

# Auctions and liquidity conditions in the italian government bond market

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# Motivation

- ▶ The importance of liquidity in financial markets
  - ▶ liquidity loop between primary and secondary market
  - ▶ public debt management and efficiency of secondary bond markets
- ▶ Italian public debt size and the strong reliance on market makers
  - ▶ Outstanding €2.340 tn (of which, ca. 73% in BTP) - April 2022
  - ▶ MTS Italy is the first electronic quote-driven market for sovereign bonds
  - ▶ 16-17 market makers have quoting and “competitiveness” requirements (e.g., Mormando and Greco 2020)
  - ▶ Multiple linked platforms/services (e.g., repo market)
  - ▶ The Treasury uses market makers’ advice to define its PDM strategy

# Liquidity in financial markets and information

- ▶ The information loop between primary and secondary (government) bond markets:
  - ▶ Auctions influence secondary market functioning (yields and prices follow a cyclic movement around auction day - e.g., Lou et al. 2013; Beetsma et al. 2018), open questions:
    - ▶ what is the impact on liquidity?
    - ▶ is the informative effect of auctions on liquidity persistent?
    - ▶ Constant over time? Irrespective of market conditions? (e.g., high-volatility vs low-volatility)

# Dataset

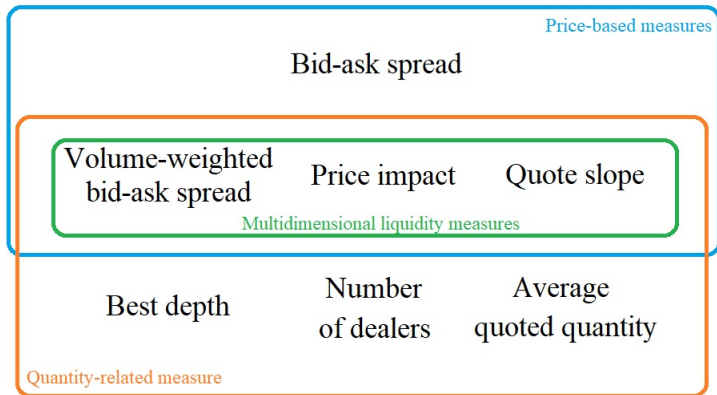
- ▶ Object of study: on-the-run 3-, 7-, 10-year BTPs
- ▶ Time sample: from 1st January 2016 to 31st December 2019 split in 103 auction cycles (+/- 4 days around auction day)
- ▶ Primary market
  - ▶ data on all non-first auctions' results published on the Italian Treasury website (103)
- ▶ Secondary market
  - ▶ 5-minutes interval data of prices and quantities of the book of MTS Italy Cash market to obtain 7 liquidity measures (our dependent variables)
- ▶ Relevant covariates (3m EURIBOR-EONIA spread, market volatility)

# How to measure auction's informativeness?

## Auction's indicators of performance

- ▶ **Bid-to-cover ratio:** total amount bid by primary dealers and the total amount supplied by the Treasury
  - ▶ the only indicator used in the literature (e.g., Goldreich 2007; Lou et al 2013; Beetsma et al. 2018)
  - ▶ does it really tell how informative is the auction?
- ▶ **Overpricing index:** difference between the net allocation price and the mid-price of the bond on the secondary market five minutes before the auction, scaled down by the original maturity of the security.

# Liquidity measures



## Summary statistics of dependent variables

	<b>Before</b>	<b>After</b>
Bid-ask spread	0.099	0.089
Volume-weighted bid-ask spread	0.159	0.147
Price impact	0.053	0.048
Quote slope	0.040	0.036
Best depth	22.709	21.918
Number of dealers	3.64	3.53
Average quoted quantity	5.987	5.964

**Table: Average values of liquidity metrics before and after the auction in a 9-day time window.** The values before the auction are averages of the 5 days before the auction. The values after the auction are averages of the 5 days next to the auction.

## Baseline model

- ▶ Panel regression with fixed-effects
- ▶  $N = 103$  (auctions) and  $T = 11$  (length of the auction cycle)
- ▶ baseline specification

$$LIQ_{i,t} = \alpha_0 + \beta_1 AUC_t^i + \beta_2 postAUC_t^i + \sum_{m=1}^2 \gamma_m X_m + \epsilon_t, \quad (1)$$



## Results: baseline specification

	<b>BA</b>	<b>VWBA</b>	<b>PI</b>	<b>QS</b>	<b>BD</b>	<b>ND</b>	<b>AQQ</b>
AUC	-0.018***	-0.011*	-0.008**	-0.002	-2.63***	-0.52***	1.24
postAUC	-0.015*	-0.019**	-0.007*	-0.006**	-0.17	-0.02	7.61

Figure: Baseline regression.

## Auction reopenings: a first robustness check

- ▶ Auction reopenings: additional amount offered by the Treasury to PDs the day after the auction at the same auction price.

