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Update on the hybrid Euribor methodology

Euro RFR Working Group

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Overview

- **Euribor Reform**—evolving the current quote-based determination calculation to a fully transaction-based methodology, in order to provide the market with a more transparent, robust, and representative index.
- The transaction-based Euribor methodology developed by EMMI sought to meet the following criteria:
  - ✓ Be anchored in observable transactions whenever possible;
  - ✓ Be robust in the face of market dislocation and command confidence that the benchmark remain resilient in times of stress;
  - ✓ Minimize the opportunities for market manipulation.
- **2016/17 pre-live verification program—**the daily determination of the index would be based, for most tenors, on a limited number of transactions executed by a limited number of contributors: a fully transaction-based benchmark is not robust.
- The current quote-based methodology for Euribor is not BMR-compliant.

Benchmark Specification: Euribor's Underlying Interest

➡ The current Euribor specification comes with a number of shortcomings, related to elements in its statement that may be considered open for subjective interpretation:

*"the rate at which euro **interbank** deposits **are being offered** within the EU and EFTA countries by **one Prime Bank to another at 11AM Brussels time**."*

interbank	being offered	Prime Bank	at 11 AM
…the use of interbank transactions in the original Euribor specification reflects the structure of the money markets in the 1980s and 1990s when bank-to-bank activity was a predominant source of bank wholesale funding…	*…the family of IBOR indices are based upon and aimed at representing funding markets. This is supported by the fact that LIBOR, originally evolved as a standardized benchmark for the pricing of floating-rate corporate loans.*	*"Prime Bank" has never been precisely defined. The Prime Bank historically represented both a concept of the financial standing of the party borrowing funds and of a substantial party supplying funds.*	
wholesale	**borrowing**	**own cost of funds**	

*"Euribor is a measure of the rate at which **wholesale funds** in euro could be **borrowed** by **credit institutions** in the EU and EFTA countries in the unsecured money market"*

- **Hybrid methodology**—supported by transactions whenever available, but relies on other techniques or data sources according to input criteria established by EMMI

- The hybrid methodology follows a hierarchy. For each day in which the index is calculated, contributing banks will have to base their submissions, for each tenor, on:

Schematic description
Hybrid Euribor methodology

Level 1	Submission based solely on transaction in the Underlying Interest at the Defined Tenor from the prior TARGET date, using a formulaic approach provided by EMMI.
Level 2	Submission based on transactions in the Underlying Interest across the money market maturity spectrum and from recent TARGETdays, using a defined range of formulaic calculation techniques provided by EMMI.
Level 3	Submission based on transactions in the Underlying Interest and/or other data from a range of markets closely related to the unsecured euro money market, using a combination of modeling techniques and/or the Panel Bank's judgement.

Level 2.1	Spread Adjustment Interpolation based on Level 1 submissions at adjacent tenors
Level 2.2	Use of Non-Standard Maturity Transactions
Level 2.3	Submission based on market-adjusted Level 1 submissions from prior dates

Overview

Hybrid Euribor Testing Phase

- To finalize the design of the methodology, a **test under live conditions** was conducted by EMMI from May until end of July 2018.
  - **Sixteen (16) out of the 20 panel banks** agreed to participate in the exercise.
  - **All panel banks were asked to develop a Level 3 submission methodology** following the guidelines provided by EMMI, and EMMI collected their documented procedure ahead of the start of the Testing Phase.
  - Out of the 16 participating banks, EMMI decided to fully **exclude the contributions of one bank**, as their submissions were not in line with the underlying interest for Euribor.

- Publication of Second Public Consultation on Hybrid Methodology for Euribor on 17 October 2018.

