

Monetary Policy Transmission in Segmented Markets

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Motivation

- ▶ Short-term funding markets are the first stage of monetary policy transmission
- ▶ Repos provide the predominant form of short-term funding post GFC
 - ▶ short-term, fully or over collateralized with government debt
 - ▶ €500 billion daily turnover in the Euro-area (ECB, 2018)
- ▶ Experience rate dispersion *across* collateral

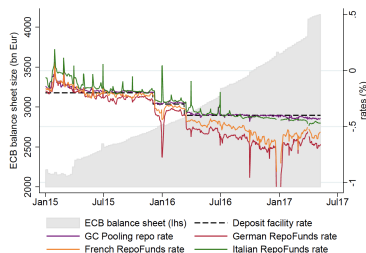


Figure: Deposit Facility Rate and Repo Rates (Arrata et al. 19)

Motivation

Current literature

- ▶ Rate dispersion across collateral in CCP-cleared repos due to collateral scarcity

We find

- ▶ significant rate dispersion for repos with identical collateral and loan terms

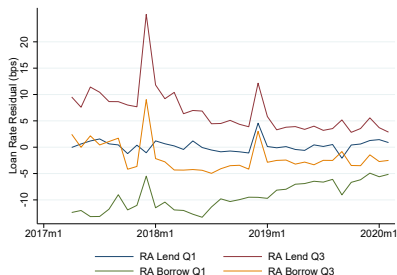


Figure: Dispersion in German Collateral Repo Rates (Residualized)

Motivation

We show that

- ▶ Dealer market power is a key friction in repo markets in addition to collateral scarcity
- ▶ Both frictions add up to impede monetary policy transmission

Why?

- ▶ Previous literature based on CCP-cleared repos
- ▶ Majority of market participants do not have access to CCPs
- ▶ Rely on concentrated OTC intermediation by dealer banks
 - ▶ 30% of repo volume in the Euro-area (ECB, 2018)
- ▶ We jointly analyze data on OTC repos with CCP repos

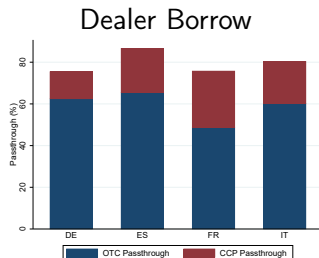
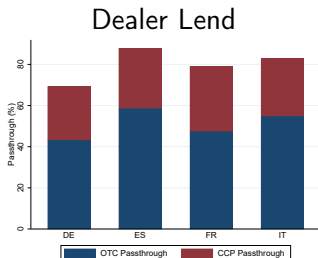
Conceptual Framework + Empirical Verification

How does an unsecured DFR transmit to repo markets?

- ▶ Two Frictions
 1. Collateral scarcity
 - ▶ ↓ Pass-through of DFR to CCP repo rates
 2. Dealers market power:
 - ▶ ↓ Pass-through of CCP to OTC repo rates
- ▶ 1 + 2 jointly ↓ pass-through of DFR to OTC repo rates
- ▶ Cross-sectional predictions on monetary policy pass-through
 - ▶ Empirically verified with the Sep 2020 Deposit Facility Rate cut

Counterfactual I : Extend CCP Access

- ▶ OTC pass-through efficiency improved by 20% to 28%



- ▶ Effects

1. Eliminates dealer market power frictions
2. Does not reduce collateral scarcity frictions

Counterfactual II: Reverse Repo Facility (RRP)

- ▶ Provide access to and set policy rates on a secured deposit facility
- ▶ Similar to the Fed's RRP Facility
- ▶ Effects
 1. Reduces collateral scarcity frictions
 2. Alleviates dealer market power frictions

Contribution

1. Repo markets

- ▶ Repo specialness in the Euro-area: Buraschi and Menini 02, Ferrari et al 17, Corradin and Maddaloni 20, Arrata et al. 20, Brand et al. 20, Ballensiefen et al. 20
- ▶ Collateral scarcity: Duffie 96, Fisher 02, Bottazzi et al. 12, Huh and Infante 18, Roh 19
- ▶ **We shed light on the OTC repo market and identify market power as a key friction → joint framework of market power and collateral scarcity**

