Monetary Policy Transmission in Segmented Markets

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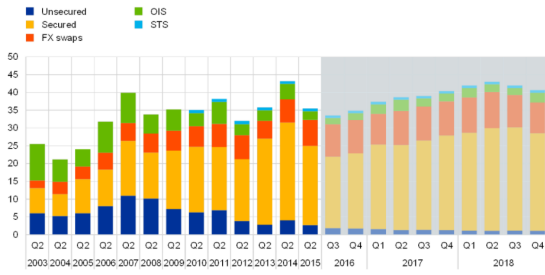
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The Repo Market

▶ Money markets are the first stage of monetary policy transmission

▶ Repos are now the predominant form of short-term funding
  ▶ Euro-area: EUR 500 billion daily turnover (ECB, 2018)
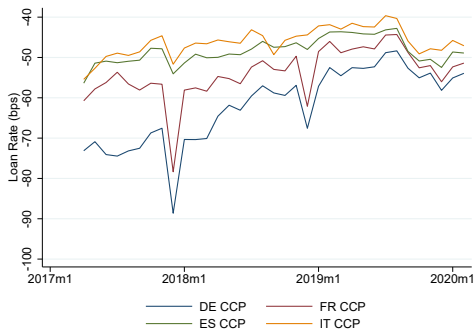 ▶ US: $3 trillion outstanding in 2018 (Baklanova et al, 2019)

Market share of the cumulative volume per quarter per segment

Existing Literature

▶ Existing literature: rate dispersion across collateral due to collateral scarcity

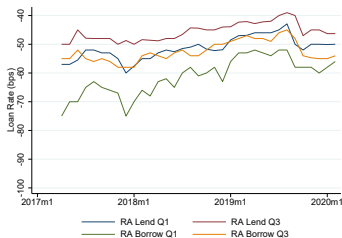

Rates across collateral

This Paper

▶ Significant rate dispersion for repos with the same collateral and loan terms due to dealer market power
  ▶ E.g., weighted sd for French collateral repos: 10.4 bps
▶ Dealer market power lowers the passthrough efficiency of monetary policy
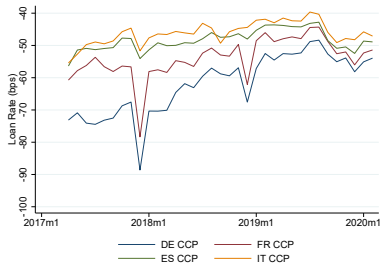
Rates across collateral

French rate distribution

Reason: OTC Repo Market

▶ Existing literature only looks at centrally cleared repos on e-trading platforms (CCP market)

    ▶ Mostly an inter-dealer market

▶ The majority of market participants only have access to the OTC repo market

    ▶ e.g. Money market funds, mutual funds, pension funds, insurance companies

    ▶ The OTC repo market is significant in size

        ▶ Euro-area: 30% of repo volume (ECB, 2018)

        ▶ US bilateral repos: 50% of repo volume (Baklanova et al., 2019)

    ▶ Lack of data $\rightarrow$ unexplored

Our Approach

▶ We use the ECB's new MMSR data to study OTC repo markets jointly with CCP repo markets

Stylized Facts

▶ Preliminary evidence for dealer market power

Model

▶ Core-periphery OTC model decomposing pass-through frictions:

  ▶ **Collateral scarcity** ↓ policy rate to inter-dealer pass-through
  ▶ **Market power** ↓ inter-dealer to OTC pass-through

Our Approach

Empirical tests using 2019 monetary policy rate cut
- ▶ September 2019: Deposit Facility Rate cut from -40 to -50 bps
- ▶ Confirm model predictions: pass-through is lower in segments with higher dispersion, worse rates

Dealer borrow rates
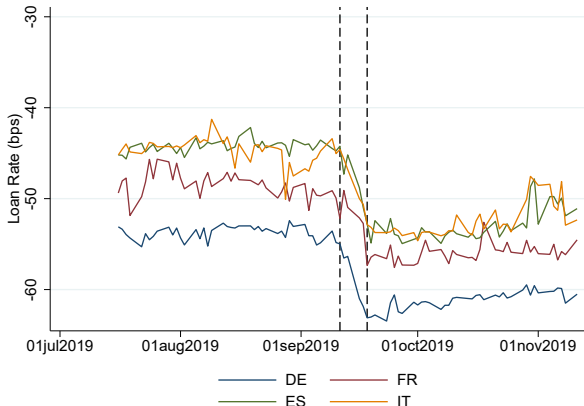
Policy Implications

Platform access

▶ Customer access to inter-dealer platforms reduces effective
   dealer market power

