Outages in Sovereign Bond Markets

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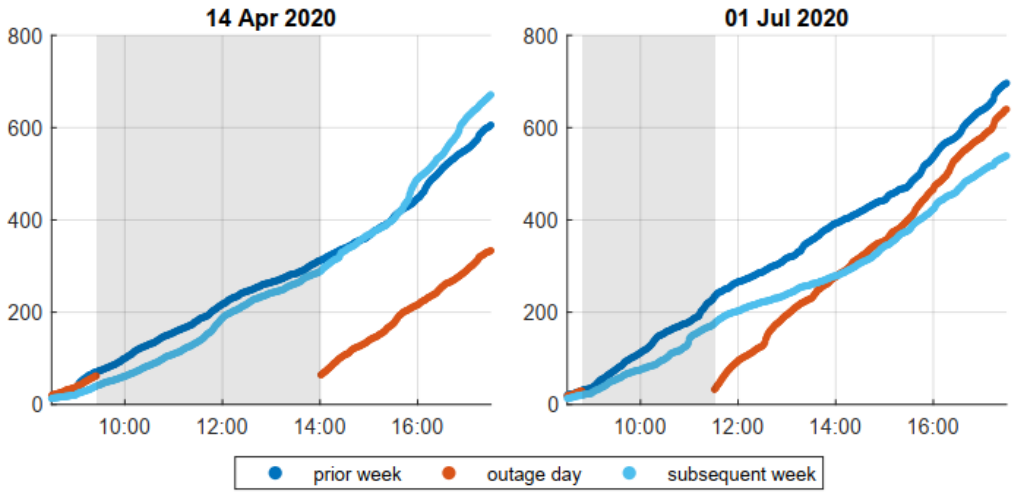
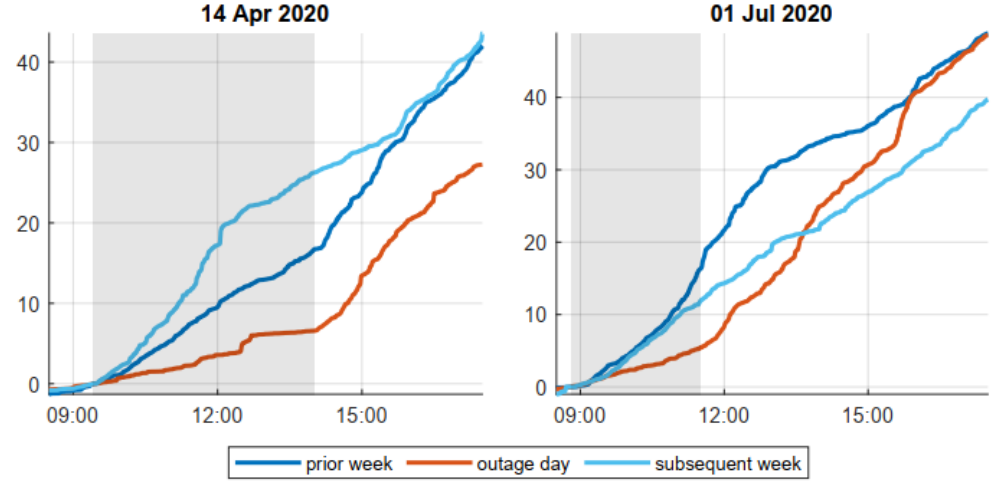
The Paper

- This paper studies the impact of **sovereign bond market outages** on their quality.
- When the futures market is unavailable, volume in the cash market plummets, together with book depth.
- Pricing errors increase significantly, especially for trades between/with customers.
- Markup suggest liquidity insensitive/impatient buyers pay up, patient investors on the flip side.
- Impact of outages in the cash bond market not nearly as impactful.





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	(1) Average	(2) Maturities
Outage	-3.10*** [0.56]	
Outage × <2.5y		-1.07** [0.35]
Outage × 2.5-5.5y		-3.69*** [0.47]
Outage × 5.5-10.5y		-3.81*** [0.64]
Outage × >10.5y		-3.83** [1.01]
Outage × DE		
Outage × FR		
Outage × IT		
Outage × ES		
FE Day	✓	✓
FE Time	✓	✓
FE Country	✓	✓
FE Maturity Bucket	✓	
Observations	1440	1440
Adjusted R^2	0.324	0.335

