



China's No-bailout Reform: Impact on Bond Yields and Rating Standards

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Background

- Chinese domestic bond market is second largest in the world.
- Yet there had been no domestic bond default prior to 2014.
- Chinese governments, at all levels, bailed out, directly or indirectly, any potential bond default (Lin and Milhaupt, 2017) before 2014
 - Too-big-to fail
 - Too-connected-to fail
 - Too-many-to fail

Background

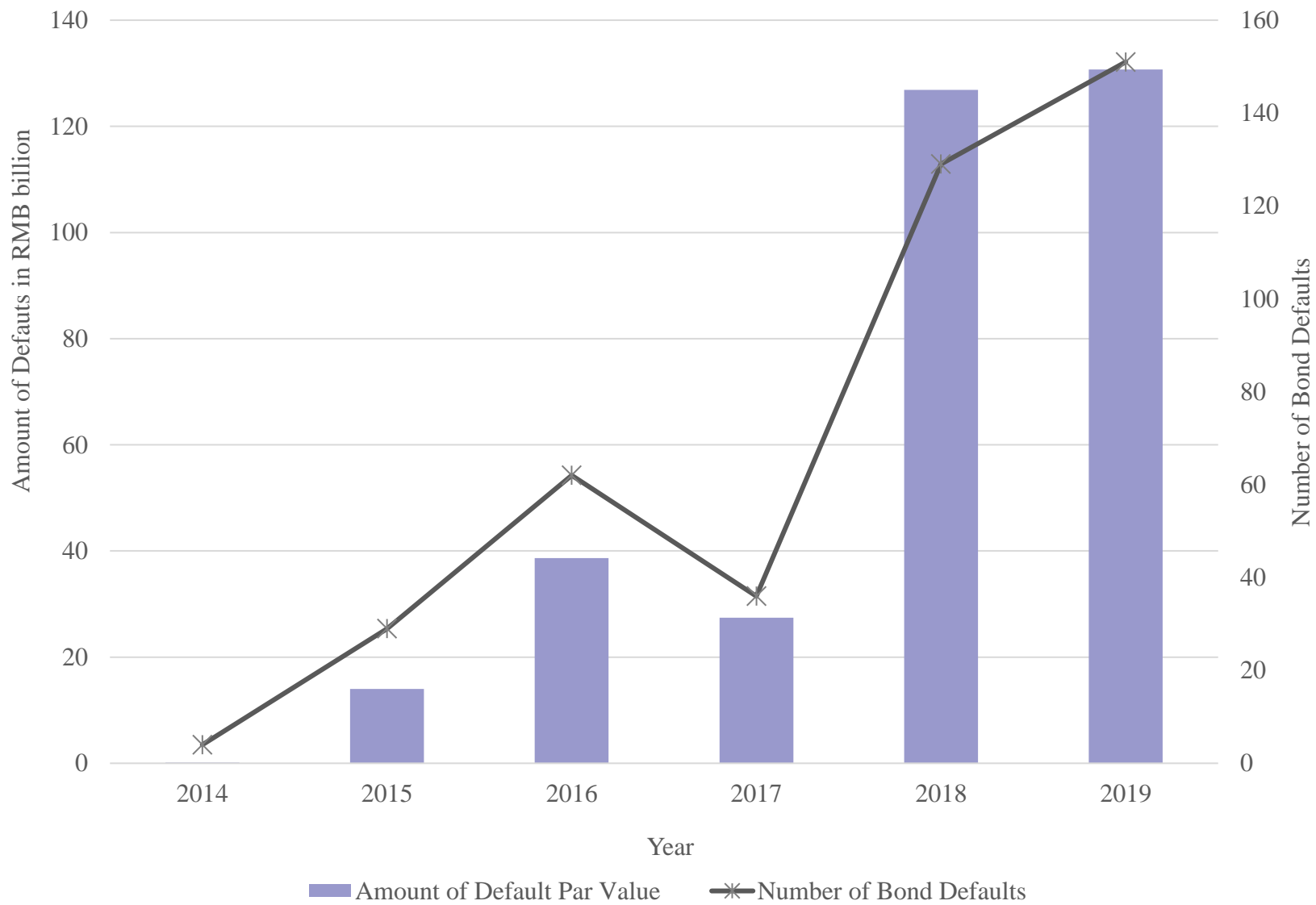
- While the bailout policy helped to foster the growth of the domestic bond market, it led investors to disregard credit risk.