Overview

Euribor €MMI

Overview of unsecured money market activity

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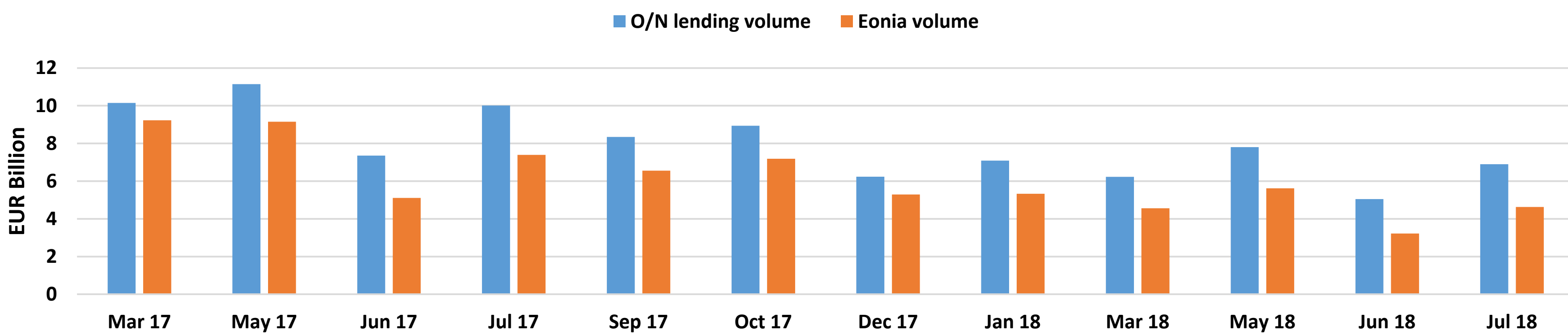
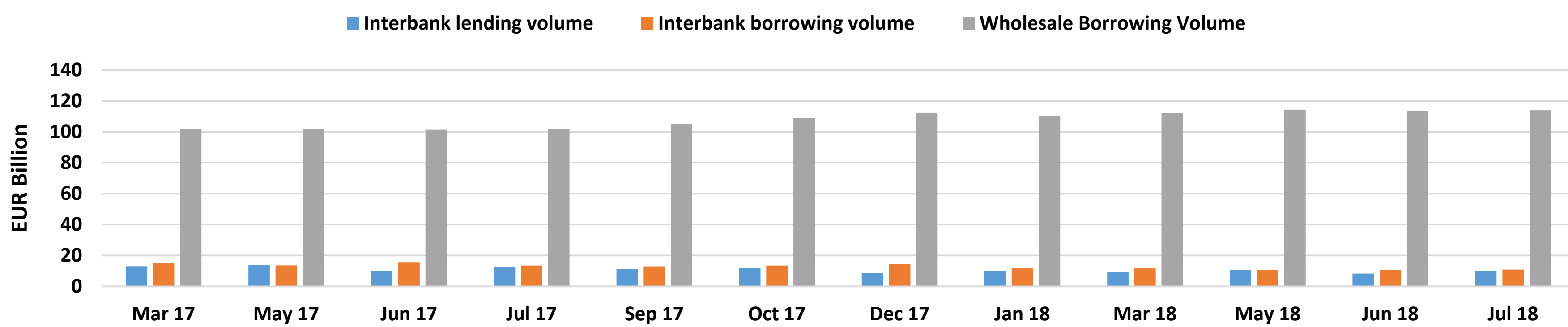
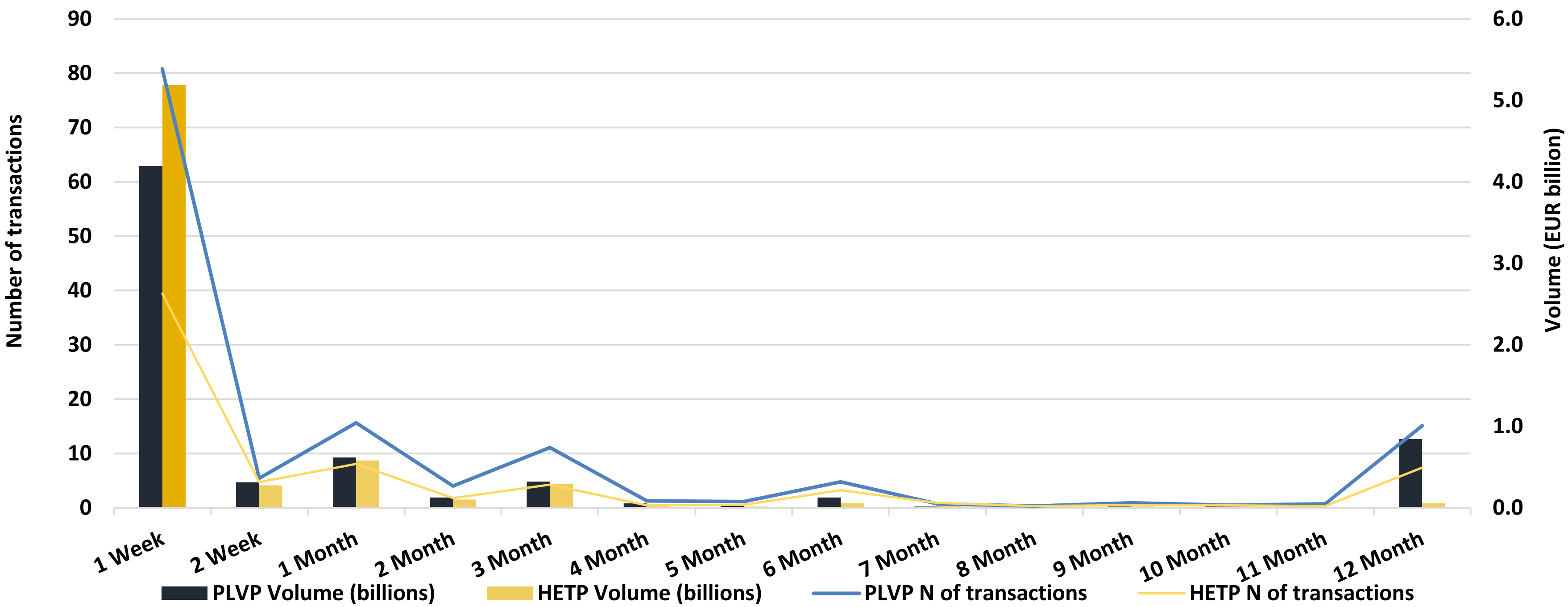
- Public available sources of data to gauge unsecured money market activity:
  - For overnight interbank lending: EONIA (28 reporting banks)
  - For overnight and term borrowing and lending: ECB's MMSR (52 reporting banks)





Overview of unsecured money market activity

➡ EMMI has gained further visibility on the market underpinning Euribor during the Pre-Live Verification Program (PLVP, which run from Sept 16 – Feb 17) and the Hybrid Euribor Testing Phase (HETP, from May 18 – July 18).