2. Pass-through efficiency of monetary policy

- ▶ Bech and Klee 11, Bech et al. 12, Duffie and Krishnamurthy 16
- ▶ **We show how dealer market power reduces pass-through efficiency and increases pass-through dispersion using transaction-level data → policy counterfactuals**

Roadmap

1. Facts
2. Model
3. Empirical Tests
4. Policy Counterfactuals

Money Market Statistical Reporting (MMSR)

- ▶ First micro-data on OTC repo markets in the Euro-area
- ▶ Transaction-level data of CCP and OTC repos by 38 major dealer banks in the European money market

Our sample of repos

- ▶ Backed by German, French, Italian, and Spanish gov collateral
- ▶ Special collateral repos for O/N, S/N, T/N segments
- ▶ From March 2017 to March 2020

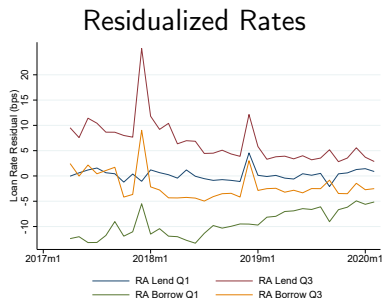
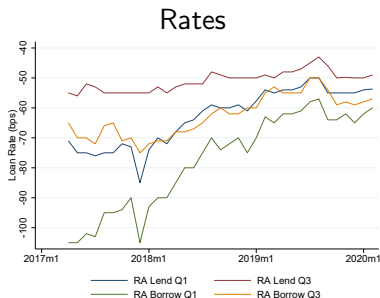
Stylized Facts

1. Customers rely on concentrated repo intermediation by dealers
 - ▶ median no. of dealers for an OTC customer: 1
 - ▶ 75th pct no. of dealers for an OTC customer: 2
2. Dealers earn high net interest margins for intermediating repos
 - ▶ Dealer net interest margins: 6.3-14.2 bps
3. There is significant rate dispersion for repos that cannot be explained by differences in collateral and loan terms

Stylized Facts

Repos backed by German government collateral:

- ▶ Interquartile range of repo rates: 14.2 and 12.1 bps
- ▶ Residualize rates on loan terms and ISIN-level collateral
- ▶ Interquartile range of residualized rates: 10.4 and 8.5 bps



Roadmap

1. Facts
2. **Conceptual Framework**
3. Empirical Tests
4. Policy Counterfactuals

Set-Up

- ▶ Central bank sets the unsecured DFR ρ
- ▶ Dealers
 - ▶ Have access to the unsecured DFR ρ
 - ▶ Have access to competitive inter-dealer market for repos r_{ID}
 - ▶ Derive value from collateral in repos so $r_{ID} < \rho$
- ▶ Customers
 - ▶ No direct access to inter-dealer market
 - ▶ Rely on dealer intermediation + bargain over repo loan rate
 - ▶ Rate for depositors with value v_D and bargaining power $1 - \theta_D$

$$r_D = r_{ID} - \theta_D(r_{ID} - v_D)$$

- ▶ Rate for borrowers with value v_B and bargaining power $1 - \theta_B$

$$r_B = r_{ID} + \theta_B(v_B - v_{ID})$$

Results

- ▶ Pass-through is impeded by collateral scarcity and market power frictions
- ▶ DFR to OTC pass-throughs are

$$\frac{dr_D}{d\rho} = \frac{dr_{ID}}{d\rho} \frac{dr_D}{dr_{ID}} = \underbrace{\frac{dr_{ID}}{d\rho}}_{\text{collateral scarcity}} \underbrace{(1 - \theta_D)}_{\text{market power}}$$

$$\frac{dr_B}{d\rho} = \frac{dr_{ID}}{d\rho} \frac{dr_B}{dr_{ID}} = \underbrace{\frac{dr_{ID}}{d\rho}}_{\text{collateral scarcity}} \underbrace{(1 - \theta_B)}_{\text{market power}}$$

