Internet Appendix
Who Prices Credit Rating Inflation?

This internet appendix is divided into two sections. The first section describes the secondary market data and its matching with DealScan. The second section provides supplementary figures and tables.

A. Secondary market data

LPC collects self-reported data starting from 1998 from brokers that quote prices on secondary market loans. There are 27,129 unique loans in the database which are identified by a proprietary loan identification number (*lin*). Refinitiv provides a proprietary "translation matrix" linking *lin* to the FacilityID identifiers from DealScan. This link is available for 22,671 loans.

Not all loans with quotes in LPC are featured in DealScan. In fact, a direct merge between the two complete databases using the translation matrix matches 4.9% of the 379 thousand unique FacilityIDs in DealScan. This low matching rate is partly explained by the fact that loans traded less frequently in the past–the fraction of traded loans increased from 10% in the early 2000s to 40% in 2013 (Beyhaghi and Ehsani (2017)). It is likely that LPC has low coverage for loans that are sold infrequently, and loans that are sold directly without the involvement of a broker.

We are able to match 75 of the 1,814 facilities in our loan sample, which translates into a 4.1% matching rate. One reason why our matching rate is slightly lower than the overall matching rate of 4.9% is that 80% of our sample are revolving loan facilities, whereas revolving loans represent only about 40% of loans in DealScan. Revolving loans are traded less frequently, with only about 14% of loans with secondary market data being revolving loans.

Since our matched sample is small, we formally test whether these loans are different from the universe of traded loans or from the PSD loans in our sample that are not in the secondary market data. In Table IA.15, we compare the 75 matched loans to the remaining loans traded in the secondary market. We find that while matched loans tend to be offered at lower discounts upon their first quote and exhibit lower standard deviations of their price over time, these differences are not statistically significant. The only statistically significant difference is that matched loans have an average of 1.5 brokers quoting a price on them, compared to an average of 2.2 brokers for non-matched loans. Overall, the matched loans seem to be representative of the universe of traded loans.

In Table IA.16, we compare the firms that issued our 75 matched loans to the firms that issued the remaining PSD loans in our sample. These two types of borrowers are similar across most dimensions. However, the matched firms tend to have credit ratings about 1.5 notches below and larger loans than their counterparts. To avoid any observable difference from impacting our comparison between traded and non-traded loans, we use a nearest neighbor matching framework in our analysis of whether loans are more likely to be traded if they feature higher costs of downgrades. We test for differences between the two types of loans in Table IA.14. We find that there are no economically or statistically significant differences between the firms in the two samples.

B. Supplementary figures and tables

Figure IA.1
Distribution of credit ratings at origination
The figure shows the distribution of credit ratings at the time of loan origination for our sample of credit rating–based PSD loans. The credit rating scale is simplified by combining the credit ratings within each letter credit rating category. For example, we combine the initial credit ratings of A+, A, and A- into one group, A.