Average daily

PLVP data restricted to common participants in HETP

Overview

Analysis: methodological choices

➡ The methodology is organized in three levels. The analysis provided a basis for EMMI to decide on the final blueprint:

	Parameter/feature	Considered options	#
Level 1 (transaction-based)	Maturity buckets	Narrow or broad	2
	Transactions with NFCs*	Included or excluded	2
	Transactions at a floating rate	Included or excluded	2
	Volume thresholds	None, 10 mio., or 20 mio.	3
	Number of transactions threshold	1, 2, or 3	3
Level 2 (transaction-derived)	(Level 2.1) Spread Adjustment Factor—SAF**	1, 3, 5, 10, and without SAF	5
	(Level 2.3) Market Adjustment Factor—MAF	4, 5, 6, 7, and no use of futures	5
Level 3			
Aggregation	Outlier removal technique	Trim 0.15, Trim 0.20, Median group	3
			5,400

*NFC stands for Non-Financial Corporate

**SAF and MAF stand for Spread Adjustment Factor and Market Adjustment Factor, respectively. A full definition can be found in the Second Consultation on the Hybrid Methodology for Euribor.

➡ Analysis structured to separate decisions for Level 1 input data from other parameters and considerations (arising from Level 2 or aggregation method).

Level 1		
Maturity buckets	Broad	Increase in the average daily volume considered in the determination of the index without significant impact on average rate level and standard deviation.
Transactions with NFCs	Excluded	While numerous, analyses conclude its inclusion would increase the index's volatility for reasons not directly related to the ability of a reporting bank to attract funds.
Transactions at a floating rate	Included	Fixed-rate equivalent contribute to the anchoring of the index in real transactions conducted at market price. Significant source of funds for French reporting entities.
Volume thresholds	20 mio.	Analyses reveal a reduction in the standard deviation of the sample when considering a higher threshold. In addition, a higher volume threshold acts as a deterrent for counterparties to panel banks to influence the index.
Number of transactions threshold	1 transaction	Levels of liquidity in the unsecured euro money market do not allow for a higher threshold. The statistical analysis reveals no significant impact on an increase in the threshold. The number of Level 1 contributors would, however, decrease further.

Analysis: methodological choices

➡ Following these choices, 75 designs for the methodology remained eligible.

	Parameter/feature	Considered options	#
Level 1 (transaction-based)	Maturity buckets	Broad	
	Transactions with NFCs*	Excluded	
	Transactions at a floating rate	Included	
	Volume thresholds	20 mio	
	Number of transactions threshold	1	
Level 2 (transaction-derived)	(Level 2.1) Spread Adjustment Factor—SAF**	1, 3, 5, 10, and without SAF	5
	(Level 2.3) Market Adjustment Factor—MAF	4, 5, 6, 7, and no use of futures	5
Level 3			
Aggregation	Outlier removal technique	Trim 0.15, Trim 0.20, Median group	3
			75

*NFC stands for Non-Financial Corporate

**SAF and MAF stand for Spread Adjustment Factor and Market Adjustment Factor, respectively. A full definition can be found in the Second Consultation on the Hybrid Methodology for Euribor.

Analysis: methodological choices

- The remaining parameters allow certain level of control on the frequency of reliance of the submitting panel bank in Level 3. [Under the assumption the panel bank has transactions or recent level 1 submissions.]

Minimize panel banks' reliance on Level 3

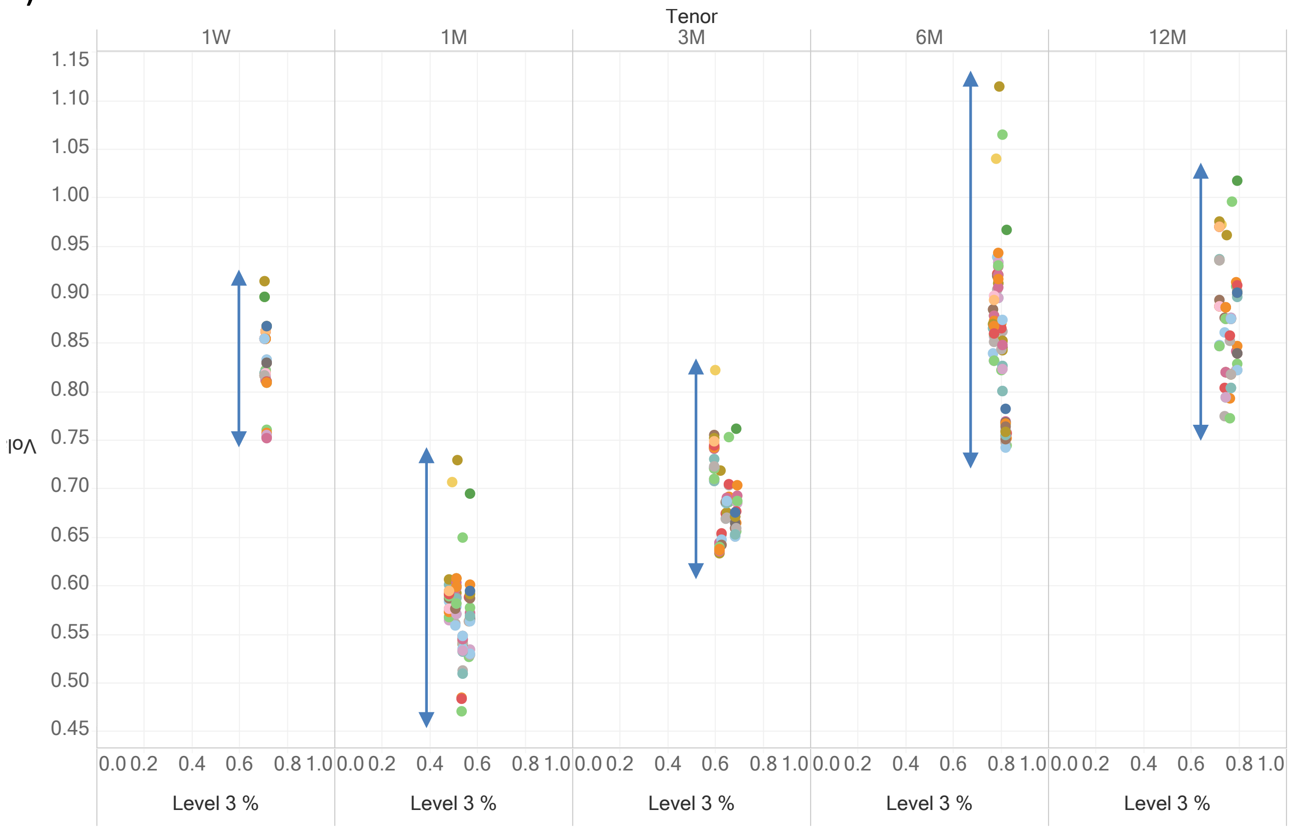
- The aggregation method allows a certain level of control over the impact of outlier submissions in the index.

