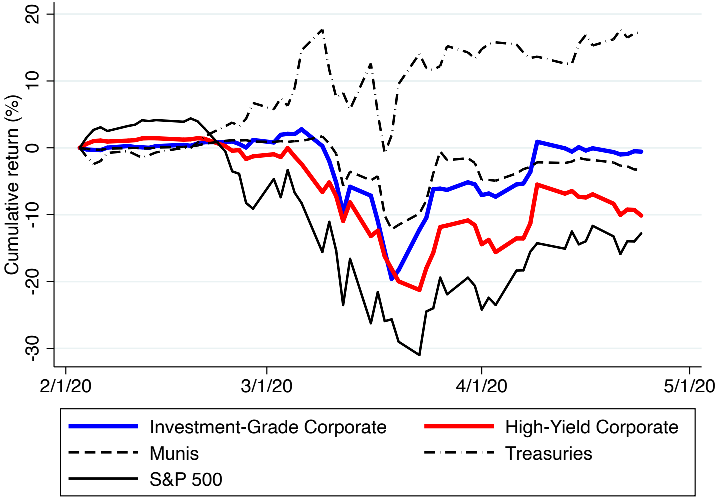
When Selling Becomes Viral: Disruptions in Debt Markets in the COVID-19 Crisis and the Fed's Response

Valentin Haddad
UCLA & NBER

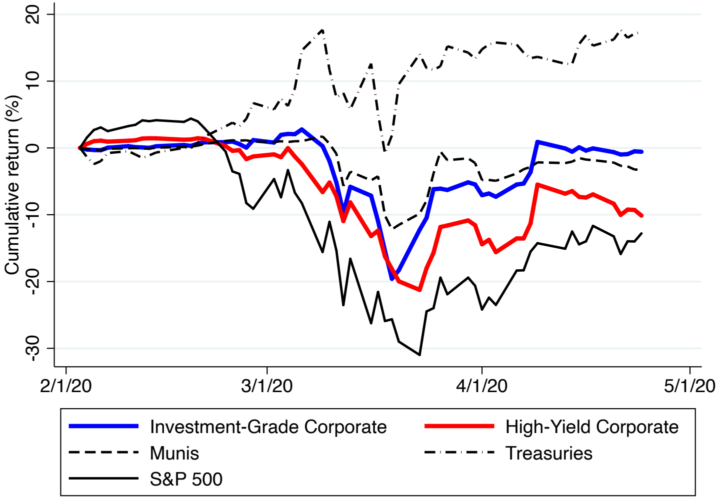
Alan Moreira
University of Rochester

Tyler Muir
UCLA & NBER

Cumulative Returns during COVID-19



Cumulative Returns during COVID-19



- Pre-crisis beta implies a drop for investment-grade corporate of $5\% \ll 20\%$

This Paper

Use the cross-section of debt markets to discipline interpretation of this episode

- Document pervasive dislocations in debt prices, in particular investment-grade debt
  - Discount on *cash-intensive trades*: bonds cheap relative to CDS
  - Discount on *safer and more liquid* trades: ETFs cheap relative to bonds
- Trace recovery back to Fed announcements of bond purchases

This Paper

Use the cross-section of debt markets to discipline interpretation of this episode

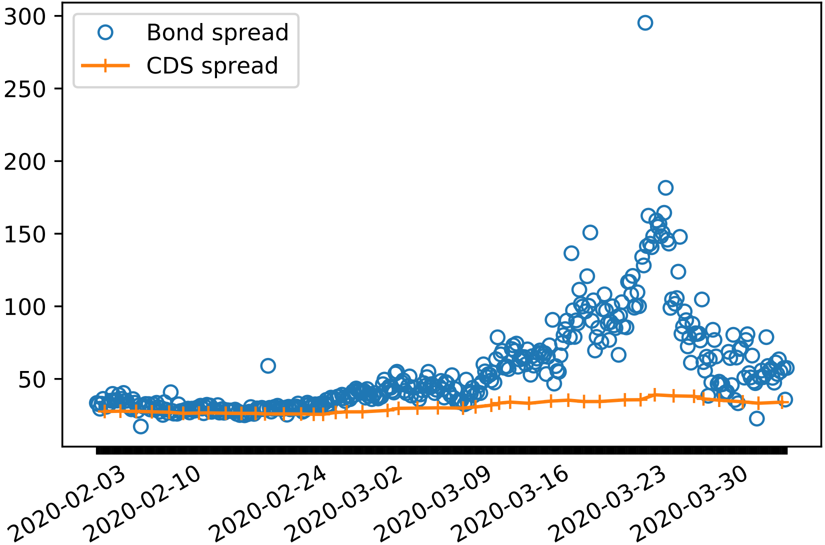
- Document pervasive dislocations in debt prices, in particular investment-grade debt
  - Discount on *cash-intensive trades*: bonds cheap relative to CDS
  - Discount on *safer and more liquid* trades: ETFs cheap relative to bonds
- Trace recovery back to Fed announcements of bond purchases