▶ Pass-through efficiency would improve by 26% to 39%

▶ Pass-through dispersion would decrease by 8% to 26%

Access to the Reverse Repo Facility (RRP)

▶ i.e., a secured deposit facility with the central bank for
   non-banks

▶ Provides an outside option for market participants

▶ Can alleviate both collateral scarcity and market power frictions

Related literature

- **Money market frictions and policy rate pass-through:** Bech & Klee (2011), Bech, Copeland, Duffie, and Yang (2021), Klee, & Stebunovs (2012), Duffie & Krishnamurthy (2016)

- **European repo markets:** Buraschi & Menini (2002), Mancini, Ranaldo, & Wrampelmeyer (2015), Boissel, Derrien, Ors, & Thesmar (2017), Ferrari, Guagliano & Mazzacurati (2017), Brand, Ferrante & Hubert (2019), Ranaldo, Schaffner, & Vasios (2019), Corradin & Maddaloni (2020), Arrata, Nguyen, Rahmouni-Rousseau, & Vari (2020), Ballansiefen, Ranaldo, & Winterberg (2020), Corradin & Maddaloni (2020)

- **US repo markets:** Copeland, Martin, & Walker (2014), Martin, Skeie, & Thadden (2014), Anbil, Anderson, & Senyuz (2020), Correa, Du, & Liao (2021), Anderson, Du, & Schlusche (2021)

Outline

1. Data
2. Stylized facts
3. Model
4. Empirical Tests
5. Policy Counterfactuals

Data

Money Market Statistical Reporting (MMSR) dataset

▶ Transaction-level data on all CCP and OTC repo transactions made by 38 major dealer banks in the European money market

▶ First micro-data on Euro OTC repo markets

▶ Observe date, collateral ISIN, rate, maturity, haircut, dealer ID, counterparty sector + location, counterparty ID

Sample:

▶ Repos backed by German, French, Italian, Spanish govt bonds

▶ February 2017 to February 2020

Stylized Facts

▶ 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
 ▶ Better rates for customers with larger volumes, and more connections

	RA Borrow	RA Borrow	RA Lend	RA Lend
Bilateral Loan Volume	0.962***	0.812***	-0.855***	-0.736**
	[0.241]	[0.243]	[0.311]	[0.307]
Total Loan Volume	-0.090**	-0.073**	0.205***	0.203***
	[0.036]	[0.036]	[0.029]	[0.029]
Number of RAs	0.515**	0.437*	-1.045***	-0.798***
	[0.232]	[0.232]	[0.219]	[0.219]
Sector FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
RA FE	No	Yes	No	Yes
Observations	3947	3942	4160	4155
Adj. R-squared	0.101	0.162	0.099	0.147

Stylized Facts

1. Dealers earn high net interest margins for intermediating repos
   - ▶ e.g. French collateral repos: 11.4 bps

2. Substantial repo rate dispersion for different market participants
   - ▶ e.g. weighted sd for French collateral repos: 10.4 bps
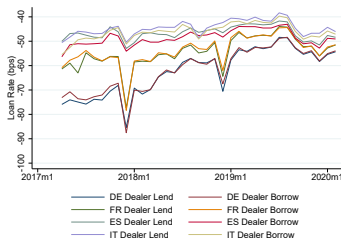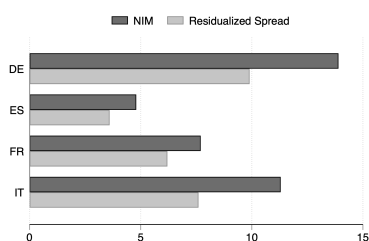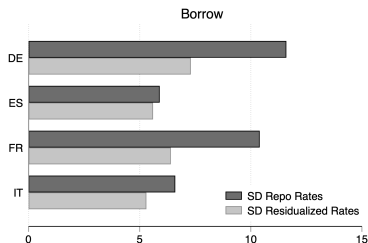

Rates across collateral
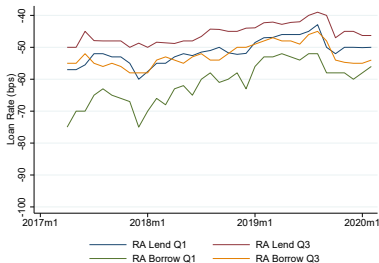
French rate distribution

Stylized Facts

Observations not explained by differences in collateral and loan terms!