Testable Predictions

Prediction I

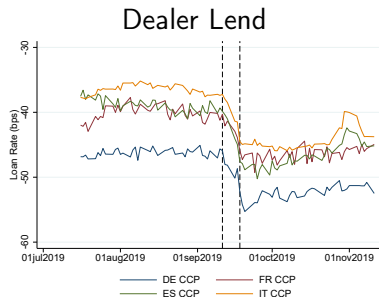
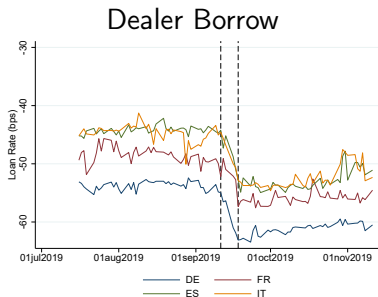
Across collateral types, higher rate dispersion \rightarrow lower CCP-OTC pass-through.

Prediction II

Across OTC customers for a given collateral type, repo borrowers (depositors) who have ex-ante higher (lower) rates \rightarrow lower pass-through

Estimating Pass-through

- ▶ September 2020: Deposit Facility Rate cut from -40 to -50 bps



Estimating Pass-through

- ▶ For repos backed by a given collateral, we can estimate

$$Passthrough_i^{DFR_CCP} = \frac{rate_{i,CCP,post} - rate_{i,CCP,pre}}{-10}$$

$$Passthrough_i^{DFR_OTC} = \frac{rate_{i,OTC,post} - rate_{i,OTC,pre}}{-10}$$

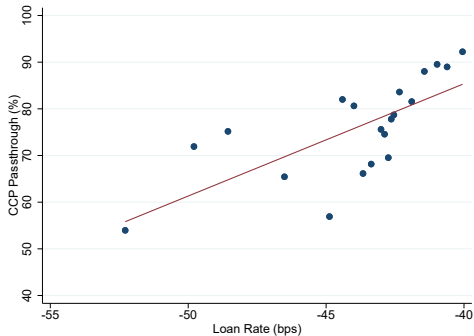
$$Passthrough_i^{CCP_OTC} = \frac{Passthrough_i^{DFR_OTC}}{Passthrough_i^{DFR_CCP}}$$

- ▶ Similarly, we can estimate pass-through by OTC counterparty

DFR to CCP Pass-through

- ▶ DRF to CCP Pass-through across collateral ISINs varies with collateral scarcity

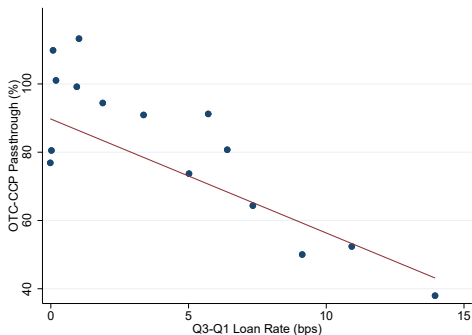
E.g. French Collateral



OTC Pass-through and OTC Rate Dispersion

- ▶ CCP to OTC Pass-through within collateral ISINs varies with dealer market power
- ▶ Model Prediction:
 - ▶ \uparrow OTC rate dispersion \rightarrow \downarrow CCP to OTC Pass-through

E.g. French Collateral



OTC Pass-through and OTC Rates

▶ Model Prediction:

- ▶ \uparrow OTC dealer borrow rate \rightarrow \uparrow OTC Pass-through
- ▶ \uparrow OTC dealer lend rate \rightarrow \downarrow OTC Pass-through

	Dealer Borrow		Dealer Lend	
Loan Rate	2.396*** [0.515]	1.585*** [0.495]	-0.903*** [0.239]	-0.640** [0.292]
Constant	161.874*** [27.503]	117.651*** [26.512]	33.477*** [10.853]	43.250*** [12.604]
Cntp Country	Yes	Yes	Yes	Yes
Cntp Sector	No	Yes	No	Yes
Observations	324	323	173	173
Adj. R-squared	0.840	0.862	0.306	0.307