⟶ Challenges frictionless explanations (cash-flow expectations or risk compensations)

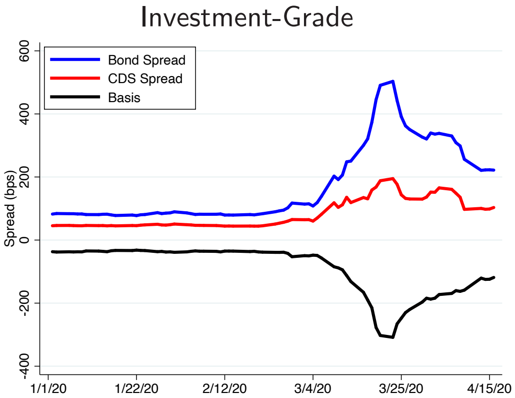
⟶ Challenges dealer-centric view

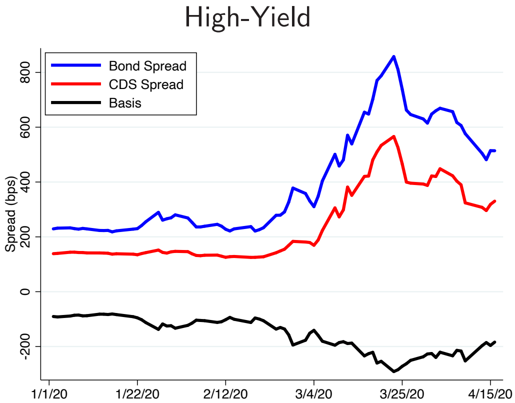
⟶ Most consistent with widespread persistent selling pressure to obtain cash: bond mutual funds, corporations, ...