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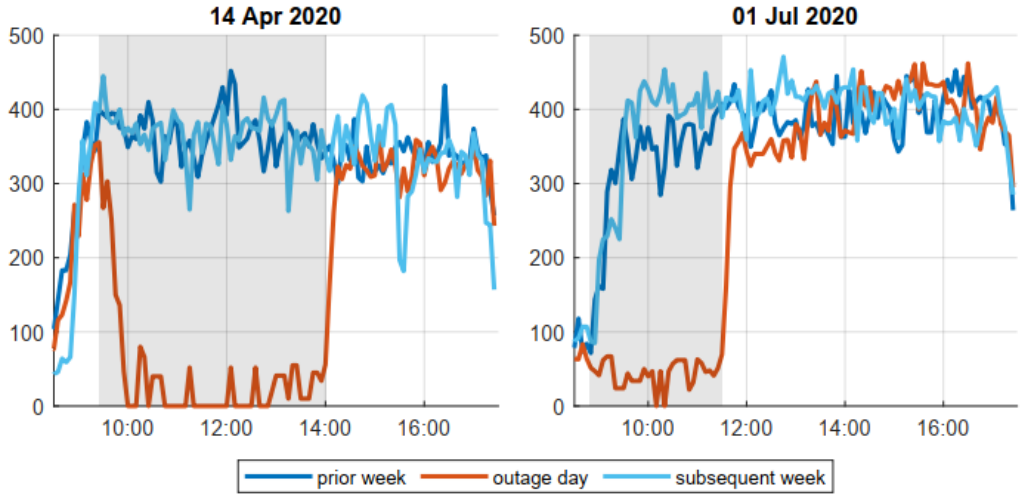

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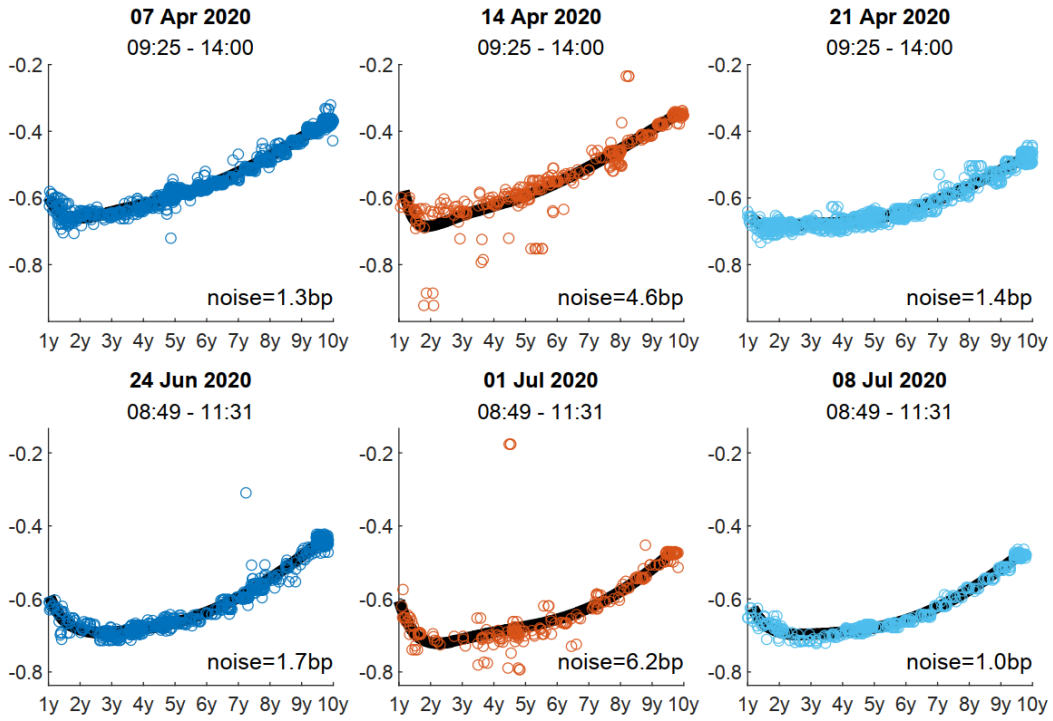

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	Baseline		
	(1) Venue	(2) Segment	(3) Eurex
Outage × OTC bilateral	1.97***		
	[0.40]		
Outage × OTC via IDB	0.14		
	[0.28]		
Outage × OTC via SI	0.17		
	[0.25]		
Outage × electronic platforms	0.91***		
	[0.17]		
Outage × regular exchange	4.46***		
	[0.97]		
Outage × C2C		3.34***	
		[0.20]	
Outage × D2C		0.72***	
		[0.13]	
Outage × D2D		0.35	
		[0.36]	
Outage × none			2.88***
			[0.32]
Outage × one			1.33***
			[0.17]
Outage × both			0.49*
			[0.20]
Outage × log(Volume)			
FE Minute	✓	✓	✓
FE ISIN	✓	✓	✓
Observations	3038	3214	3070
Adjusted R^2	0.166	0.164	0.147