	<b>BA</b>	<b>VWBA</b>	<b>PI</b>	<b>QS</b>	<b>BD</b>	<b>ND</b>	<b>AQQ</b>
AUC	-0.018***	-0.011*	-0.008**	-0.002	-2.63***	-0.52***	1.22
postAUC	-0.015*	-0.019**	-0.009*	-0.006**	-0.21	-0.0001	8.57
reopening	-0.001	0.003	-0.005	0.002	0.303	-0.13	-8.88

Figure: Reopening regression.

## Auction's indicators of performance

$$LIQ_{i,t} = \alpha_0 + \beta_1 AUC_t^i + \beta_2 I_t^i + \beta_3 postAUC_t^i + \sum_{m=1}^2 \gamma_m X_m + \epsilon_t \quad (2)$$

where  $I_t^i$  defines the indicator of performance of the auction (bid-to-cover ratio and the overpricing indicator).

## Results: Auction's indicators of performance

	<b>BA</b>	<b>VWBA</b>	<b>PI</b>	<b>QS</b>	<b>BD</b>	<b>ND</b>	<b>AQQ</b>
AUC	-0.013**	-0.004	-0.005**	0.006	-2.69***	-0.53***	-3.45
postAUC	-0.015*	-0.019**	-0.007*	-0.006**	-0.17	-0.02	7.61
OP	-1.069	-1.3*	-0.582	-0.46**	12.45	1.34	917.5
AUC	-0.03	-0.005	-0.01	0.004	0.27	0.16	-8.48
postAUC	-0.015*	-0.019**	-0.01*	-0.006**	-0.17	-0.02	7.61
BC	-0.01	-0.01	-0.001	-0.004	-1.94	-0.45	6.49

Figure: Baseline regression with auction's performance indicators

## High-/low-volatility market conditions

- ▶ Same empirical model as in the baseline specification
- ▶ Sample split in 2,  $N = 58$  auctions cycles in very volatile market conditions,  $N = 55$  in low-volatility periods
- ▶ Volatile market conditions: auction when market volatility is above its long-term average.

## Results: High-/low-volatility market conditions

	<b>BA</b>	<b>VWBA</b>	<b>PI</b>	<b>QS</b>	<b>BD</b>	<b>ND</b>	<b>AQQ</b>
AUC	-0.014	-0.001	-0.005	0.002	-2.63***	-0.43***	-4.58
postAUC	-0.026*	-0.031*	-0.012*	-0.009*	-0.17	-0.005	13.1
OP	-1.301	-1.596**	-0.708*	-0.57**	12.23	-0.31	1093.9

	<b>BA</b>	<b>VWBA</b>	<b>PI</b>	<b>QS</b>	<b>BD</b>	<b>ND</b>	<b>AQQ</b>
AUC	-0.013***	-0.007*	-0.006***	0.001	-2.78***	-0.63***	0.32**
postAUC	-0.001	-0.005	-0.001	-0.002	-0.18	-0.05	0.0005
OP	0.261	-0.348	0.071	-0.115	7.84	-0.16	32.19

**Figure: Baseline regression with overpricing indicator in high- and low-volatility market conditions.**

## Conclusions

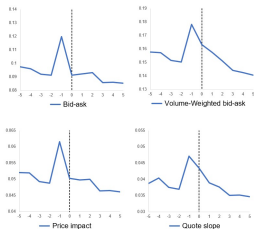
- ▶ Positive effect of auctions on the liquidity discovery process, specifically on price-based indicators
- ▶ Long-lasting impact
- ▶ Overpricing index is a better and more reliable indicator in determining the informativeness of auctions and improve liquidity conditions (if high enough)
- ▶ During periods of higher market uncertainty, the outcome of auctions is a more important signal for market makers than the event itself
- ▶ Heterogeneous behaviour among market makers (more granular, dealer-level data needed)

Thank you for your attention!



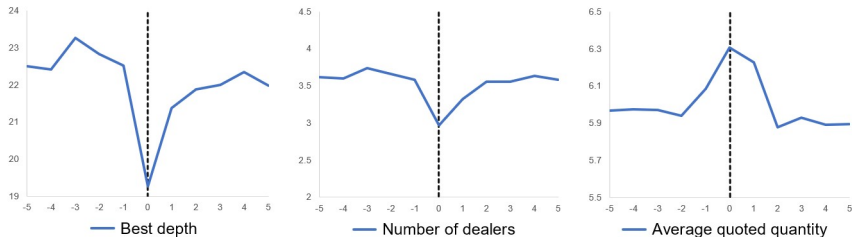
# Background slides

## Liquidity measures evolution around auctions. (1)



**Figure:** Price-based and multidimensional liquidity measures. The figure shows the dynamics of the bid-ask spread in percentage of the mid-price (BA), the volume-weighted bid-ask spread in percentage of the mid-price (VWBA) the price impact of a 20 mn deal (PI) and the quote-slope (QS).

## Liquidity measures evolution around auctions. (2)



**Figure:** Quantity-based liquidity measures. The figure shows the dynamics of the depth at the best available quotes (BD), the average number of dealers quoting at the best prices (ND) and the average quoted quantity by a single dealer at the best prices (AQQ).