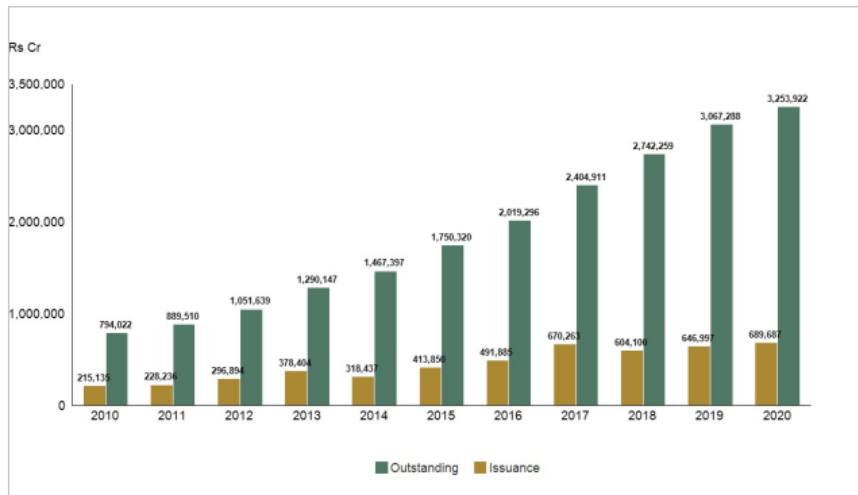# Pricing anomalies in the Indian corporate bond market

Rajeswari Sengupta (IGIDR) and Harsh Vardhan (SPJIMR)

December 15, 2021
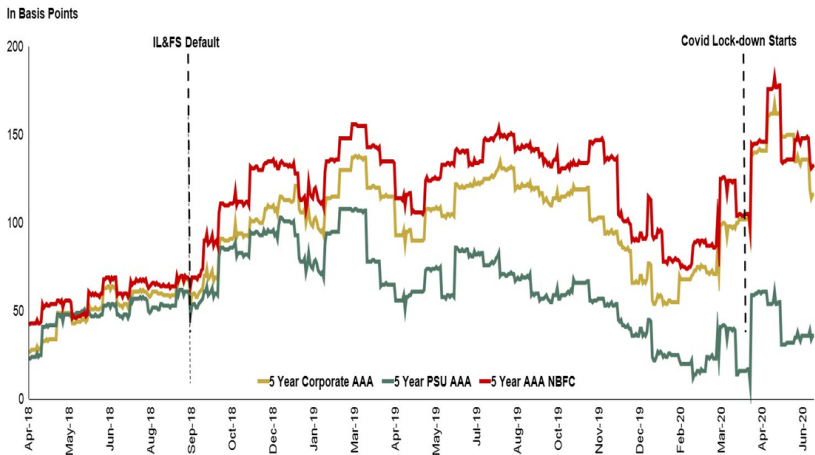
Corporate bond issuance and outstanding

Based on Crisil report

Credit spreads on 5 Year AAA bonds

Aggregate data from Bloomberg

Rajeswari Sengupta (IGIDR) and Harsh Vardhan (SPJIMR)   Pricing anomalies in the Indian corporate bond market
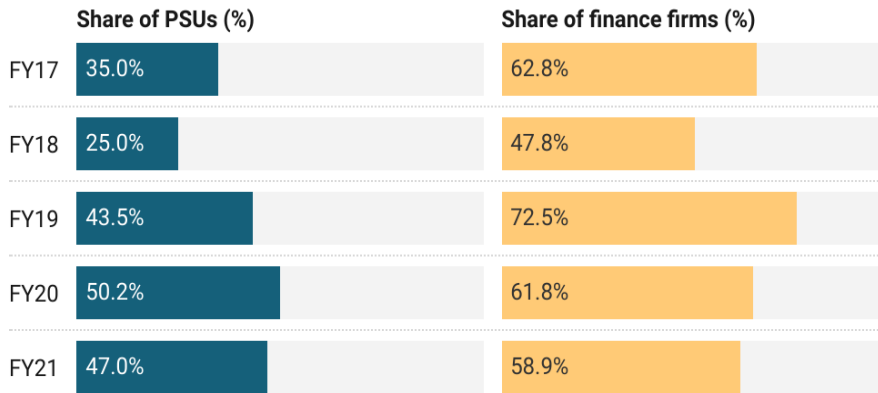
Pricing anomalies in corporate bonds?