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	(1) absolute mispricing	(2) markup	(3) profit
Outage × Bank Dealer	0.61*** [0.12]	0.17* [0.08]	1.52** [0.42]
Outage × Bank Non-Dealer	1.90*** [0.14]	0.64 [0.50]	-1.31* [0.60]
Outage × NBFI	1.24** [0.38]	0.47** [0.16]	0.91 [0.49]
Outage × Investment Fund	0.44** [0.14]	-0.59*** [0.08]	-2.61 [1.33]
Outage × Hedge Fund	2.62*** [0.31]	2.75*** [0.43]	1.53 [1.75]
Outage × ICPF	0.27 [0.41]	-0.52*** [0.11]	-5.85* [2.73]
Outage × NFC	1.78 [1.64]	-1.29 [2.14]	-1.14 [2.50]
Outage × Official	0.20 [0.13]	-0.30 [0.28]	-3.08 [1.90]
Outage × Household	4.29*** [0.69]	-4.03*** [0.36]	-2.47* [1.17]
FE Minute	✓	✓	✓
FE ISIN	✓	✓	✓
Observations	6083	6083	6083
Adjusted R^2	0.165	0.051	-0.008

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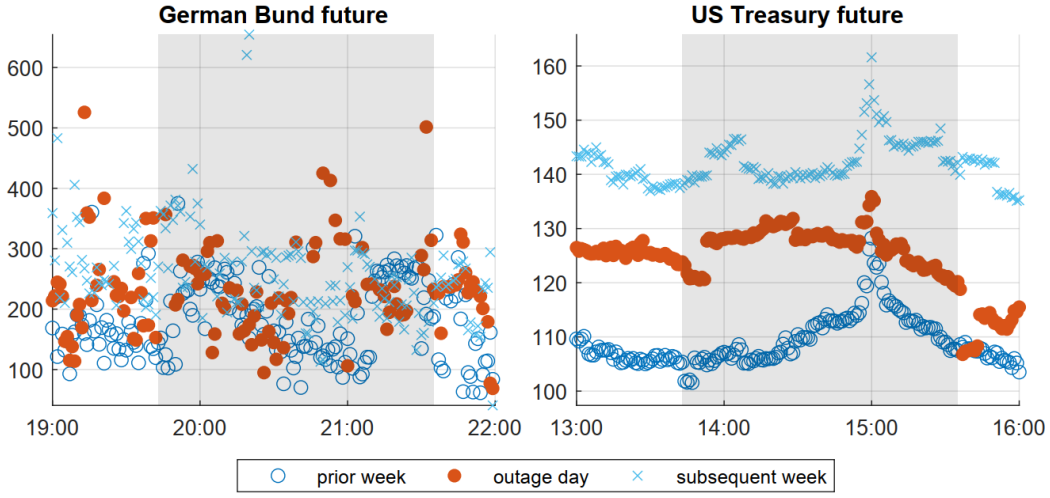

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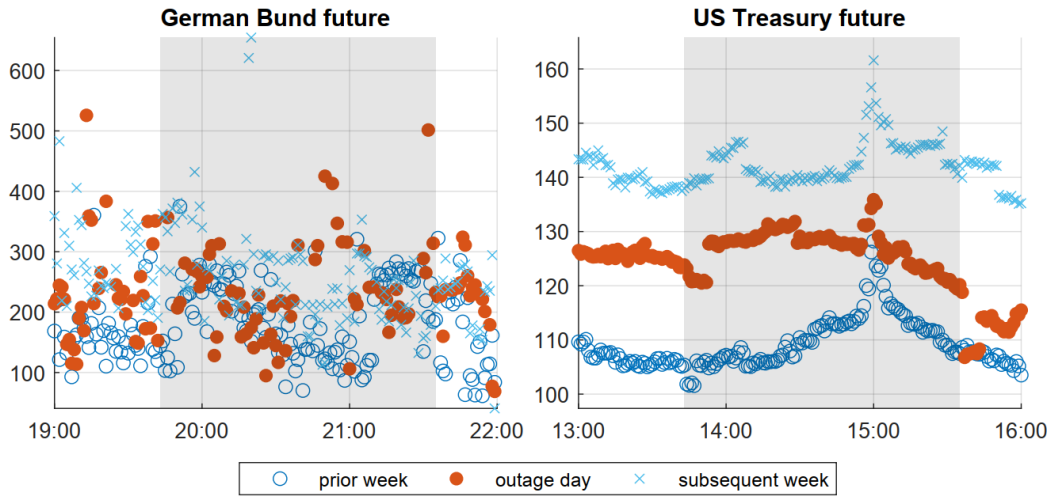


