

Secondary Market Liquidity: the Role of Repo Market Specialness

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Why is liquidity important?

- ▶ Large and growing government debts (OECD 2023)
 - increase in sovereign bond yields
- ▶ Public debt management and efficiency of secondary market
 - secondary market not sufficiently liquid \Rightarrow primary dealers request larger premia (higher yields) on issued bonds to face such a liquidity risk \Rightarrow Treasury bears a larger cost of debt
- ▶ Why Italy?
 - large amount of debt: almost € 2,863.4 billion at the end of 2023, 83.1% represented by negotiable bonds (MEF 2024)
 - MTS Italy is the first electronic market for sovereign bonds in Europe
 - Italian Treasury evaluates the activities of primary dealers on primary and secondary markets / intervenes on the repo market
 - multiple linked platforms/services (e.g., repo market)

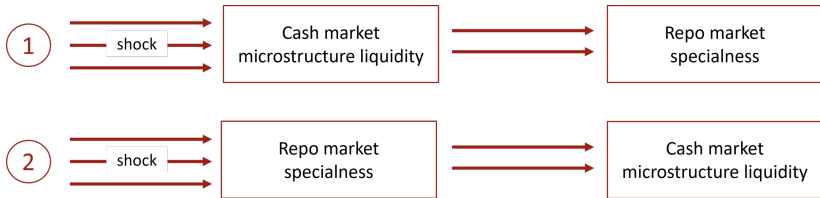
Specialness on repo market

- ▶ Repurchase agreements (repos) using Italian government bonds as collateral
- ▶ Repo rates are implied by the difference between the spot price and the repurchase price at a future date
- ▶ Repo market is essential for well-functioning and efficiency of cash market: repos are used by bond market participants to either finance long positions or initiate short positions
- ▶ Direction of trading: financing vs. reverse
- ▶ Type of repos: General Collateral (GC) vs. Special
- ▶ Specialness is defined as the premium of procuring a specific bond in the repo market: the higher the specialness the higher the scarcity (Corradin and Maddaloni 2020)

Cash and repo markets

- ▶ Open questions:
 - Which is the relation between the scarcity of a specific bond in the repo market and the liquidity of the same bond in the cash market?
 - Empirical investigation: higher specialness \Rightarrow lower liquidity ?
- ▶ Cash and repo markets are intertwined:
 - a more liquid bond allows dealers to hold the optimal level of inventories and not to have portfolio imbalances; hence, dealers do not need to rely on the repo market with an effect on the specialness of this bond
 - a more special bond means that this bond shows some shortage in the repo market; in turn, dealers face some frictions trading such a bond in the secondary market, which arguably leads to worse liquidity conditions

Cash and repo markets



Contribution to the literature

- ▶ The effect of secondary market liquidity on the repo market specialness is explored in the literature
 - theoretically (e.g., Duffie 1996; Vayanos and Weill 2008)
 - seminal prediction: more liquid bond \Rightarrow higher specialness (Duffie 1996)
 - inverse prediction: higher specialness \Rightarrow more illiquid bond (Huh and Infante 2021)
 - empirically (e.g., Corradin and Maddaloni 2020; Dufour et al. 2020)
- ▶ Our main contribution: controlling for endogeneity we show that repo market specialness is a driver of the secondary market liquidity

Dataset

- ▶ Three main sources of data:
 - Cash segment of MTS Italy, with information including the ISIN of the government bond, the bid price and the ask price at closing time
 - Repo segment of MTS Italy, with information including the ISIN of the underlying government bond, the type (GC or special), the maturity (e.g., tomorrow-next and spot-next), the daily average rate and the volume of daily transactions
 - Italian Treasury's activity on repo market starting from 24th of May 2021
- ▶ Object of study: all securities for the various government bond segments (BOT, CTZ, BTP, BTP€i, CCTeu)
- ▶ Period from January 2019 to December 2023

Dataset

- ▶ Daily bid-ask spread: the most widely used liquidity indicator

$$\text{Bid-ask spread}_{i,t} = \frac{\text{Ask price}_{i,t} - \text{Bid price}_{i,t}}{\text{Mid-price}_{i,t}} \cdot 100$$

- ▶ Specialness: the Italian sovereign bond scarcity premium

$$\text{Specialness}_{i,j,t} = \text{GC rate}_{j,t} - \text{Special rate}_{i,j,t}$$

- i = specific security
 - j = repo maturity
 - t = day of trading
- ▶ Weekly average for each bond

Summary statistics

Table: Summary statistics of bid-ask spread (%)