Figure IA.2
Pricing grid steepness
This figure shows the distribution of the average cost of a downgrade for our sample of credit rating–based PSD loans by credit rating at origination. The credit rating scale is simplified by combining the credit ratings within each letter credit rating category. For example, we combine the initial credit ratings of A+, A, and A- into one group, A.
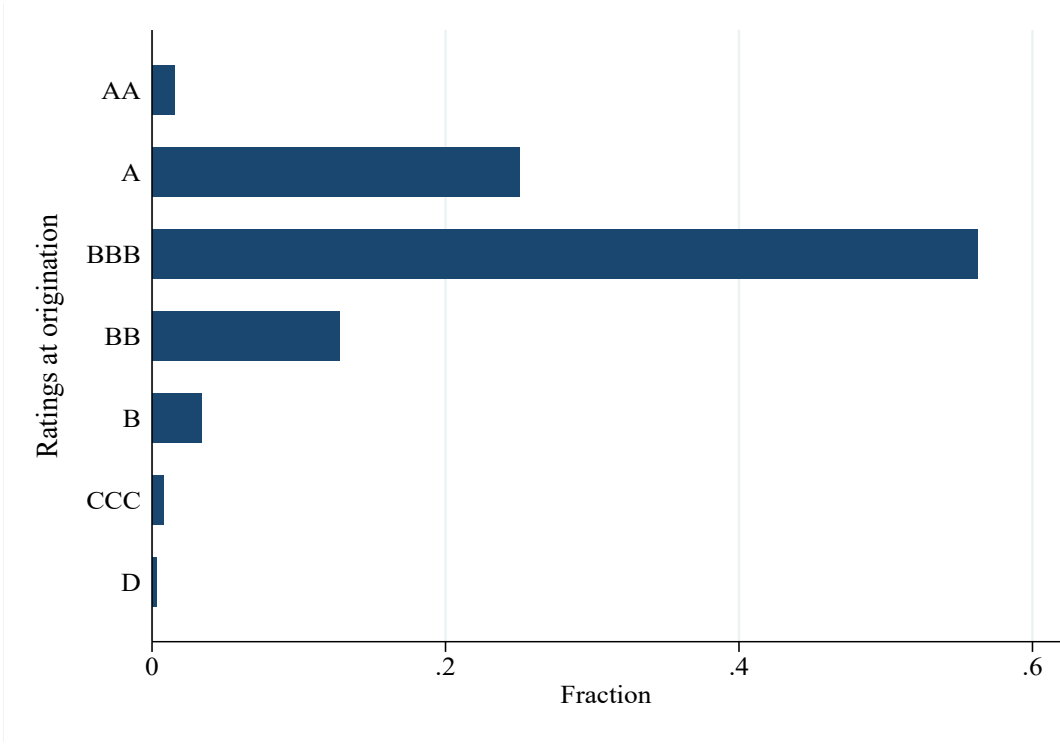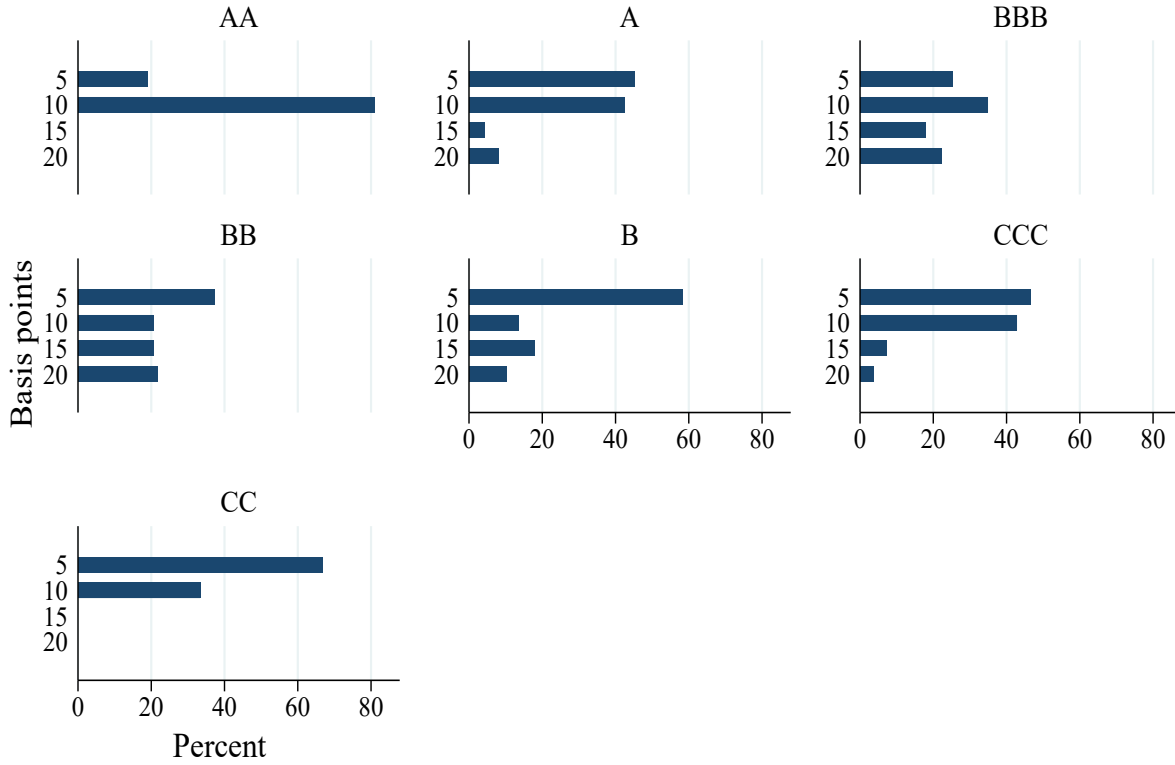
Figure IA.3
Annual volume of newly issued credit rating rating-based PSD
This figure shows the volume of newly issued credit rating–based performance-sensitive debt, by year.
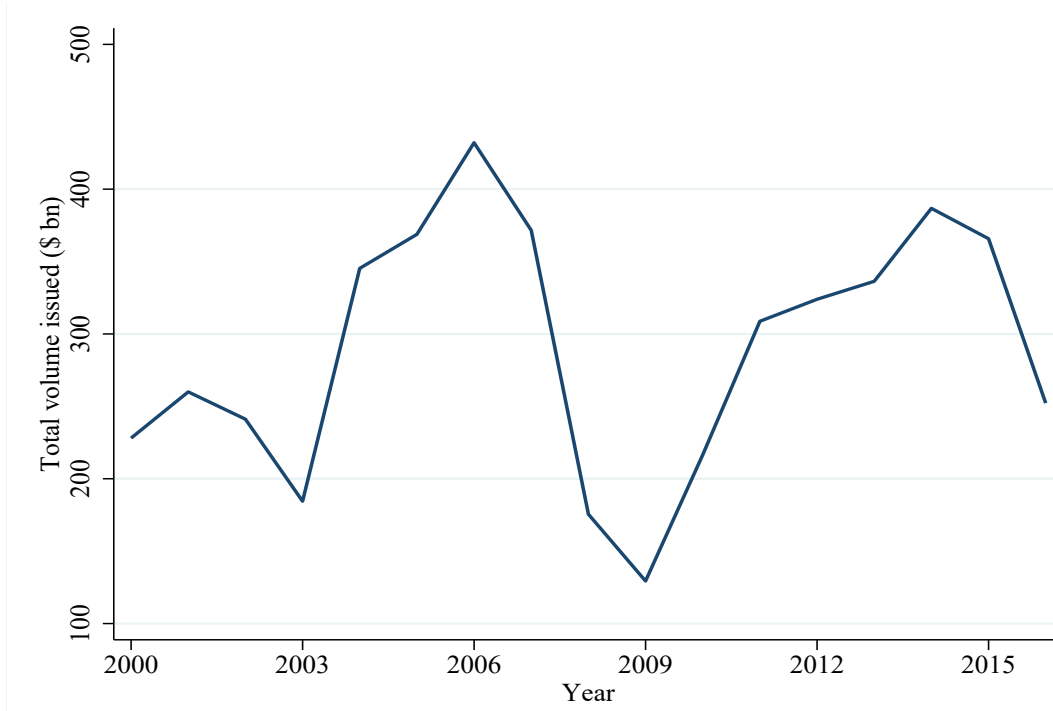
Figure IA.4