- [P]rice discovery on the euro area fixed-income market hinges on bond futures.
- Without [futures] benchmark, less sophisticated investors commit large pricing errors.

My Questions

1. Is this really a matter of price discovery, or is it one of intermediation?

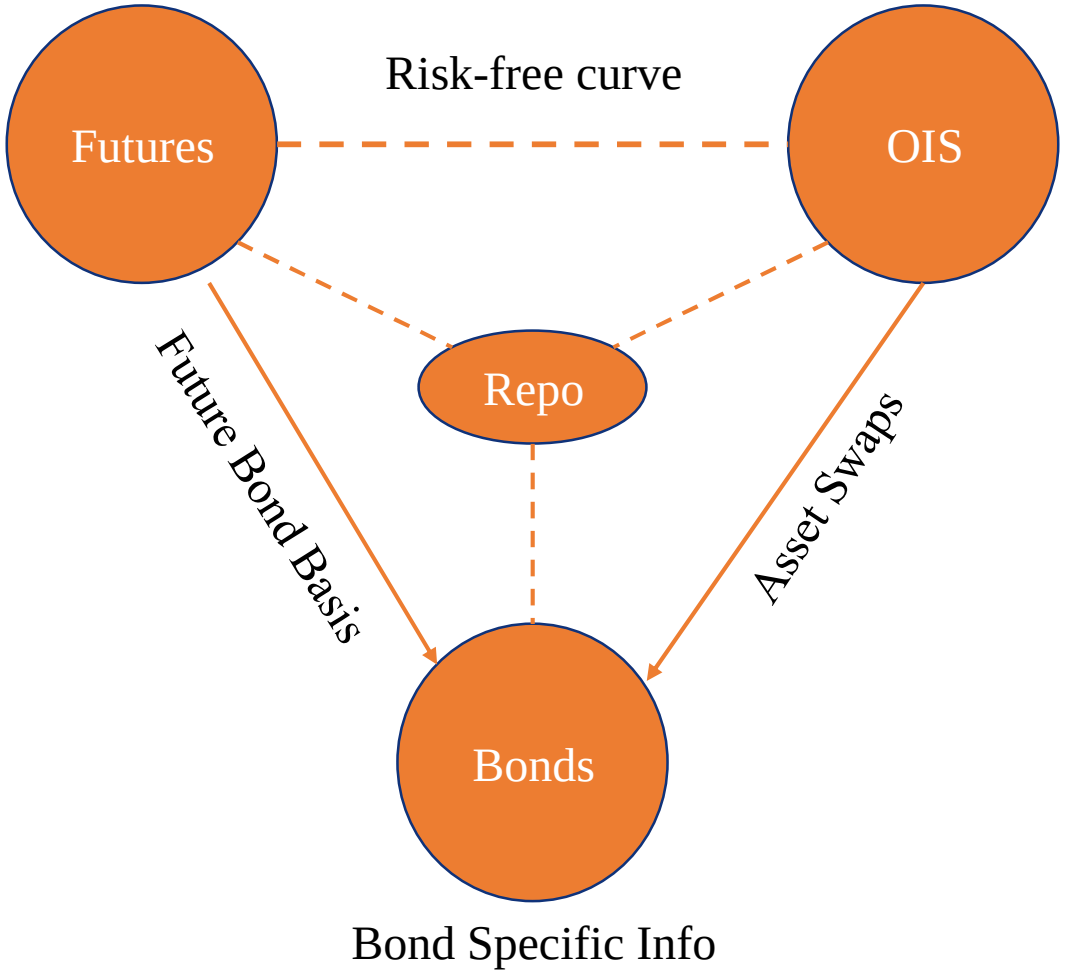
2. What happens to the repo market during the outages?