- ▶ Corporate bonds present 2 risks to investors: credit risk and market risk.

- ▶ Price of a bond depends on 2 factors: credit rating and maturity.

- ▶ Bonds with identical maturities and credit ratings, issued in close proximity should be priced identically.

- ▶ Any difference in their pricing is an anomaly.

1. Is there evidence of pricing anomalies in the corporate bond market?

2. Can this be established in a robust manner?

Data

▶ Collect data on every bond issued from FY2011 to FY2021 from NSDL.

▶ Data on issuer, issue size, coupon rate, credit rating, maturity for 13,360 issuances.

▶ Use data on 7,455 issuances from FY2017 to FY2021.

▶ Consider highest rating for each bond and assign default probabilities using data from CRISIL, ICRA, and CARE.

Shares in volume of issuances, FY2017-FY2021

Share of PSUs (%)

	Share of PSUs (%)
FY17	35.0%
FY18	25.0%
FY19	43.5%
FY20	50.2%
FY21	47.0%

Share of finance firms (%)

	Share of finance firms (%)
FY17	62.8%
FY18	47.8%
FY19	72.5%
FY20	61.8%
FY21	58.9%

Source: NSDL, Authors' calculation • Created with Datawrapper

Rajeswari Sengupta (IGIDR) and Harsh Vardhan (SPJIMR)   Pricing anomalies in the Indian corporate bond market

Volumes by rating categories, FY2017-FY2021

Issue size (Rs. bn)

	AAA	AA	A	BBB	BB	B	C	D	NA (proxied: B)
2017	2497	939	137	30	5	67	4	722	615
2018	2070	768	69	88	5	9	133	470	1180
2019	4064	702	108	64	14	20	4	243	288
2020	4528	632	114	40	3	4		8	357
2021	5527	1204	245	65	9	3		3	619
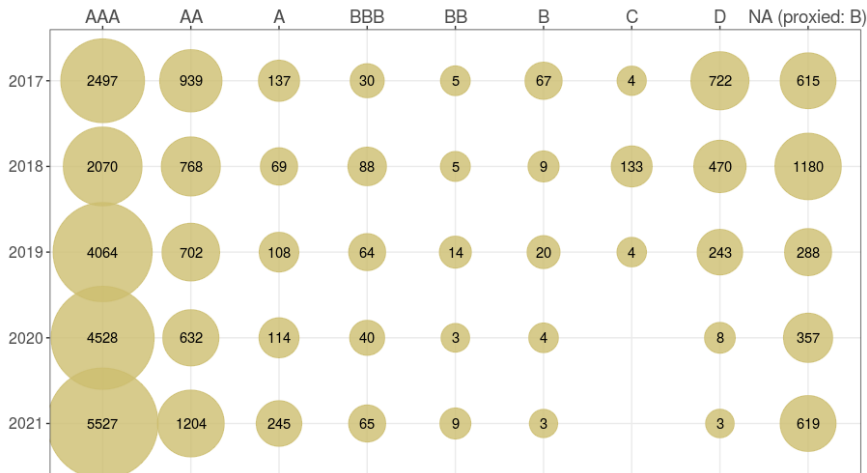
Pricing anomaly, April 2018 to March 2021

Price difference between best priced and worst priced AAA bonds issued within a month, across maturities

Rajeswari Sengupta (IGIDR) and Harsh Vardhan (SPJIMR)   Pricing anomalies in the Indian corporate bond market
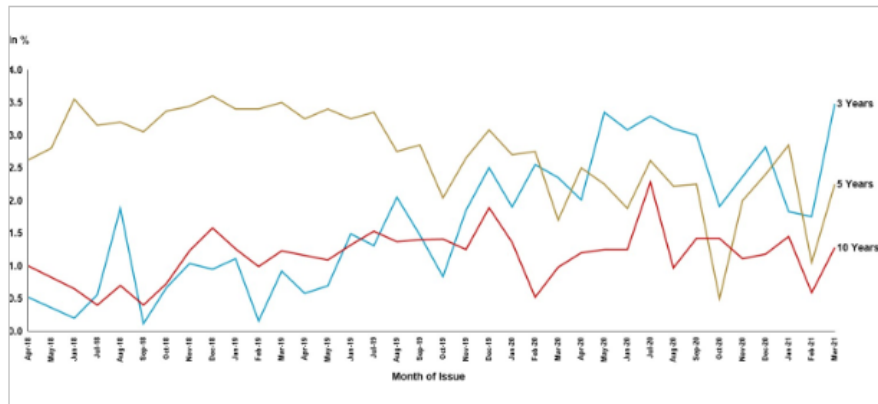
I. Is there evidence of pricing anomalies in bond market?