An Example: 6-year Google Bond

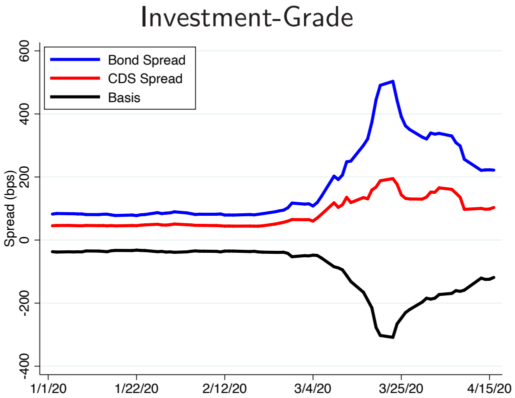


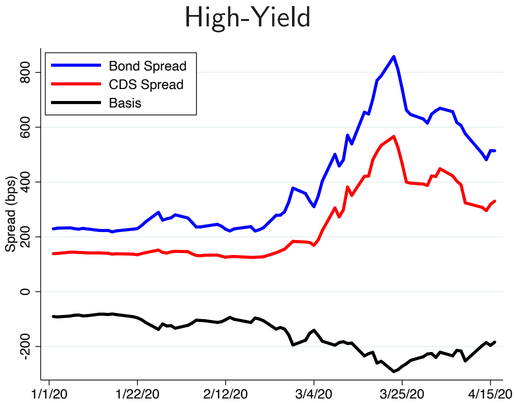
CDS-Bond Basis





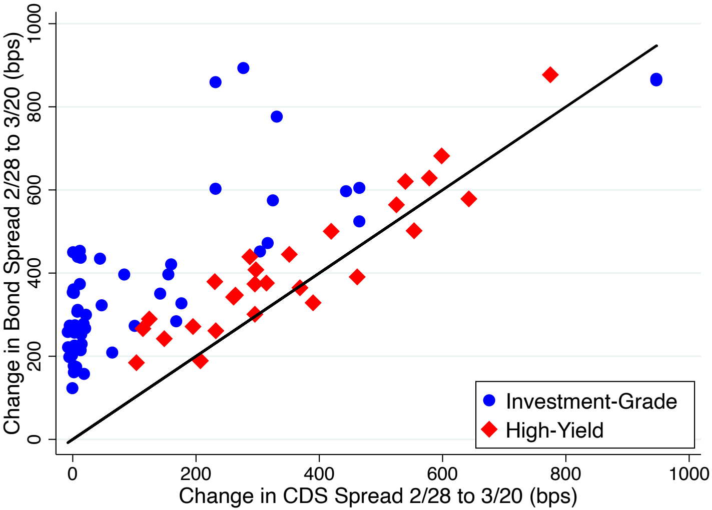
CDS-Bond Basis



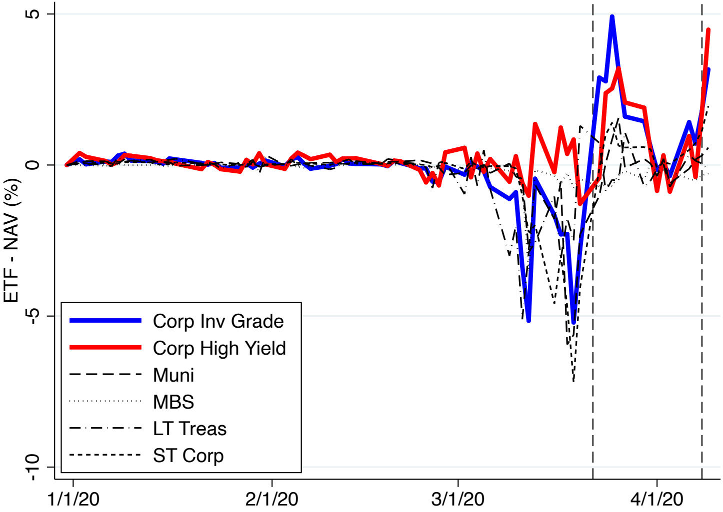


- Synthetic investment-grade (Treasury − CDS) drops by $5\% \ll 20\%$ for actual bonds