3. Who is left to trade during outages? Why do they persist?

1
Price discovery or Intermediation?

My prior on price discovery:

- OIS swaps price risk-free curve, futures follow along
- Bond markets provide bond-specific, off-node price discovery
- Repo sits in the middle:
  - OIS and bonds via pricing asset swaps
  - Bonds and futures via arbitrage



1
Price discovery or Intermediation?

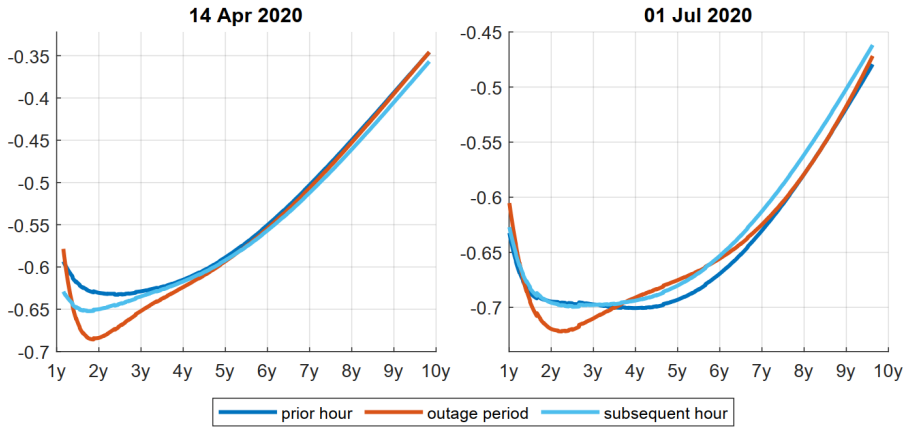
- It makes sense that outages in the futures market have impact, but outages in the bond market do not!
- Well established price discovery is in derivatives.
  - Is it market structure (OTC vs decentralized)?
  - Is it more optimal usage of capital? (CDS vs bonds, option/stock markets split it but conflicting results)
  - Thought experiment: What if there were 90 futures – one per bond – where would price discovery happen?

Table 3: Co-Integration Analysis (continued)

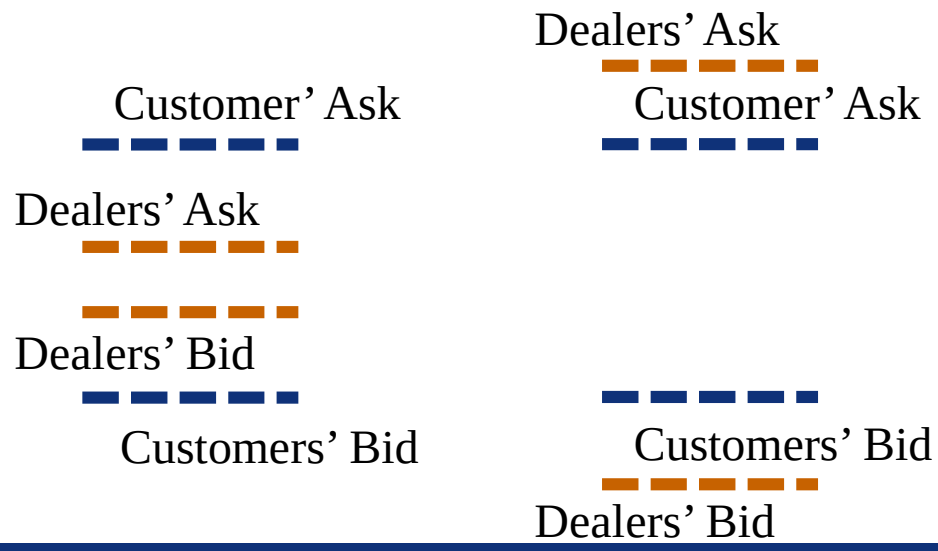
Panel B				
	Five-minute		Daily	
	The β Vector	The α Vector	The β Vector	The α Vector
Futures Price	-1.00268	-0.00016	-1.00506	-0.08478
Bond Price	1	-0.00513	1	-0.19314
Constant	-0.49659		-0.28582	

1
Price discovery or Intermediation?

- Is this paper really about price discovery?
  - During outage, no price discovery, consistent with Hasbrouck's
  - Yield curve is unchanged!
  - Tests are not about price informativeness, but distance from "fair"
- Alternative: Dealers decided to stop market-making
  - Stop trading, midpoint still same, just wide BA spread
  - Lack of hedging instrument made it impossible for a dealers to do its job in the OTC market.