Control the effect of outlier submissions on the volatility of the index

- Any choice must guarantee the index's responsiveness to market events, e.g. changes in ECB's key interest rates or changes in funding dynamics in countries in the Eurozone. In this respect, too long lookback periods, or excessive use of market-related information could introduce a lag.

Analysis: methodological choices

- Each point in this scatterplot represents a particular choice of the triple (SAF, MAF*, aggregation method).



*SAF and MAF stand for Spread Adjustment Factor and Market Adjustment Factor, respectively. A full definition can be found in the [Second Consultation on the Hybrid Methodology for Euribor](#).

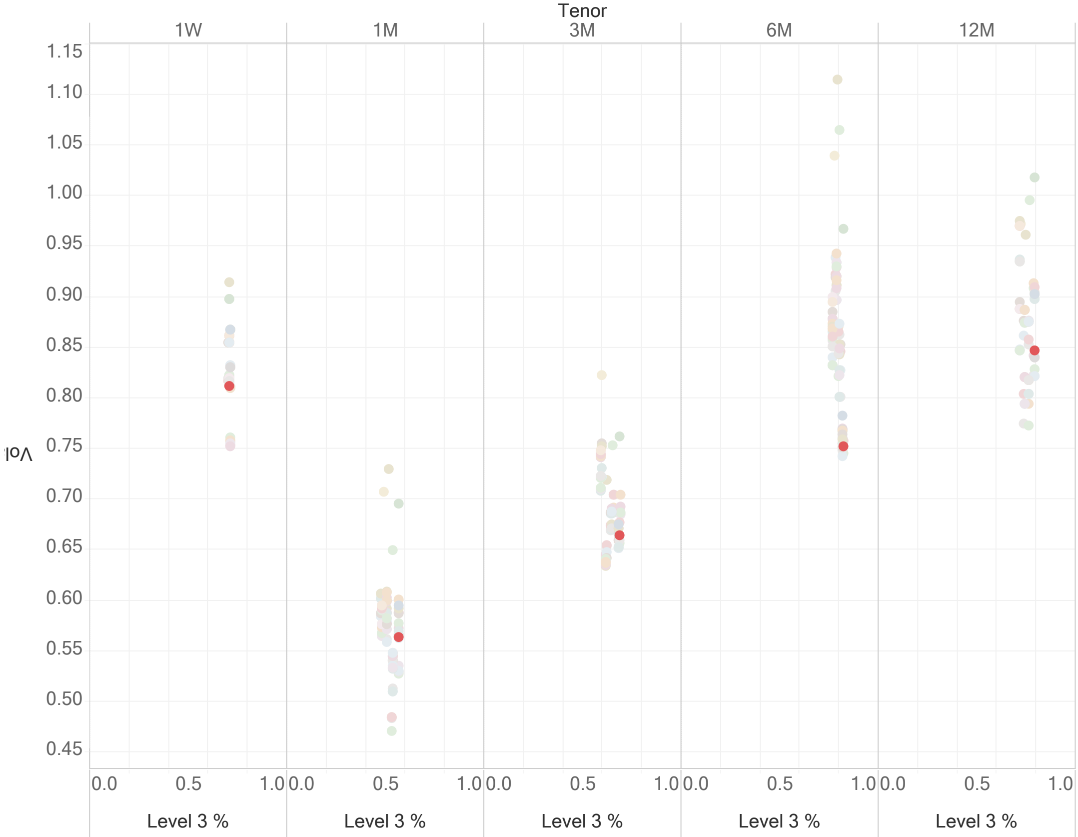
Analysis: methodological choices

SAF = 5 (to allow for the yield curves of the panel banks to reflect the *curvature* of recent days).

MAF = 4 (moderate look back period, to allow for changes in the market to be reflected in panel banks' submissions when using prior days' data)

Need to guarantee rate responsiveness to market events.