Mean	0.0736
Standard deviation	0.1005
Minimum	0.0010
25th percentile	0.0187
50th percentile	0.0411
75th percentile	0.0874
Maximum	2.0467
Number of observations	167484
Number of bonds	313

Table: Summary statistics of specialness (%) for spot next repos

Mean	0.0585
Standard deviation	0.1197
Minimum	-0.4948
25th percentile	0.0110
50th percentile	0.0310
75th percentile	0.0639
Maximum	10.6649
Number of observations	166935
Number of bonds	313

Bidirectional causality

Table: Granger causality test in panel datasets (Lopez and Weber 2017) results

Period	Specialness does not Granger-cause bid-ask spread		Bid-ask spread does not Granger-cause specialness	
	\bar{Z} p-value	\tilde{Z} p-value	\bar{Z} p-value	\tilde{Z} p-value
2019	0.0000	0.0000	0.0377	0.0957
2020	0.0000	0.0002	0.0000	0.0000
2021	0.0000	0.0000	0.0000	0.0000
2022	0.0000	0.0000	0.0000	0.0000
2023	0.0077	0.0293	0.0251	0.0739
05/2019-12/2023	0.0000	0.0000	0.0000	0.0000
05/2021-12/2023	0.0000	0.0000	0.0000	0.0000

- Address endogeneity problem that arises by bidirectional causality with an instrumental variable approach

Regression specification

- ▶ Panel regression: $N = 229$ (securities) and $T = 136$ (weeks)

$$y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 \mathbf{X}_{3t} + \nu_i + v_{it}$$

- $y_{i,t}$ = bid-ask spread of bond i on week t
- X_{1it} = specialness of bond i on week t
- X_{2it} = outstanding amount of bond i issued until t
- \mathbf{X}_{3t} = time-varying controls (e.g., VIX, 3-month EURIBOR-ESTER spread)
- ν_i = bond fixed-effects

OLS panel regression results

Table: OLS panel regression results

Bid-ask spread	(1) Fixed-effects	(2) Random-effects
Specialness	0.110*** (0.00423)	0.110*** (0.00422)
Constant	0.086*** (0.00062)	0.063*** (0.00574)
Observations	18,577	18,577
R-squared	0.036	
Number of id	229	229

Standard errors in parentheses
 *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Instrument

- ▶ Italian Treasury's activity on the repo market, defined as the outstanding amount of weekly volumes of the operations on the repo market for a specific security
 - F-test for the relevance of the instrument is greater than 20 for the baseline specification
 - Exclusion restriction: we claim the instrument does not directly affect the bid-ask spread on the secondary market, given the declared purposes of the Italian Treasury activity on the repo market

IV panel regression results

Table: IV panel regression results for SN maturity

Bid-ask spread	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Specialness	1.592*** (0.320)	1.610*** (0.325)	1.716*** (0.331)	1.630*** (0.340)	1.723*** (0.336)	1.706*** (0.331)	1.699*** (0.327)	1.612*** (0.335)
Outstanding		9.17e-09 (3.90e-08)	9.12e-09 (4.14e-08)	6.92e-09 (3.94e-08)	6.71e-09 (4.14e-08)			
VIX			0.00151*** (0.000350)		0.00130*** (0.000422)	0.00132*** (0.000418)	0.00153*** (0.000347)	
Euribor-Ester				0.166* (0.0949)	0.178* (0.0971)	0.176* (0.0963)		0.163* (0.0939)
Constant	-0.0379 (0.0268)	-0.0394 (0.0272)	-0.0790*** (0.0247)	-0.0443 (0.0302)	-0.0787*** (0.0246)	-0.0778*** (0.0243)	-0.0780*** (0.0244)	-0.0428 (0.0298)
Observations	18,577	18,570	18,570	18,570	18,570	18,577	18,577	18,577
Number of id	229	229	229	229	229	229	229	229
F test	24.64	12.21	12.41	103.92	85.48	113.69	18.56	155.71

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

- ▶ On average, a one basis point increase in specialness is associated with more than 1.5 basis point increase in bid-ask spread

Concluding remarks

- ▶ Bidirectional causality between liquidity on the secondary market and specialness on the repo market
- ▶ Sound evidence that a higher level of specialness in the repo market negatively affects secondary market liquidity conditions (i.e., increases the bid-ask spread)
- ▶ Evidence that the Italian Treasury's activity on the repo market supports market makers by relaxing the frictions determined by the specialness and, thus, indirectly improves liquidity conditions on the secondary market

Thank you!

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