- What you have here, is a perfect setting to probe how market making works in 2020
  - A la Naik Yadav JF2003, currently Muravyev Hu Kirilova 2024
  - Ex-ante heterogeneity in hedging strategies as predictor of behavior during outage.
  - If you want to push the availability of capital story, test whether dealer with more BS move away less than dealers with less BS



2
What Happens to the Repo Market?

The authors ask me to look into how repo markets behaved during outages

- Rule out balance sheet constraints are the issue
- Shed light if bond-future arbitrage was an important driver

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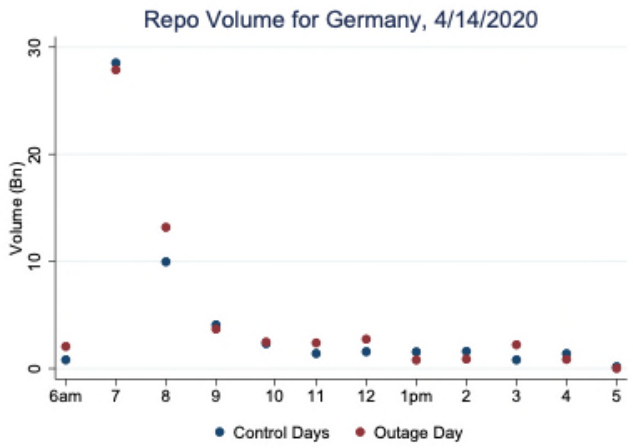
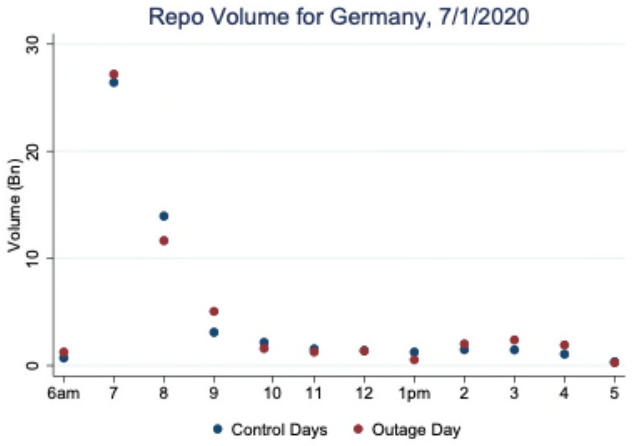
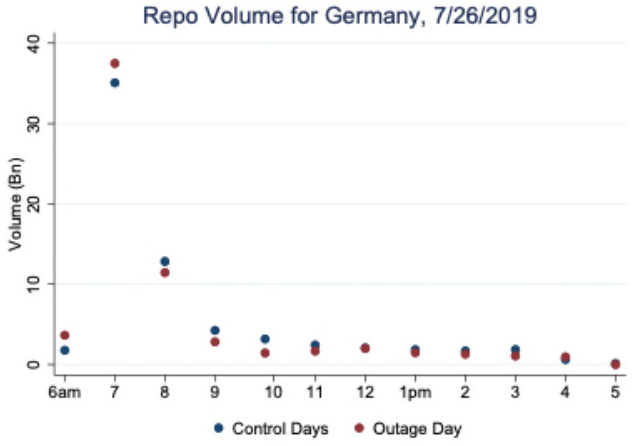
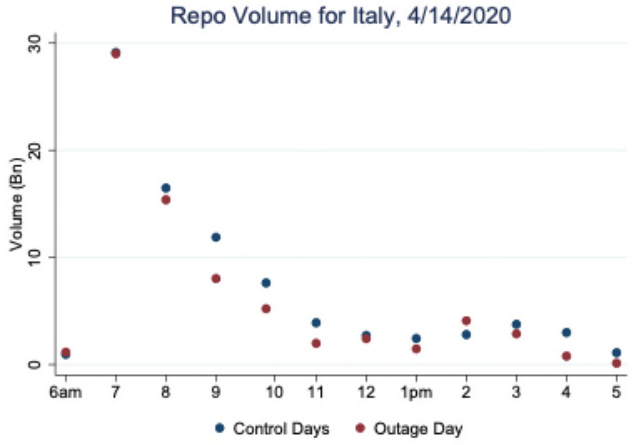
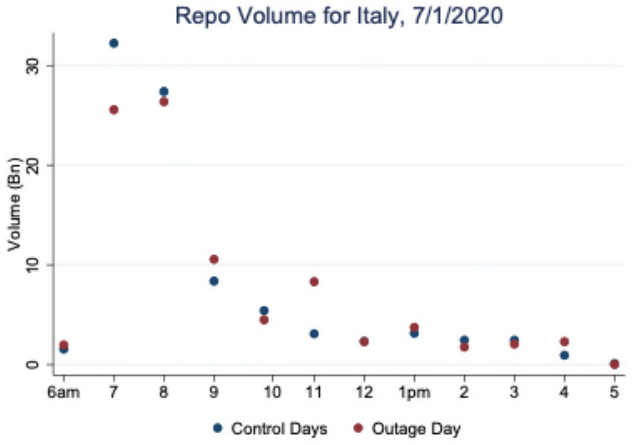
What Happens to the Repo Market?