“There have been no defaults, so everyone thinks that bonds cannot default. Investors are far too relaxed about credit risk.”

– Financial Times, 2012

First Chinese Bond Defaults

- In March 2014, Shanghai Chaori failed to make interest payment on its bond, making it the first domestic bond to default in China.
- In April 2015, Baoding Tianwei became the first SOE to default.
- Defaults by Chaori and Baoding Tianwei signaled Chinese government's change of its bailout policy.



Distributions of Defaults

	Number of Defaults	Total Par Value of Defaults (RMB Billion)	Mean Par Value of Default (RMB Billion)
Central Gov't SOE	20 (4.87%)	20.15 (5.96%)	1.01
Local Gov't SOE	41 (9.98%)	36.46 (10.79%)	0.89
Non-SOE	345 (83.94%)	280.69 (83.08%)	0.81
Unknown	5 (1.22%)	0.56 (0.17%)	0.11

Hypotheses

- *Hypothesis 1a. Chinese CRAs tightened their bond rating standards following the first bond default in 2014.*
- *Hypothesis 1b. Chinese CRAs loosened their bond rating standards following the first bond default in 2014 and assigned AAA ratings to a higher proportion of bonds.*

Hypotheses

- *Hypothesis 2a. The yield spread of high-risk bonds over low-risk bonds widened following the first bond default in 2014.*
- *Hypothesis 2b. The yield spread of high-risk bonds over low-risk bonds did not change following the first bond default in 2014.*

Test of Hypothesis 1a and 1b

- To test hypotheses 1a and 1b, we use an ordered probit model of bond ratings:

$$Rating_i = \alpha + \sum \lambda_k * Issuer\ Characters_{k,i} + \beta_1 * POST_i + control + \varepsilon_i$$

- $Rating = 1$ for AAA, 2 for AA+, 3 for AA, and 4 for AA-
- $POST=1$ if bond issued after March 2014, 0 otherwise

Test of Hypothesis 1a and 1b

- Issuer character variables include three-year average firm size, interest coverage ratio, debt ratios, etc.
- 1,041 bonds issued between 2009 and 2019 by listed firms with 3 years of accounting data and 2 years of stock return data prior to bond issuance.

	<i>Prior-default</i>	<i>Post-Default</i>
Bond Ratings	2.530	1.974***
Log of Coverage Ratio	2.063	1.896***
Log of Market Cap	2.350	3.047***
Market to Book Ratio	2.247	1.831***
Total Debt Ratio	0.542	0.621***
Long Term Debt Ratio	0.135	0.178***
Operating Profit Margin	0.176	0.168
Return on Equity	0.111	0.092***
Equity Beta	1.108	1.183***
Market Model Error	0.024	0.021***
No. of Obs.	234	807

Bond Rating = 1 for AAA, =2 for AA+, etc.

	<i>Estimate</i>	<i>P-value</i>
Log of Coverage Ratio	0.039	0.637
Total Debt Ratio	1.890	<0.001
Long Term Debt Ratio	-0.576	0.316
Operating Profit Margin	0.542	0.258
Return on Equity	-4.092	0.002
Log of Market Cap	-1.915	<0.001
Market to Book Ratio	0.757	<0.001
Equity Beta	0.383	0.078
Market Model Error	32.442	<0.001
LocalSOE	0.177	0.211
NonSOE	1.152	<0.001
GP_CRA	0.313	<0.001
Intercepts		Yes
Industry Dummies		Yes
Pseudo R-squared		0.78
No. of Obs.		1,041