Coefficient estimate on cost of downgrade by year

This figure shows the effect of a one standard deviation increase in *cost of downgrade* on the probability that the borrower is downgraded, by year. We regress an indicator that takes the value of 1 if the borrower is downgraded on the interaction between *cost of downgrade* (a measure of the increase in the loan spread that would result from a credit rating downgrade of one notch) and indicator variables for each year. *cost of downgrade* is standardized so that regression coefficients reflect the impact of changing the variable by one standard deviation. Loan- and firm-level controls, as well as current credit rating, year, and firm fixed effects are included in the regression. The coefficients (in percentage points) associated with the interactions are denoted by solid circles, and the vertical bars denote the corresponding 95% confidence interval (based on standard errors clustered by firm).
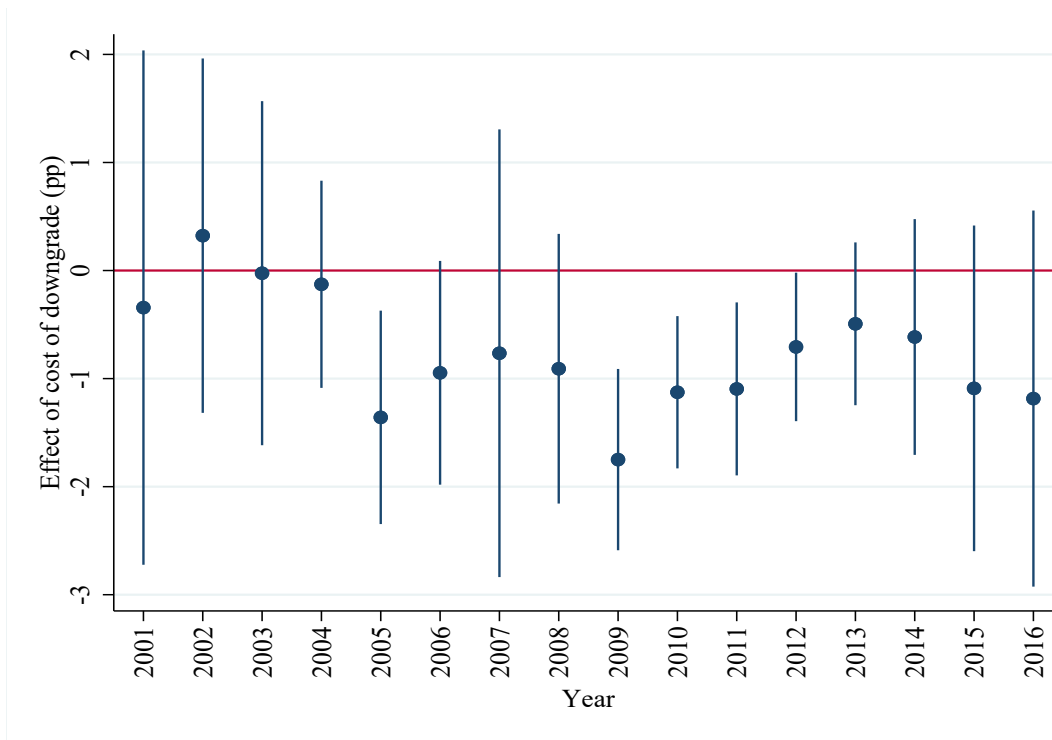
Table IA.1