Alternatives do not offer significant changes on volatility of resulting rate, nor significant reduction on fall-back to Level 3 submissions.



Analysis: methodological choices

➡ The final parametrization of the methodology is then:

	Parameter/feature	Considered options
Level 1 (transaction-based)	**Maturity buckets**	Broad
	Transactions with NFCs	Excluded
	Transactions at a floating rate	Included
	Volume thresholds	20 mio
	Number of transactions threshold	1
Level 2 (transaction-derived)	**(Level 2.1) Spread Adjustment Factor**	5
	(Level 2.3) Market Adjustment Factor	4
Level 3		
Aggregation	**Outlier removal technique**	Trim 0.15

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Overview

Hybrid Euribor indicators

E

Reliance on hybrid methodology levels (SAF = 5, MAF = 4, Trim 0.15)

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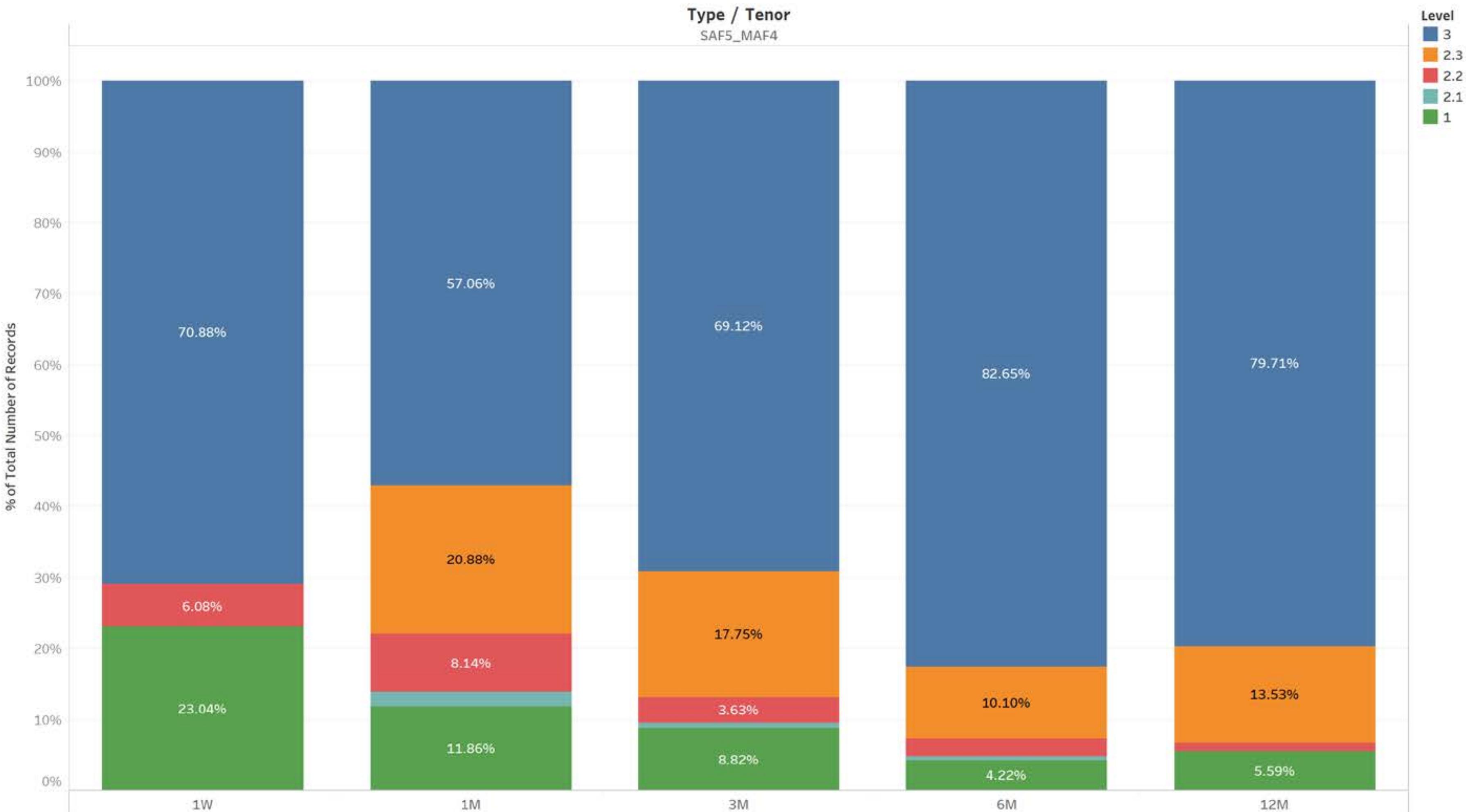