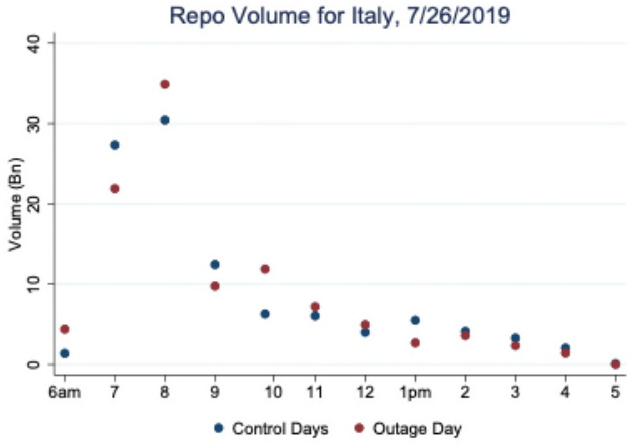












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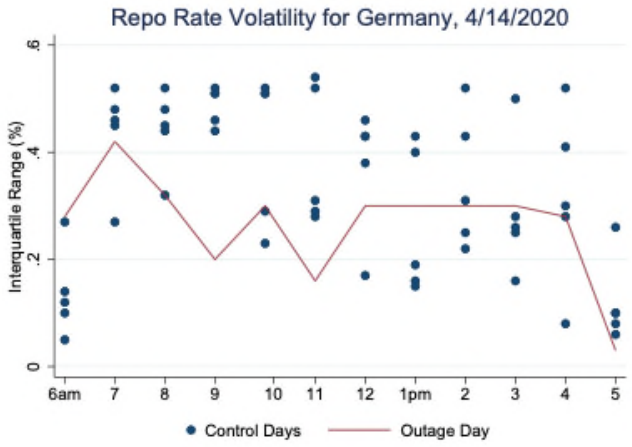