▶ Residualize rates on loan terms and ISIN-level collateral
▶ Substantial net interest margins and standard deviations remain

Net Interest Margins

Weighted SD (Dealer Borrow)

Model Set-Up

▶ Central bank sets the unsecured policy rate ρ

▶ Dealers
  ▶ Have access to competitive inter-dealer market for repos r_{ID}
  ▶ Derive value from collateral in repos so $r_{ID} < \rho$

▶ Customers
  ▶ Rely on dealer intermediation + bargain over repo loan rate
  ▶ Rate for depositors with value v_D and bargaining power $1 - \theta_D$

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

Model Results

▶ Pass-through is impeded by collateral scarcity and market power frictions

▶ DFR to OTC pass-throughs are

$$\frac{\mathrm{d}r_\mathrm{D}}{\mathrm{d}\rho} = \frac{\mathrm{d}r_\mathrm{ID}}{\mathrm{d}\rho} \frac{\mathrm{d}r_\mathrm{D}}{\mathrm{d}r_\mathrm{ID}} = \underbrace{\frac{\mathrm{d}r_\mathrm{ID}}{\mathrm{d}r_\rho}}_{\text{collateral scarcity}} \underbrace{(1 - \theta_\mathrm{D})}_{\text{market power}}$$

Model Results

Prediction I

*Across collateral types, higher rate dispersion $\rightarrow$ lower 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 Monetary Policy Pass-through

To test model predictions on passthrough:

▶ September 2019: Deposit Facility Rate cut from -40 to -50 bps

Dealer borrow rates
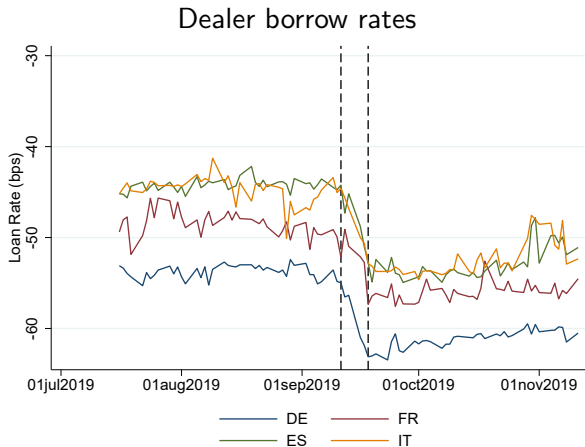
Estimating Monetary Policy Pass-through

Pass-through decomposition:

$$\frac{dr_D}{d\rho} = \underbrace{\frac{dr_{CCP}}{d\rho}}_{\text{Collateral scarcity}} \underbrace{\frac{dr_D}{dr_{CCP}}}_{\text{Market power}}$$

In the data:

$$\frac{dr_D}{d\rho} = \text{Passthrough}_i^{\text{DFR\_OTC}} = \frac{\text{rate}_{i,\text{OTC,post}} - \text{rate}_{i,\text{OTC,pre}}}{-10}$$

$$\frac{dr_D}{dr_{CCP}} = \text{Passthrough}_i^{\text{CCP\_OTC}} = \frac{\text{Passthrough}_i^{\text{DFR\_OTC}}}{\text{Passthrough}_i^{\text{DFR\_CCP}}}$$

Pass-through and Rate Dispersion

Prediction I: Across collateral types, higher rate dispersion $\rightarrow$ lower CCP-OTC pass-through
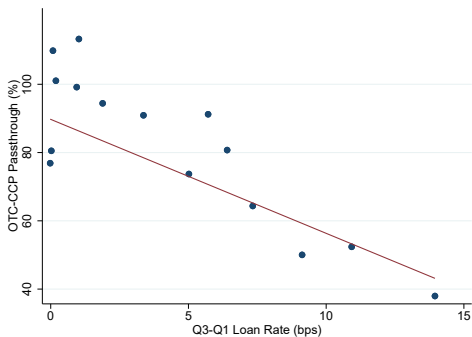
French Collateral