	Model 2		Model 3	
	Estimate	P-value	Estimate	P-value
POST	-0.209	0.078		
2010			-0.111	0.818
2011			-0.499	0.237
2012			-0.607	0.140
2013			-0.408	0.348
2014			-0.301	0.486
2015			-0.095	0.821
2016			-0.434	0.299
2017			-0.915	0.026
2018			-1.053	0.009
2019			-1.196	0.005
Twelve Control Variables	Yes		Yes	
Intercepts	Yes		Yes	
Industry Dummies	Yes		Yes	
Pseudo R-squared	0.78		0.80	
No. of Obs.	1,041		1,041	

Test of Hypotheses 2a and 2b

- Test the changes in the yield spreads between lower rated and highly rated bonds.
 - Examine the changes in yields of outstanding bonds around the event date (March 4, 2014).
 - Less likely to be contaminated by confounding factors and/or rating changes.
 - Examine the differences in offering yields on newly issued bonds prior to and after the first default events.
 - Test if the impact is long-lasting or a temporary shock.

Yield Changes around Event Date

- 1,366 outstanding corporate bonds
- Daily average treasury yield spreads 60 days prior to and 60 days after March 4, 2014
- No rating change during the 120 event windows

	Prior-default	Post-default	Change	No. of Obs.
<i>Panel A. Whole Sample</i>				
AAA	1.64%	1.74%	0.10% ***	432
AA+	2.46%	2.53%	0.07% ***	340
AA	3.20%	3.33%	0.13% ***	512
AA-	4.10%	4.52%	0.42% ***	82
All Rating Categories	2.57%	2.70%	0.13% ***	1,366

Yield Changes around Event Date

Panel B. Non-SOE Bonds

AAA	1.86%	1.95%	0.09%	9
AA+	2.66%	2.80%	0.14% **	84
AA	3.58%	3.82%	0.24% ***	243
AA-	4.43%	4.83%	0.40% ***	46
All Rating Categories	3.44%	3.67%	0.23% ***	382

Panel C. SOE Bonds

AAA	1.63%	1.74%	0.11% ***	423
AA+	2.39%	2.44%	0.05% *	256
AA	2.86%	2.90%	0.04%	269
AA-	3.68%	4.13%	0.45% ***	36
All Rating Categories	2.24%	2.32%	0.08%	984

Panel D. Non-SOE Bonds minus SOE Bonds

AAA	0.23%	0.21%	-0.02%
AA+	0.27%	0.36%	0.09% *
AA	0.72%	0.92%	0.20% ***
AA-	0.75%	0.70%	-0.05%
All Rating Categories	1.20%	1.35%	0.15% ***

New Bond Issue Data

- 4,712 newly issued non-financial public Chinese bonds with fixed coupon rates between 2009 and 2019.
- The sample excludes the followings:
 - Bonds with third-party guarantees
 - Non-rated bonds
 - Semi-municipal bonds, or Chengtou bonds
 - Issues with maturity < 1 year
 - Convertible bonds

Mean Treasury Spreads

	Whole Sample	Prior-default	Post-default	Changes
Panel A. By Ratings				
AAA	1.32%	1.56%	1.25%	-0.31%***
AA+	2.19%	2.15%	2.21%	0.06%
AA	2.87%	2.79%	2.92%	0.13%***
AA-	3.87%	3.71%	4.25%	0.54%***
Panel B. By Ownership				
Central SOE	1.34%	1.70%	1.20%	-0.50%***
Local SOE	1.98%	2.33%	1.83%	-0.50%***
Non-SOE	2.84%	3.01%	2.79%	-0.22%***