Hybrid Euribor indicators

Euribor under quote-based methodology

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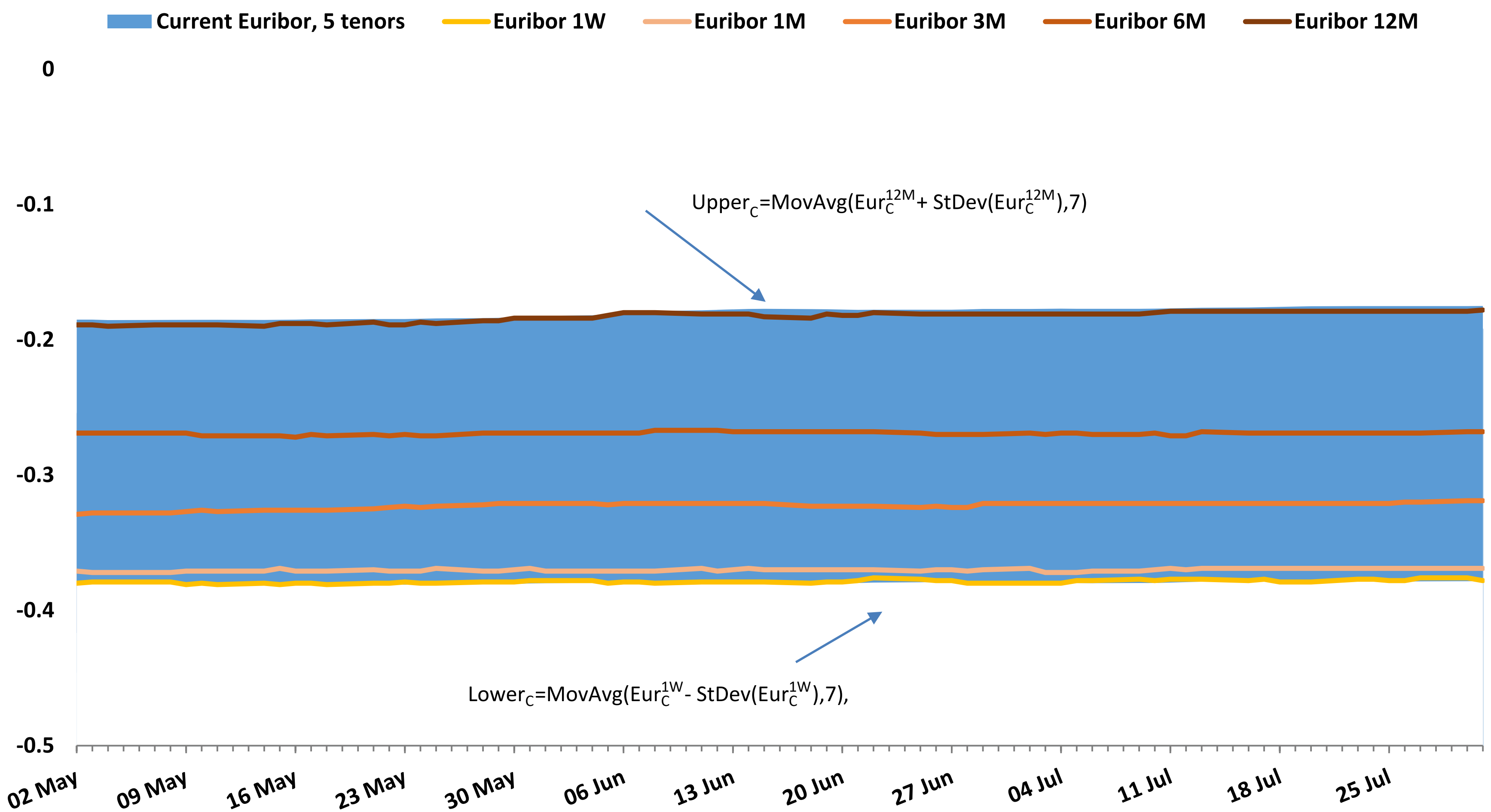
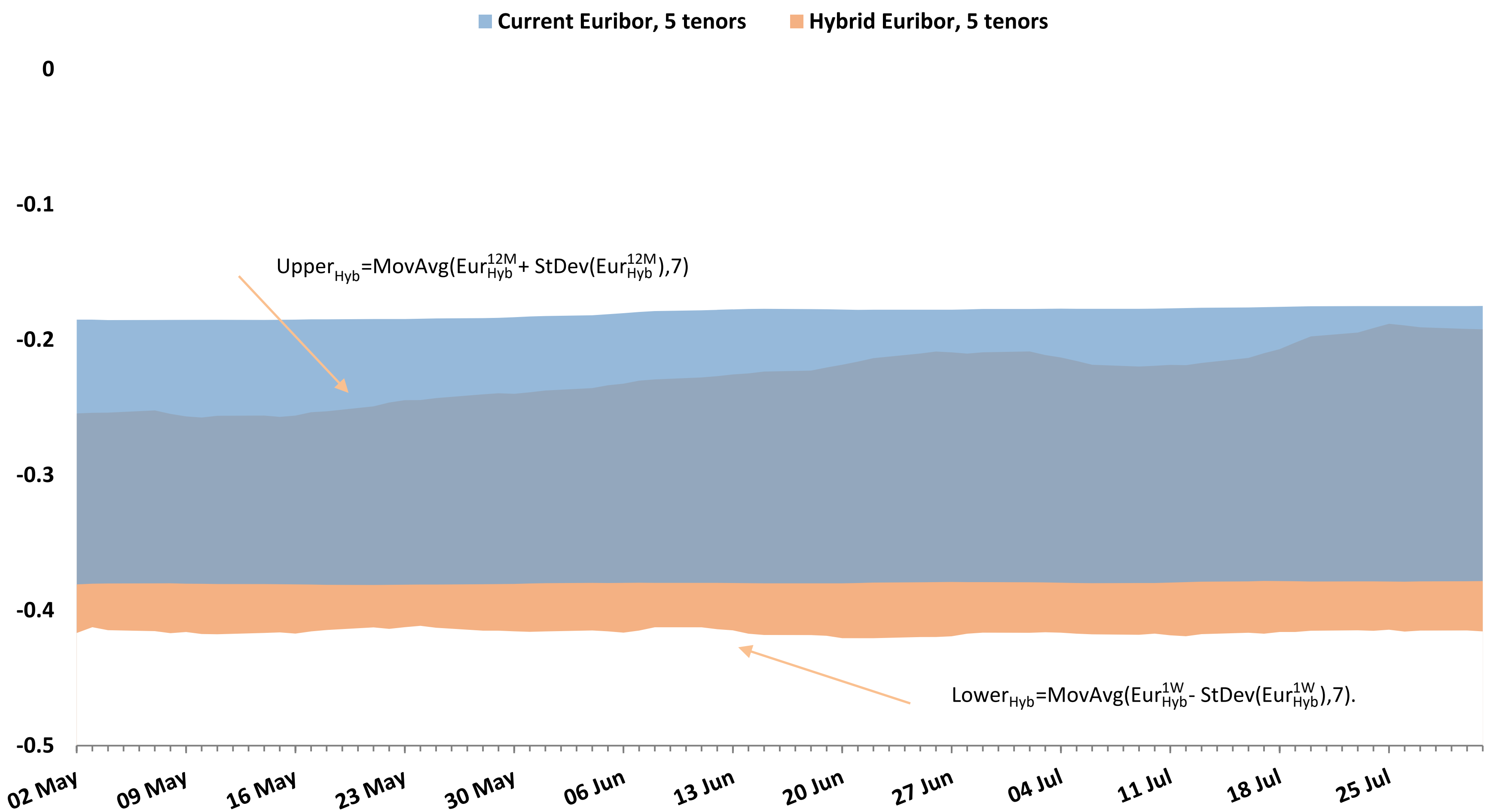