Maturity of bonds	Pricing difference between best priced and worst priced bonds
10 years	116 basis points
5 years	271 basis points
3 years	167 basis points

▶ Best priced bonds are issued by the PSU entities.

▶ NBFC bonds are best priced when government owned and worst priced when privately owned.

II. Can we establish pricing anomalies in a robust manner?

▶ We calculate credit spreads for all issuances.

▶ Account for market risk by deducting GSec yield of corresponding maturity.

▶ Credit spreads should be determined solely by default probability.

▶ Higher the default probabilities (or lower the credit ratings), the higher would be the credit spreads.

▶ The influence of other factors on credit spreads would point towards pricing anomalies.

Determinants of credit spreads, FY2017-FY2021

	Dep var: Credit spread
	Full sample
Default probability	0.014***
	(0.004)

Determinants of credit spreads, FY2017-FY2021

	Dep var: Credit spread
	Full sample
Default probability	0.014^{***}
	(0.004)
Issue size	-0.003^{***}
	(0.001)
Maturity period	0.0001^{***}

Determinants of credit spreads, FY2017-FY2021

	Dep var: Credit spread
	Full sample
Default probability	0.014^{***}
	(0.004)
Issue size	-0.003^{***}
	(0.001)
Maturity period	0.0001^{***}
	(0.00002)
PSU	-2.086^{***}
	(0.159)
Finance	-1.252^{***}
	(0.097)
N	7455
Adjusted R-sq	0.12

Determinants of credit spreads, FY2017-FY2021

	Dep. var: Credit spread		
	Full sample (1)	PSU (2)	Non-PSU (3)
Default probability	0.014*** (0.004)	−0.002 (0.037)	0.013*** (0.004)
Issue size	−0.003*** (0.001)	−0.0002 (0.0003)	−0.004** (0.002)
Maturity period	0.0001*** (0.00002)	0.0002*** (0.00002)	−0.00000 (0.00002)
PSU	−2.086*** (0.159)		
Finance	−1.252*** (0.097)	−0.236* (0.124)	−1.316*** (0.109)
N	7455	662	6797
Adjusted R-sq	0.12	0.12	0.05
Note:	*p<0.1; **p<0.05; ***p<0.01		

Determinants of credit spreads, FY2017-FY2021

	Dep. var:Credit Spread				
	Full sample (1)	PSU (2)	Non-PSU (3)	Finance (4)	Non-finance (5)
Default probability	0.014^{***}	-0.002	0.013^{***}	-0.008^{**}	0.037^{***}
	(0.004)	(0.037)	(0.004)	(0.004)	(0.009)
Issue size	-0.003^{***}	-0.0002	-0.004^{**}	-0.004^{***}	-0.003^{***}
	(0.001)	(0.0003)	(0.002)	(0.0004)	(0.001)
Maturity period	0.0001^{***}	0.0002^{***}	-0.00000	0.0001^{***}	0.00004
	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00003)
PSU	-2.086^{***}			-1.841^{***}	-2.559^{***}
	(0.159)			(0.110)	(0.257)
Finance	-1.252^{***}	-0.236^{*}	-1.316^{***}		
	(0.097)	(0.124)	(0.109)		
N	7455	662	6797	3325	4134
Adjusted R-sq	0.12	0.12	0.05	0.14	0.05
Note:				*p$<$0.1; **p$<$0.05; ***p$<$0.01	

Implications

▶ Raises questions about the credibility of credit ratings.

▶ PSU issuers enjoy a 'subsidy' in bond pricing.

▶ Anomalies in pricing of bonds distorts price discovery.

Ongoing work

▶ Do pricing anomalies go up during conditions of tight liquidity?

▶ Do pricing anomalies go up after 'negative' events in securities markets?

Thank You
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