Treasury Spread Regression

<i>Parameter</i>	<i>Model 1</i>		<i>Model 2</i>		<i>2013-2015</i>	
	<i>Estimate</i>	<i>P-Value</i>	<i>Estimate</i>	<i>P-Value</i>	<i>Estimate</i>	<i>P-Value</i>
Intercept	1.431	<.0001	1.559	<.0001	2.173	<.0001
POST			-0.817	<.0001	-0.806	<.0001
AA+	0.656	<.0001	0.420	<.0001	0.161	0.0742
AA+*POST			0.286	<.0001	0.241	0.0186
AA	1.228	<.0001	0.981	<.0001	0.787	<.0001
AA*POST			0.371	<.0001	0.435	<.0001
AA-	2.162	<.0001	1.894	<.0001	1.578	<.0001
AA-*POST			0.757	<.0001	0.913	<.0001
Local SOE	0.133	<.0001	0.048	0.2520	0.131	0.0939
Local SOE*POST			0.111	0.0198	0.039	0.6639
Non-SOE	0.732	<.0001	0.347	<.0001	0.424	<.0001
Non-SOE*POST			0.504	<.0001	0.346	0.0017
Control Variables	Yes		Yes		Yes	
Industry Dummies	Yes		Yes		Yes	
Year Dummies	Yes		Yes		Yes	
R-squared	0.66		0.68		0.70	
OBS	4,712		4,712		1,291	

Mean Treasury Spreads by Issuer/Bond Types

	AAA	AA+	AA	AA-
<i>Panel A. Non-SOE Bonds</i>				
Prior-default	2.40% (5)	2.28% (35)	2.89% (186)	3.95% (54)
Post-default	1.58% (159)	2.78% (274)	3.26% (323)	4.50% (23)
Change	-0.82% **	+0.50% ***	+0.37% ***	+0.55% ***
<i>Panel B. SOE Bonds</i>				
Prior-default	1.55% (501)	2.14% (257)	2.72% (261)	3.45% (49)
Post-default	1.22% (1,723)	1.89% (494)	2.61% (348)	3.96% (20)
Change	-0.33% ***	-0.25% ***	-0.11% *	+0.51% **
<i>Panel C. Financial Bonds</i>				
Prior-default	1.38% (57)	1.60% (21)	1.91% (13)	2.20% (22)
Post-default	1.14% (620)	1.52% (330)	1.82% (216)	1.87% (139)
Change	-0.24% ***	-0.08%	-0.09%	-0.33% ***

Difference-in-Difference-in-Difference Analysis

<i>SOE vs. Non-SOE Bonds</i>			<i>Financial vs. Non-Financial Bonds</i>		
<i>Parameter</i>	<i>Estimate</i>	<i>P-Value</i>	<i>Parameter</i>	<i>Estimate</i>	<i>P-Value</i>
Intercept	1.633	<.0001	Intercept	1.994	<.0001
AA+	0.446	<.0001	AA+	0.111	.4656
AA	0.993	<.0001	AA	0.354	.0534
AA-	1.737	<.0001	AA-	0.696	<.0001
NonSOE	1.006	.0001	NonFIN	0.048	.6347
AA+*NonSOE	-0.922	.0010	AA+*NonFIN	0.359	.0233
AA*NonSOE	-0.728	.0061	AA*NonFIN	0.765	<.0001
AA-*NonSOE	-0.400	.1580	AA-*NonFIN	1.333	<.0001
POST	-0.751	<.0001	POST	-0.673	<.0001
POST*NonSOE	-0.582	.0275	POST*NonFIN	-0.007	.9402
AA+*POST	0.203	.0002	AA+*POST	0.086	.5832
AA*POST	0.303	<.0001	AA*POST	0.133	.4794
AA-*POST	1.028	<.0001	AA-*POST	-0.081	.6093
AA+*POST*NonSOE	1.406	<.0001	AA+*POST*NonFIN	0.354	.0319
AA*POST*NonSOE	1.163	<.0001	AA*POST*NonFIN	0.392	.0435
AA-*POST*NonSOE	0.521	.1220	AA-*POST*NonFIN	1.000	<.0001
Control Variables	Yes				
Industry Dummies	Yes				
Year Dummies	Yes				
Adj. R-squared	0.69				
OBS	4,711				
			6,129		

Conclusion

■ Good news

- Credible threats of defaults enhance credit risk-based bond pricing and capital allocation.

■ Bad news

- Continued government support for SOEs exasperates the funding disadvantage of non-SOEs in the public bond market.
- CRAs loosen rating standards and perpetuate rating inflation.



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