▶ Robust to using residualized rates

Roadmap

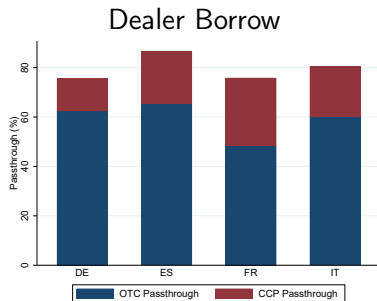
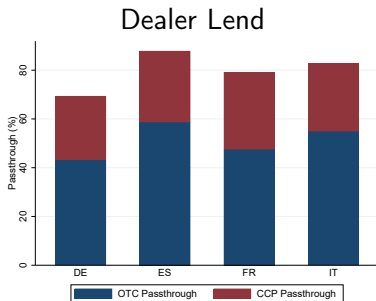
1. Facts
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4. **Policy Counterfactuals**

Counterfactual I : Extend CCP Access

- ▶ Model Prediction
 - ▶ Eliminates dealer market power frictions
 - ▶ Does not reduce collateral scarcity frictions
- ▶ Estimate counterfactual OTC pass-through
 1. For each OTC trade, match the CCP pass-through for repos backed by the same collateral and of the same terms
 2. Calculate new pass-through efficiency (weighted average)
 3. Calculate new pass-through dispersion (weighted sd)

Counterfactual I: Extend CCP Access

- ▶ OTC pass-through efficiency improved by 20% to 28%



Counterfactual I: Extend CCP Access

- ▶ OTC pass-through dispersion reduced by 8% to 28%

Collateral Segment	Dealer Borrow	
	Without Access	With Access
DE	22.4	13.6
ES	31.7	23.8
FR	41.9	13.8
IT	30.2	9.1

Collateral Segment	Dealer Lend	
	Without Access	With Access
DE	36.4	18.5
ES	29.3	20.9
FR	36.3	19.9
IT	30.9	8.3

Counterfactual II: Reverse Repo Facility (RRP)

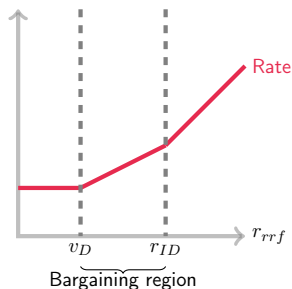
Provide access to and set policy rates on a secured deposit facility

- ▶ Similar to the Fed's RRP Facility
- ▶ Model Prediction
 - ▶ Reduces collateral scarcity frictions
 - ▶ Provides a floor on repo rates
 - ▶ Alleviates dealer market power frictions
 - ▶ Even when floor is not binding and there is no uptake

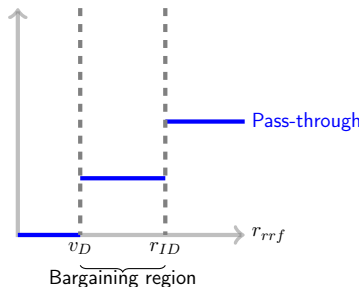
Counterfactual II: Reverse Repo Facility (RRP)

- ▶ When $r_{RRP} > r_{ID}$:
 - ▶ Rate floor is binding \rightarrow pass-through is efficient
- ▶ When $v_B < r_{RRP} < r_{ID}$:
 - ▶ Improve bargaining outside option \rightarrow pass-through is improved

OTC Market Rate



OTC Market Pass-through



Conclusion

1. Significant market power frictions in OTC repo markets
2. Joint framework of market power and collateral scarcity
 - ▶ DFR to CCP repo rate pass-through: collateral scarcity
 - ▶ DFR to OTC repo rate pass-through: collateral scarcity + market power
3. Policy counterfactuals to improve pass-through
 - ▶ CCP access: \downarrow market power
 - ▶ RRP Facility: \downarrow market power + \downarrow collateral scarcity