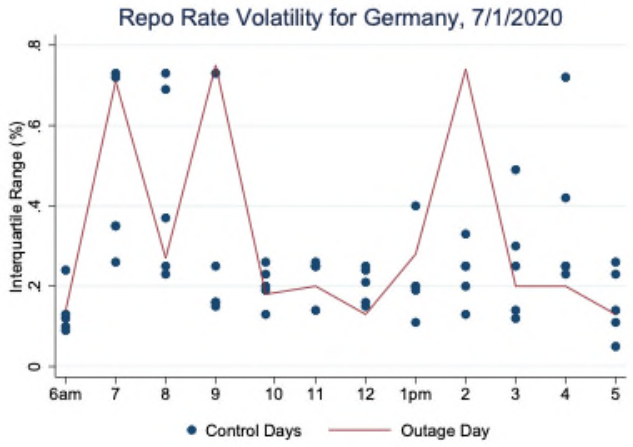

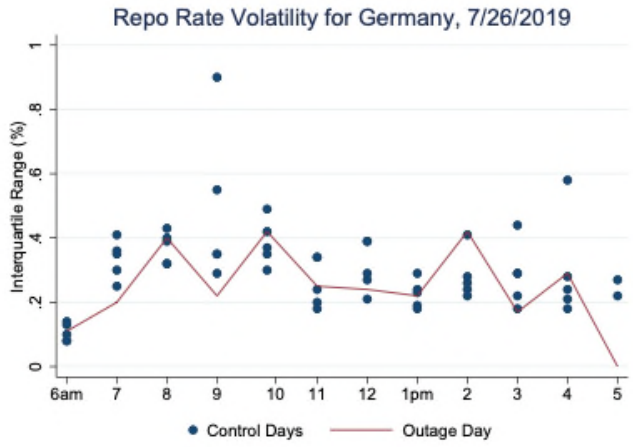

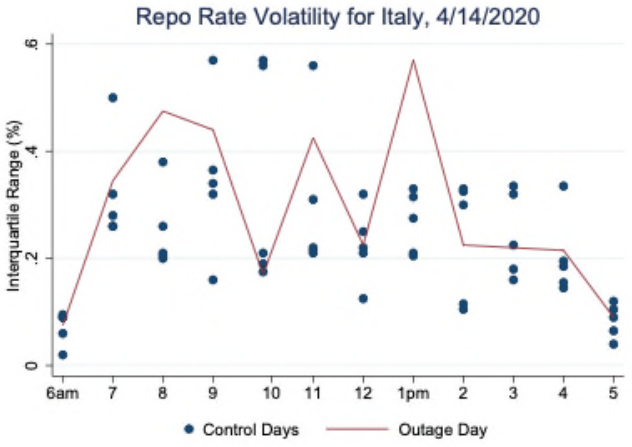

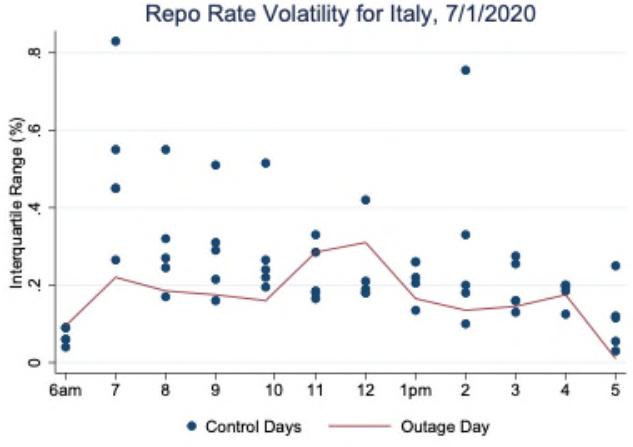

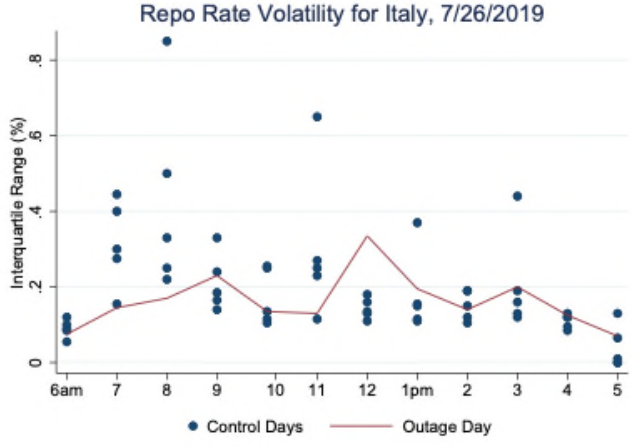

3
Who is Left to Trade During Outages?

- Who is left trading? They want bonds, not exposure.
- Price insensitive? Or do they have better info?
  - Or are they just “dumb”?
- Super interesting to understand why
  - Investment funds
  - Insurance companies
  - Pension funds

  have such need to trade. They know Eurex is down!

	(2) markup
Outage × Bank Dealer	0.17* [0.08]
Outage × Bank Non-Dealer	0.64 [0.50]
Outage × NBFI	0.47** [0.16]
Outage × Investment Fund	-0.59*** [0.08]
Outage × Hedge Fund	2.75*** [0.43]
Outage × ICPF	-0.52*** [0.11]
Outage × NFC	-1.29 [2.14]
Outage × Official	-0.30 [0.28]
Outage × Household	-4.03*** [0.36]
FE Minute	✓
FE ISIN	✓
Observations	6083
Adjusted R^2	0.051

Questions

- Aren’t bund futures traded on ICE as well?
- It’d be interesting to include cash bonds from other countries. When ES futures were not traded, traders used IT as proxies, so you should see the results in, say, AT+BE+… as well
- What about utilization of swaps by dealers? Or any other derivative? If not much, would be nice to show.
- I don’t know how Table 1 column 1 is identified if there day-FEs are included.
- You could use MIFIR to identify dealers on MTS, link their quoting behavior to heterogeneities. I have an idea on how to do this…

Conclusions

- A thought-through, in depth analysis of outages in cash/futures bond markets
- I would love to learn more about:
  - How I should think of price discovery vs. lack of intermediation.
  - What repo market's resilience during outages tells us about the relation across markets.
  - Why some investors persisted despite the lack of liquidity.
- This paper shows futures market are fundamental to the price-discovery process.
- Excited to see the next version!