Accounting ratio–based PSD loans versus credit rating–based PSD loans

This table compares a sample of accounting ratio–based PSD loans with our sample of credit rating–based PSD loans across observable characteristics. Observations are at the loan–year level. 1(·) denotes indicator variables. Statistical significance computations are based on heteroscedasticity-robust standard errors clustered by firm. ***p <0.01, **p <0.05, *p <0.10.

	Mean		
	Accounting ratio–based	Credit rating–based	Difference
Leverage	0.40	0.32	0.08***
Total assets ($ billions)	3.46	22.94	-19.47***
Intangibles over assets	0.30	0.21	0.09***
Profitability (ROA)	0.02	0.03	-0.01**
R&D ($ millions)	64.51	279.47	-214.96***
Number of financial covenants	2.76	1.52	1.24***
Loan amount ($ millions)	321.25	868.72	-547.48***
1(secured)	0.88	0.17	0.71***
Cost of one grid (rating or ratio, bp)	16.79	13.26	3.52***
N	17,756	20,725	38,481

Table IA.2

Robustness for Table 2: Year–quarter fixed effects

Regressions reported in this table are identical to Table 2, except that the regressions include year–quarter fixed effects instead of year fixed effects. Reported standard errors in parentheses are heteroscedasticity-robust and clustered by firm. ***$p <0.01$, **$p <0.05$, *$p <0.10$.

	1(downgrade)			
	(1)	(2)	(3)	(4)
Cost of downgrade	-0.784***	-0.841***	-0.739***	-0.807***
	(0.243)	(0.220)	(0.206)	(0.216)
Firm FE	Yes	Yes	Yes	Yes
Year-quarter FE	Yes	Yes	Yes	Yes
Rating FE	No	Yes	Yes	Yes
Loan controls	No	Yes	No	Yes
Firm controls	No	No	Yes	Yes
N	20,725	20,725	20,725	20,725
$Adj.R^2$	0.11	0.14	0.14	0.15
Mean of dependent variable	2.93	2.93	2.93	2.93

Table IA.3

Robustness for Table 2: Cost of downgrade based on two-notch downgrades

Regressions reported in this table are identical to Table 2, except that the variable for the cost of downgrade is based on two-notch downgrades instead of one-notch downgrades. Reported standard errors in parentheses are heteroscedasticity-robust and clustered by firm. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$.

	1(downgrade)			
	(1)	(2)	(3)	(4)
Cost downgrade 2 notches	-1.456***	-1.292***	-1.067***	-1.151***
	(0.358)	(0.290)	(0.260)	(0.278)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Rating FE	No	Yes	Yes	Yes
Loan controls	No	Yes	No	Yes
Firm controls	No	No	Yes	Yes
N	20,106	20,106	20,106	20,106
$Adj.R^2$	0.11	0.13	0.13	0.14
Mean of dependent variable	2.98	2.98	2.98	2.98

Table IA.4

Robustness for Table 2: Cost of downgrade as fraction of total assets

Regressions reported in this table are identical to Table 2, except that the variable for the cost of down-grade is constructed as a dollar cost divided by total assets. Reported standard errors in parentheses are heteroscedasticity-robust and clustered by firm. ***$p<0.01$, **$p<0.05$, *$p<0.10$.