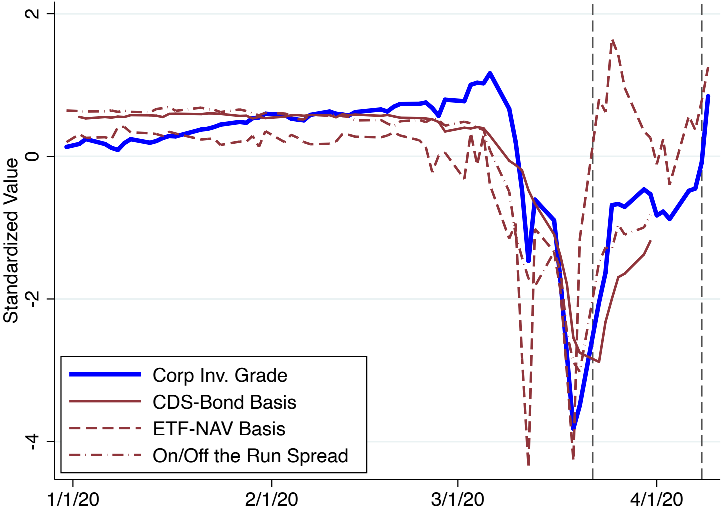
Cross-section of CDS-Bond Basis



ETF-NAV Basis

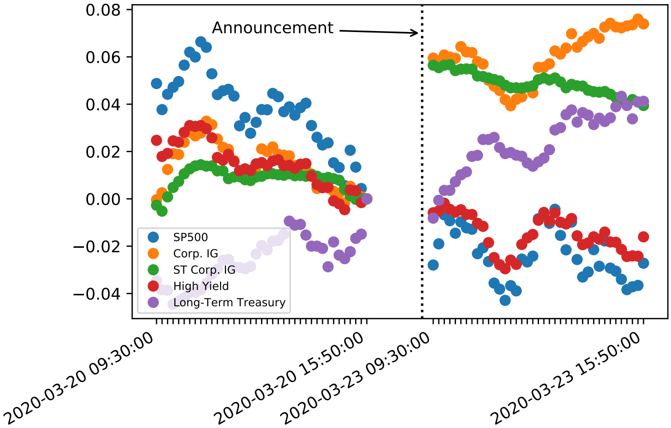


Synchronization of Price Changes and Dislocations



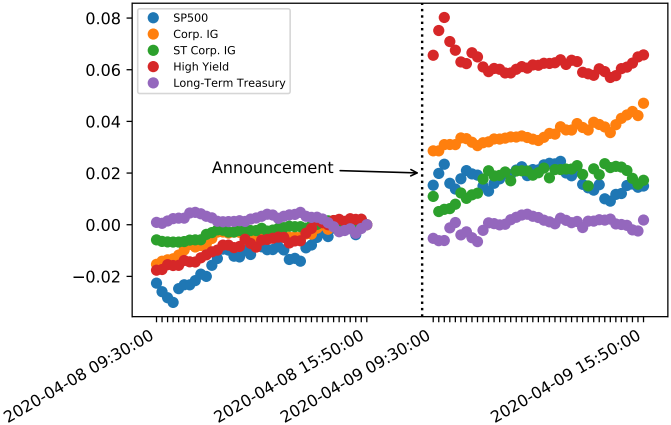
Effect of Fed Interventions

March 23: Announce Corporate Bond Purchases



- Strong response in investment grade: 6% (return) $\times$ \$6T (market size) $=$ \$360bn $\approx$ facility size (\$300bn)

April 9: Expand Scale and Scope of Purchases

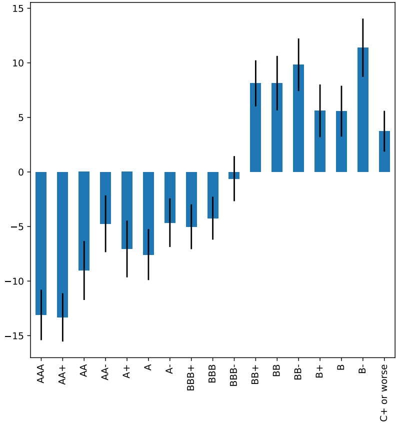


Other Fed Interventions

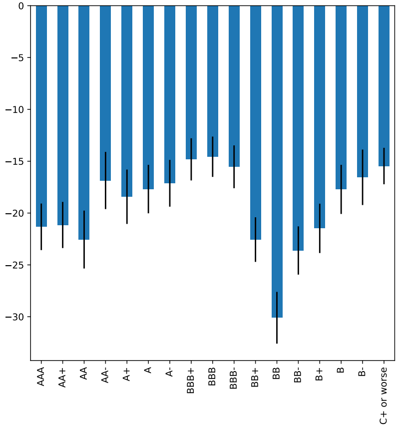
	Investment Grade				High Yield			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
March 18 (PDCF)	-3.13***	-0.17	-0.16	-0.04	-3.24***	-0.05	-0.05	-0.08
	(-5.31)	(-0.39)	(-0.37)	(-0.09)	(-3.75)	(-0.15)	(-0.14)	(-0.23)
March 23 (P/SMCCF)	4.03***	4.63***	4.63***	5.00***	0.48	0.48	0.49	0.69**
	(6.83)	(11.45)	(11.48)	(13.01)	(0.55)	(1.54)	(1.58)	(2.24)
April 2 (SLR)	0.18	0.04	0.05	-0.24	-0.23	0.08	0.09	-0.12
	(0.30)	(0.10)	(0.12)	(-0.63)	(-0.27)	(0.24)	(0.28)	(-0.40)
April 9 (P/SMCCF)	2.75***	2.42***	2.42***	2.59***	6.09***	5.41***	5.42***	5.57***
	(4.67)	(6.04)	(6.06)	(6.88)	(7.06)	(17.37)	(17.55)	(18.34)
May 12 (Buy)	1.26**	1.03**	0.97**	0.98**	0.70	0.52*	0.29	0.34
	(2.14)	(2.59)	(2.38)	(2.58)	(0.82)	(1.68)	(0.88)	(1.03)
June 16 (Buy)	0.47	-0.03	-0.02	0.25	1.26	-0.27	-0.26	-0.12
	(0.80)	(-0.07)	(-0.06)	(0.66)	(1.46)	(-0.85)	(-0.83)	(-0.38)
Mkt		0.44***	0.44***	0.33***		0.49***	0.49***	0.41***
		(15.98)	(16.01)	(10.13)		(22.90)	(23.04)	(14.11)
$Treas$		0.35***	0.35***	0.37***		-0.11***	-0.11***	-0.10***
		(8.95)	(8.96)	(10.12)		(-3.53)	(-3.62)	(-3.49)
CDX				-5.89***				-0.78***
				(-5.82)				(-3.71)
ETF Buys			0.44	0.42			2.10*	1.95*
			(0.85)	(0.87)			(1.86)	(1.77)
N	244	244	243	240	244	244	243	240
Adj. R^2	0.283	0.671	0.672	0.714	0.201	0.896	0.898	0.905

Individual Bonds Across Ratings

$\Delta log(spread)$: March 23



$\Delta log(spread)$:April 9



- In the paper: maturity, belonging to an ETF, ...