Hybrid Euribor indicators

Euribor under hybrid methodology



Hybrid Euribor indicators

E

Pure Level 1 index, fully transaction-based

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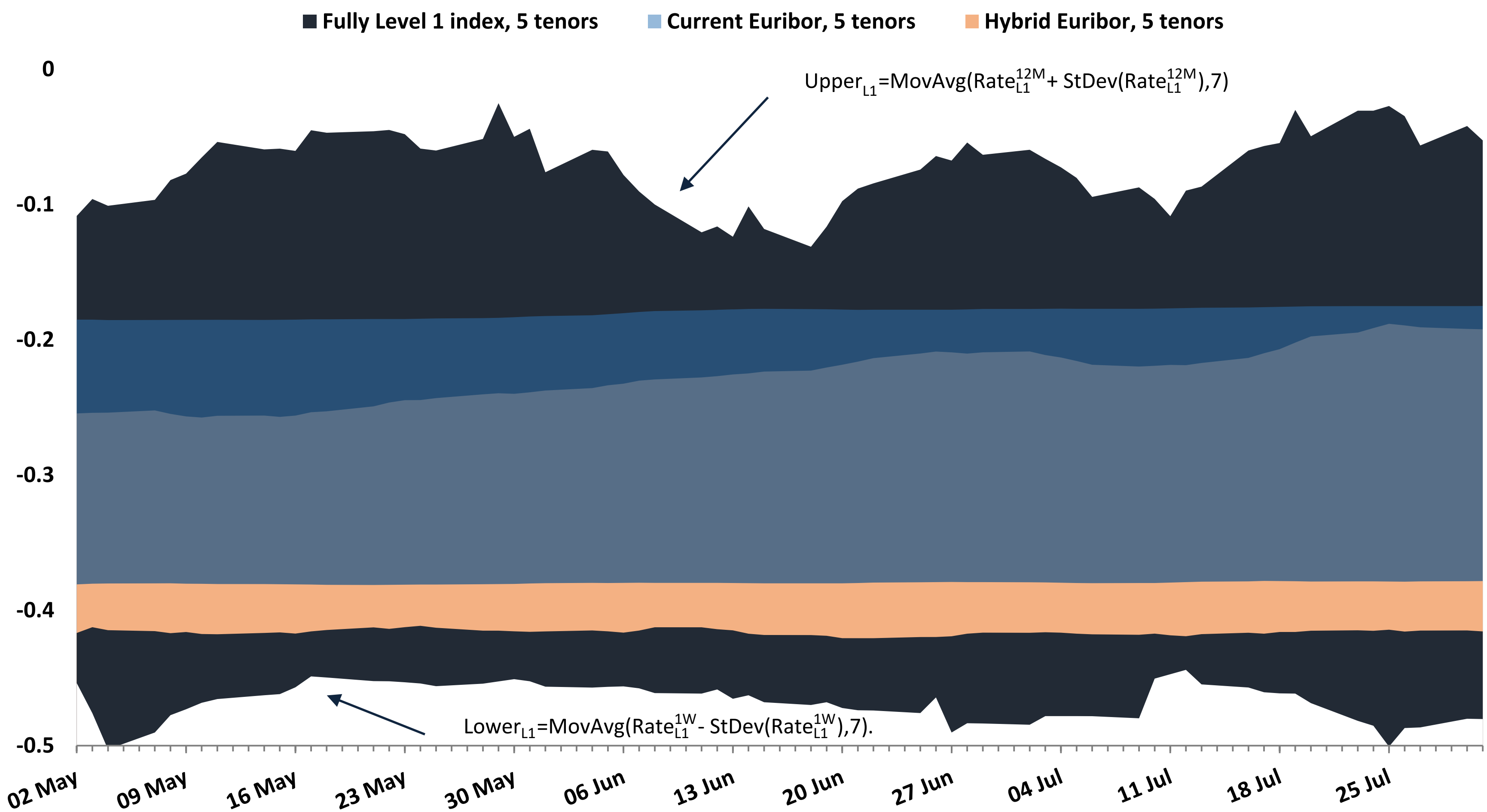