	1(downgrade)			
	(1)	(2)	(3)	(4)
Cost of downgrade (% of assets)	-0.814***	-1.048***	-0.560***	-0.742***
	(0.197)	(0.210)	(0.192)	(0.209)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Rating FE	No	Yes	Yes	Yes
Loan controls	No	Yes	No	Yes
Firm controls	No	No	Yes	Yes
N	20,725	20,725	20,725	20,725
$Adj.R^2$	0.10	0.13	0.13	0.13
Mean of dependent variable	2.93	2.93	2.93	2.93

Table IA.5

Robustness for Table 2: Separate estimation for S&P and Moody's

Regressions reported in this table are identical to Table 2, except that the regressions are estimated separately for borrowers rated by S&P (Columns (1) and (2)) and Moody's (Columns (3) and (4)). Reported standard errors in parentheses are heteroscedasticity-robust and clustered by firm. ***$p <0.01$, **$p <0.05$, *$p <0.10$.

	1(downgrade)			
	S&P		Moody's	
	(1)	(2)	(3)	(4)
Cost of downgrade	-1.107***	-1.201***	-0.639*	-0.759*
	(0.226)	(0.238)	(0.339)	(0.390)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes	Yes
Loan controls	No	Yes	No	Yes
Firm controls	Yes	Yes	Yes	Yes
N	15,402	15,402	5,316	5,316
$Adj.R^2$	0.11	0.11	0.21	0.21
Mean of dependent variable	2.05	2.05	4.72	4.72

Table IA.6

Placebo test for Table 2: Sample of accounting ratio-based PSD loans

Regressions reported in this table are identical to Table 2, except the regressions are estimated using a sample of accounting ratio–based PSD loans (instead of credit rating–based PSD loans) and the independent variable of interest is *cost of moving to lower ratio bracket*, which represents the interest rate increase that would result from declining by one bracket in the pricing grid. Reported standard errors in parentheses are heteroscedasticity-robust and clustered by firm. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$.

	1(downgrade)			
	(1)	(2)	(3)	(4)
Cost of moving to lower ratio-bracket	1.423***	1.178***	0.963***	0.977***
	(0.337)	(0.313)	(0.320)	(0.326)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Rating FE	No	Yes	Yes	Yes
Loan controls	No	Yes	No	Yes
Firm controls	No	No	Yes	Yes
N	17,756	17,756	17,756	17,756
$Adj.R^2$	0.15	0.17	0.18	0.18
Mean of dependent variable	3.48	3.48	3.48	3.48

Table IA.7

Robustness for Table 3: CRA–firm fixed effects

Regressions reported in this table are identical to Table 3, except the regressions include CRA–firm fixed effects instead of firm fixed effects. Standalone variables that are not included in the table are absorbed by fixed effects. Reported standard errors in parentheses are heteroscedasticity-robust and clustered by firm. ***$p <0.01$, **$p <0.05$, *$p <0.10$.

	1(downgrade)			
	(1)	(2)	(3)	(4)
Cost of downgrade	-0.144	-0.140	-0.139	-0.152
	(0.255)	(0.251)	(0.243)	(0.255)
Cost of downgrade × 1(decisive rating)	-0.876**	-0.922***	-0.797***	-0.867***
	(0.361)	(0.323)	(0.306)	(0.322)
Firm × CRA FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Rating FE	No	Yes	Yes	Yes
Loan controls	No	Yes	No	Yes
Firm controls	No	No	Yes	Yes
N	20,712	20,712	20,712	20,712
$Adj.R^2$	0.08	0.12	0.12	0.12
Mean of dependent variable	1.83	1.83	1.83	1.83

Table IA.8

Robustness for Table 8: Alternative definition of the commodities shock variable

Regressions reported in this table are identical to Table 8, except that the variable 1(*commodities shock*) is defined to take the value of 1 between 2014Q3 and 2015Q4. Standalone variables that are not included in the table are absorbed by fixed effects. Reported standard errors in parentheses are heteroscedasticity-robust and clustered by firm. ***$p <0.01$, **$p <0.05$, *$p <0.10$.

