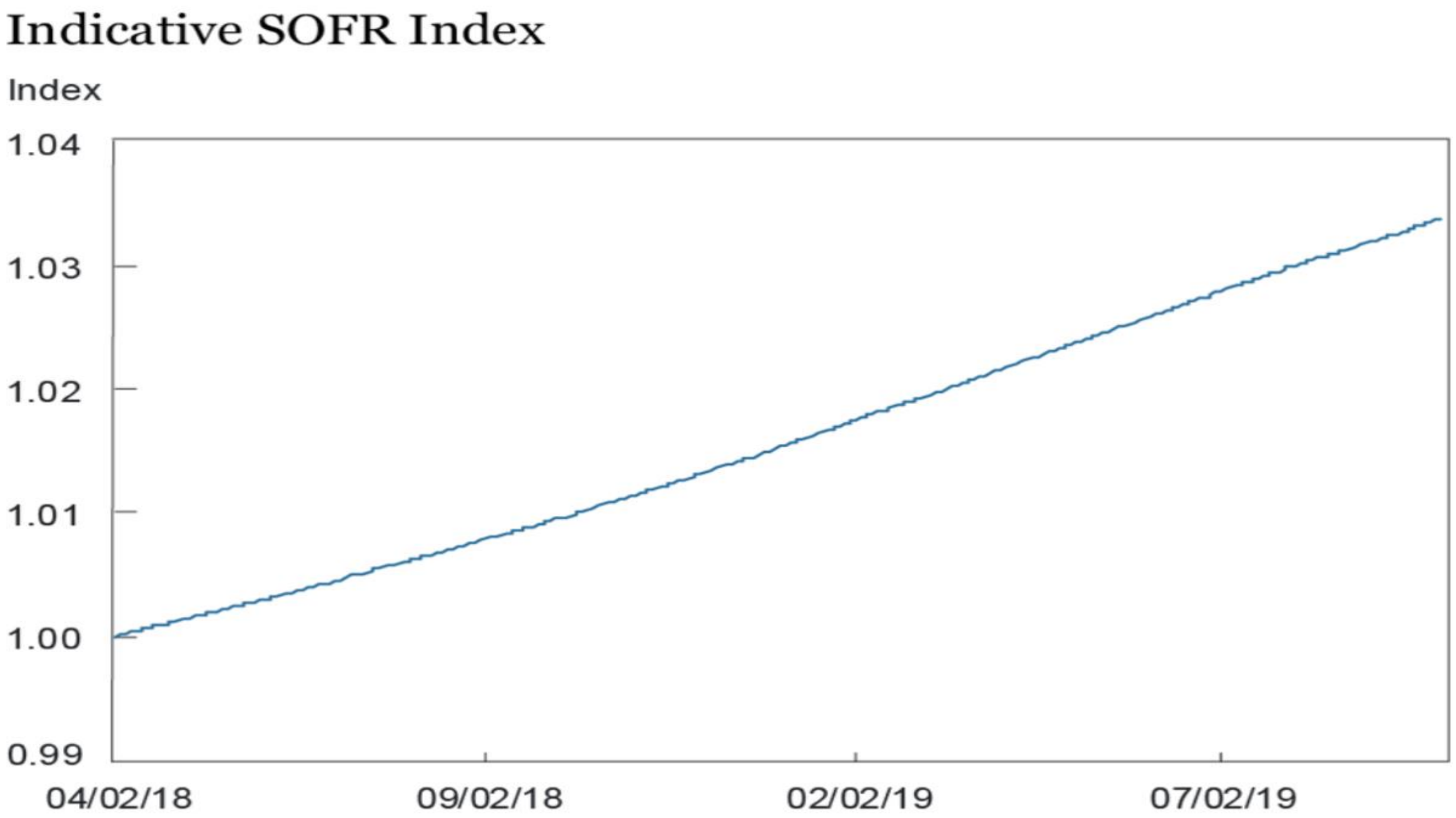
Where

$SOFR_i$ = SOFR applicable on business day i

n_i = number of calendar days for which $SOFR_i$ applies

i represents a series of ordinal numbers representing each business day in the calculation period

The Index



Source: New York Fed Staff Calculations

The Index

The Term (compounded) Rate for any interest period can then be calculated by looking up the index level from the start date and the end date of the period. Interim rates do not need to be known.

Using SOFR in this example, the calculation would be as follows:

$$SOFR\ Average\ between\ x\ and\ y = \left(\frac{SOFR\ Index_y}{SOFR\ Index_x} - 1\right) \times \left(\frac{360}{d_c}\right)$$

Where:

x = start date of calculation period

y = end date of calculation period

d_c = the number of calendar days in the calculation period

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