Appendix: supporting charts

Analysis: methodological choices

Non-financial corporate counterparties

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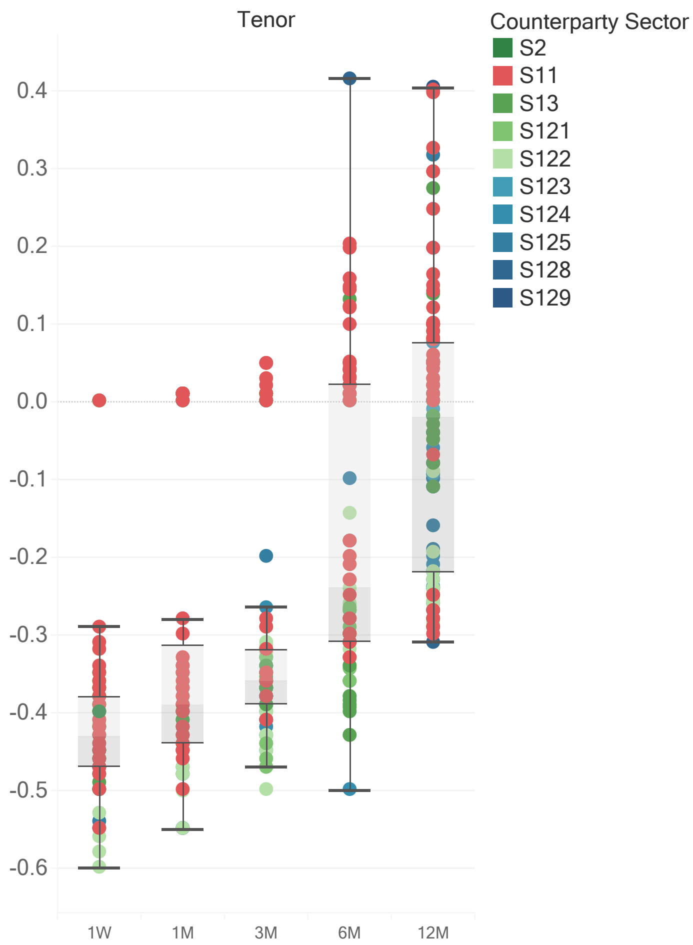
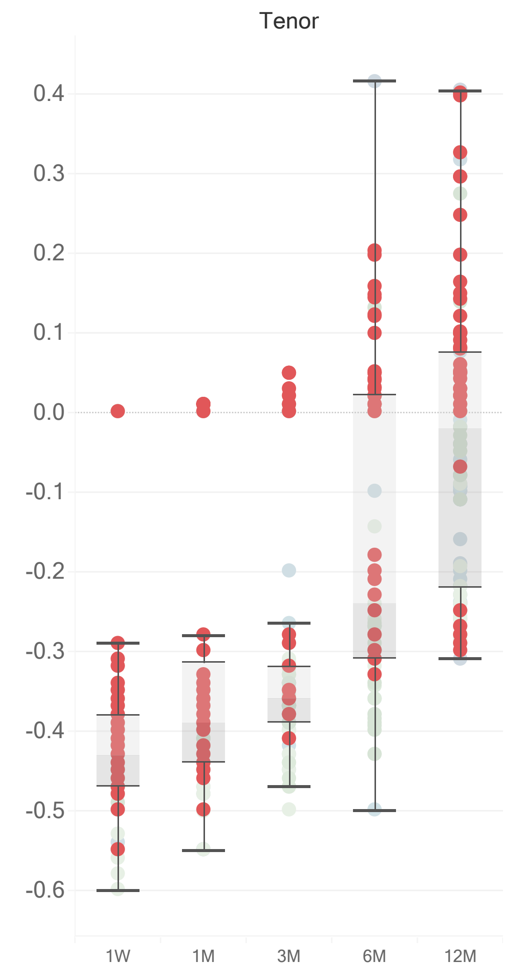
- Transactions with non-financial corporate counterparties are ubiquitous…

S11	All rates	Excluding ≥0 rates
1W	184	153
1M	134	77
3M	69	21
6M	112	19
12M	249	12
No Valid Tenor	1367	1190

- …but the data confirms their pricing is guided by factors not directly related to banks' funding needs.





Analysis: methodological choices

Floating rate transactions linked to EONIA

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- Floating rate transactions, however, are priced at market levels.
- They are an important instrument for some tenors—for the 12 months, trades executed at a floating rate exceed the volume of trades with fixed rates.

Floating rates	1W	1M	3M	6M	12M
Interbank	--	--	--	50 mio	575 mio
Official Sector	--	--	--	--	925 mio
Other Financials	--	--	360 mio	--	--