Did the Fed Close the Dislocations?

	Δspread on March 23			Δspread on April 9		
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	49.51***			-64.81***		
	(9.15)			(6.30)		
$\Delta \text{basis}_{2/28 \rightarrow \text{day before ann.}}$	-0.14***			0.13***		
	(0.04)			(0.04)		
IG		31.33**	13.75		-60.93***	-16.81*
		(12.57)	(14.50)		(7.12)	(9.65)
$\text{IG} \times \Delta \text{basis}_{2/28 \rightarrow \text{day before ann.}}$		-0.15***	-0.11**		0.23***	-0.07
		(0.05)	(0.05)		(0.05)	(0.07)
$\text{IG} \times \Delta \text{cds}_{2/28 \rightarrow \text{day before ann.}}$			0.07**			-0.26***
			(0.03)			(0.04)
HY		68.75***	49.08***		-68.71***	-33.51**
		(11.35)	(18.74)		(10.86)	(13.22)
$\text{HY} \times \Delta \text{basis}_{2/28 \rightarrow \text{day before ann.}}$		0.11*	0.09		-0.33***	-0.26***
		(0.06)	(0.06)		(0.09)	(0.09)
$\text{HY} \times \Delta \text{cds}_{2/28 \rightarrow \text{day before ann.}}$			0.06			-0.19***
			(0.04)			(0.05)
N	310	310	310	308	308	308
R^2	0.04	0.20	0.21	0.03	0.14	0.27

Interpreting the Data

Fundamentals

- *Cash flows*: intuitive given large drop in GDP
- *Risk compensations*: more uncertainty, low GDP triggers habit, long-run risk ...

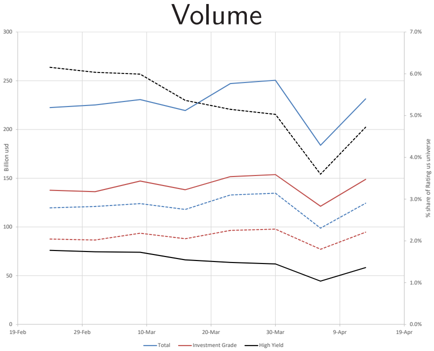
→ Difficult to explain similar losses on investment-grade and high-yield, and close to stocks

→ Difficult to reconcile with the fact that dislocations represent bulk of price drop

Trading Freeze

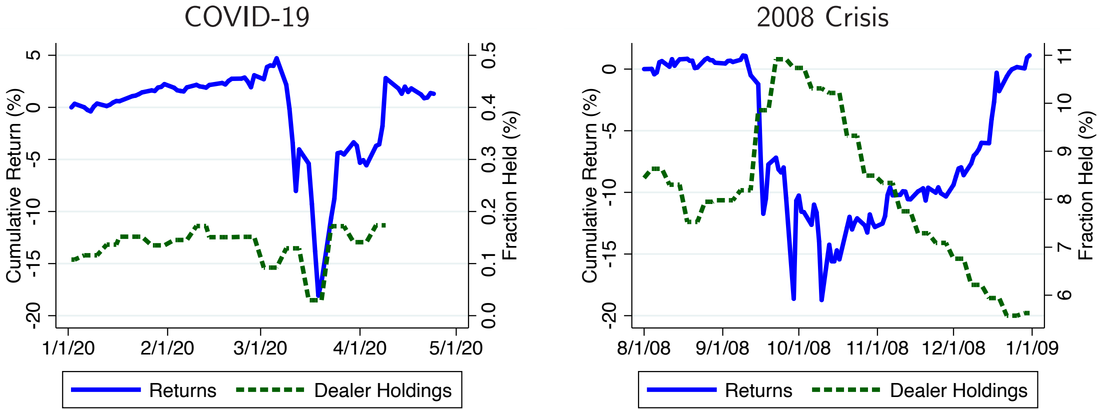
- Market breakdown?