Pass-through and OTC Rate Dispersion

Prediction I: Across collateral types, higher rate dispersion $\rightarrow$ lower CCP-OTC pass-through

$$\text{Passthrough}_i^{\text{DFR\_OTC}} = \alpha + \beta \text{p75-p25 Loan Rate}_i + \gamma \text{RA Lend}_i + \epsilon_i$$

	(1)	(2)	(3)	(4)
	DE	FR	ES	IT
Dispersion	-1.432*	-2.382***	-1.110	-1.186**
	[0.795]	[0.661]	[0.855]	[0.582]
RA Lend	-22.896***	-0.135	-9.563**	-5.118
	[6.312]	[6.609]	[4.772]	[3.814]
Constant	97.083***	92.771***	96.180***	90.511***
	[5.118]	[5.206]	[3.917]	[3.073]
Observations	107	117	103	183
Adj. R-squared	0.11	0.09	0.03	0.02

OTC Pass-through and OTC Rates

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

$$\text{Passthrough}_{jc}^{\text{DFR\_OTC}} = \alpha + \beta \text{Rate}_{jc} + \gamma \text{FR}_j + \theta \text{IT}_j + \delta \text{ESs}_j + \epsilon_{jc}$$

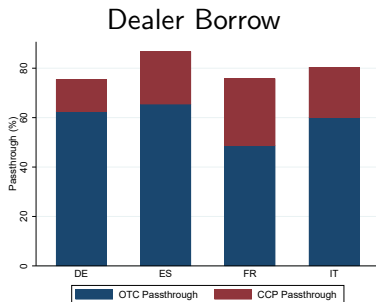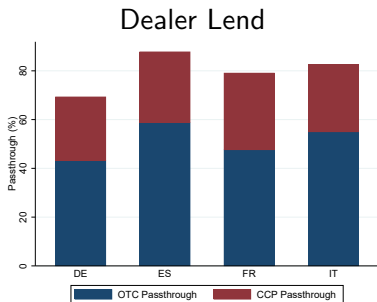| | OTC Passthrough | | | |
	Dealer Borrow		Dealer Lend	
Loan Rate	7.293***	2.809***	-0.930***	-0.659**
	[0.354]	[0.359]	[0.239]	[0.291]
Constant	423.508***	180.534***	33.076***	43.251***
	[18.493]	[19.096]	[10.827]	[12.584]
Cntp Country	Yes	Yes	Yes	Yes
Cntp Sector	No	Yes	No	Yes
Observations	422	422	183	183
Adj. R-squared	0.873	0.931	0.334	0.334

▶ Robust to using residualized rates

Outline

1. Stylized facts
2. Model
3. Empirical Tests
4. Policy Counterfactuals

Counterfactual I: Platform 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: Platform access

▶ Mean pass-through efficiency improved by 26% to 39%

Counterfactual I: Platform access

▶ OTC pass-through dispersion reduced by 8% to 26%

| | Dealer Borrow | |
Collateral Segment	Without Access	With Access
DE	24.5	13.6
ES	30.6	23.8
FR	41.7	14.9
IT	30.1	9.4

| | Dealer Lend | |
Collateral Segment	Without Access	With Access
DE	36.5	19.6
ES	30.1	23.4
FR	37.5	23.0
IT	31.2	13.6

Counterfactual II: RRP facility

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

- ▶ Similar to the Fed's RRP Facility
- ▶ 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
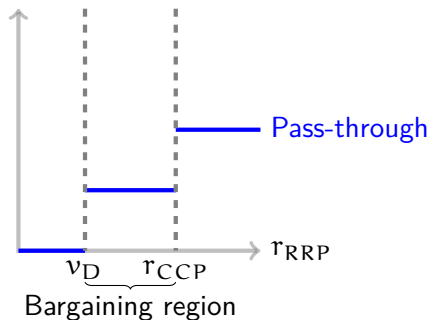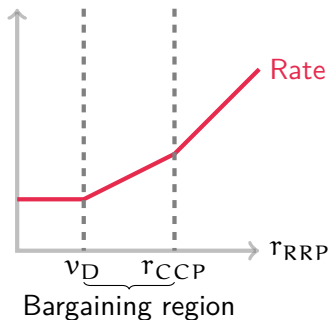
Conclusion

1. Significant market power frictions in OTC repo markets that impede monetary policy transmission

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