→ No meaningful change in volume, increase if anything



- See also: Kargar et al. 2020, O'Hara and Zhou 2020

Plumbing: Dealers



- Disintermediation due to post-crisis regulation, increased cost of balance sheet space

Plumbing: Dealers

Three challenges:

→ Strong price and quantity response when the Fed *announces* future bond purchases (March 23, April 9)

→ No price response to PDCF (March 17) and relaxation of leverage regulation for Treasuries (April 1)

→ Intermediation costs tend to be larger or equal for high-yield than for investment-grade

Widespread Selling Pressure

- Widespread and persistent selling pressure, but not due to asset fundamentals

Widespread Selling Pressure

- Widespread and persistent selling pressure, but not due to asset fundamentals
- Price dislocations suggest need for liquidity or cash
  - Selling usually more liquid investment-grade bonds (Ma Xiao Zeng 2020)
  - Selling bonds rather than insuring them with CDS
  - Selling more liquid ETFs first

Widespread Selling Pressure

- Widespread and persistent selling pressure, but not due to asset fundamentals
- Price dislocations suggest need for liquidity or cash
  - Selling usually more liquid investment-grade bonds (Ma Xiao Zeng 2020)
  - Selling bonds rather than insuring them with CDS
  - Selling more liquid ETFs first
- Who is selling?
  - *Mutual funds*: $326bn outflow from bond funds (see Falato et al 2020)

Future selling

- Immediate selling might be tip of the iceberg: *anticipation of future* selling creates large price drops
  - *Mutual funds*: fragility of funding structure (Goldstein et al. 2017, Falato et al 2020)
  - *Life insurers*: typically slow-moving, but predictable future sales plausible (Chodorow-Reich, Ghent, Haddad 2020)
  - *Issuers*: borrow more due to revenue shock (Greenwald et al. 2020, Fahlenrach et al. 2020, Chodorow-Reich et al. 2020)
- Anticipation of future buying works: Fed effect even though buying has not started

Evidence of Liquidation Pressure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$ln(MFsales)$			12.95***		12.61***	14.72***	12.78***	13.12***
			(6.30)		(6.21)	(3.56)	(3.29)	(2.87)
$ln(issuance)$				11.01**	9.08**	13.64**	13.94***	12.55*
				(2.44)	(2.04)	(2.42)	(2.63)	(1.95)
$liquidity$		8.63***			7.87***	11.41***	11.87***	13.82***
		(4.95)			(4.76)	(4.55)	(4.91)	(4.76)
$leverage$						-1.53	-3.22	
						(-0.20)	(-0.40)	
$cash$						-0.76	-0.35	
						(-0.41)	(-0.19)	
$debt\ structure$						0.17	-29.48*	
						(0.01)	(-1.76)	
$\Delta ln(cds_{i,t})$								0.08*
								(1.73)
IG	23.55***	25.28***	29.21***	23.58***	30.66***	37.76***	42.89***	32.55***
	(10.58)	(11.08)	(12.19)	(10.58)	(12.40)	(7.63)	(8.17)	(6.51)
$short$	72.00***	71.05***	70.96***	71.98***	70.10***	66.10***	65.65***	73.03***
	(49.57)	(48.46)	(50.21)	(49.44)	(48.77)	(29.25)	(28.77)	(25.68)
constant	72.16***	67.25***	55.55***	70.84***	50.42***	40.11***	42.29***	35.27***
	(37.17)	(30.18)	(16.62)	(35.12)	(14.22)	(5.29)	(5.45)	(3.67)
Industry FE	N	N	N	N	N	N	Y	Y
Observations	5,320	5,320	5,320	5,320	5,320	2,355	2,341	1,761
R-squared:	0.39	0.40	0.41	0.40	0.41	0.39	0.45	0.50

Conclusion

- **COVID-19 crisis created large tremors on debt markets**
  - -20% return on investment-grade bonds
  - Large price dislocations: ETF-NAV, CDS-Bond
  - Reversion because of Fed intervention
- Overall strongly suggest widespread and persistent selling pressure
  - rather than frictionless fundamentals
  - rather than purely dealer-centric issues
  - consistent with many institutions needing liquidity

- Lots of great work on debt markets and COVID-19: Augustin et al., Boyarchenko et al., Brunnermeier and Krishnamurthy, D'Amico et al., Duffie, Fleming et al., He et al., Kargar et al., Ma et al., O'Hara and Zhou, Schrimpf et al., Vissing-Jorgensen, ...