	1(downgrade)			
	(1)	(2)	(3)	(4)
Cost of downgrade	-0.634**	-0.683***	-0.660***	-0.701***
	(0.246)	(0.223)	(0.216)	(0.221)
1(commodities) × 1(commodities shock)	5.596**	5.683**	3.315	3.132
	(2.473)	(2.388)	(2.389)	(2.395)
Cost of downgrade × 1(commodities) × 1(commodities shock)	-4.872*	-5.094**	-4.789*	-4.603*
	(2.686)	(2.548)	(2.560)	(2.538)
1(commodities shock)	0.184	-0.008	0.122	0.098
	(0.746)	(0.715)	(0.741)	(0.741)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Rating FE	No	Yes	Yes	Yes
Loan controls	No	Yes	No	Yes
Firm controls	No	No	Yes	Yes
Other interactions	Yes	Yes	Yes	Yes
N	20,798	20,798	20,798	20,798
$Adj.R^2$	0.08	0.10	0.11	0.11
Mean of dependent variable	2.40	2.40	2.40	2.40

Table IA.9

Robustness: Additional loan fixed effect regressions

This Table shows OLS regressions identical to the most complete specifications in Tables 6, 7, and 10, except that the regressions include loan fixed effects. Standalone variables that are not included in the table are absorbed by fixed effects. All specifications include firm-level controls, as well as current credit rating, year, and loan fixed effects. Firm-level controls include size, profitability, asset tangibility, and leverage. A detailed description of all variables is available in Appendix A. Reported standard errors in parentheses are heteroscedasticity-robust and clustered by firm. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$.

	1(downgrade)				
	Table 6	Table 7			Table 10
	(1)	(2)	(3)	(4)	(5)
Cost of downgrade	-1.332**	-2.248***	-1.279**	-1.702**	-1.731***
	(0.622)	(0.681)	(0.651)	(0.763)	(0.571)
Cost of downgrade × 1(commodities) × 1(commodities shock)	-3.593**				
	(1.626)				
Cost of downgrade × 1(high intangibles)		1.134			
		(0.875)			
Cost of downgrade × 1(high R&D)			-1.590		
			(1.306)		
Cost of downgrade × 1(border junk)				0.253	
				(1.117)	
Cost of downgrade × 1(post settlement)					0.166
					(0.639)
1(high intangibles)		2.161*			
		(1.163)			
1(high R&D)				-3.408*	
				(2.055)	
Loan FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes
N	20,736	20,736	20,736	20,736	20,736
$Adj.R^2$	0.11	0.11	0.11	0.11	0.08
Mean of dependent variable	2.39	2.39	2.39	2.39	1.50

15

Table IA.10

Robustness for Columns (1) and (2) of Table 7: Continuous proxies for firm opaqueness

Regressions reported in this table are identical to those in Columns (1) and (2) of Table 7, except the regressions include continuous variables for the firm's intangibles divided by total assets and log(R&D) instead of indicator variables. Reported standard errors in parentheses are heteroscedasticity-robust and clustered by firm. ***$p <0.01$, **$p <0.05$, *$p <0.10$.

	1(downgrade)	
	(1)	(2)
Cost of downgrade × Intangibles over assets	0.770	
	(1.375)	
Cost of downgrade × log(R&D)		0.039
		(0.115)
Cost of downgrade	-0.965***	-1.149***
	(0.259)	(0.418)
Intangibles over assets	-7.842*	-10.684**
	(4.133)	(5.406)
log(R&D)		0.358
		(1.378)
Firm FE	Yes	Yes
Year FE	Yes	Yes
Rating FE	Yes	Yes
Loan controls	Yes	Yes
Firm controls	Yes	Yes
N	20,725	9,746
$Adj.R^2$	0.14	0.13
Mean of dependent variable	2.93	3.04

Table IA.11

Robustness for Column (3) of Table 7: Alternative definitions of the border junk variable

Regressions reported in this table are identical to those in Column (3) of Table 7, except the regressions include alternative definitions of 1(*border junk*). 1(*border junk*) (2*notches*) is an indicator that takes the value of 1 if the firm is rated BBB- or BBB (i.e., one or two credit rating notches above the non-investment grade classification threshold). 1(*border junk*)(3*notches*) is an indicator that takes the value of 1 if the firm is rated BBB-, BBB, or BBB+. 1(*border junk*)(4*notches*) is an indicator that takes the value of 1 if the firm is rated BBB-, BBB, BBB+, or A-. Standalone variables that are not included in the table are absorbed by fixed effects. Reported standard errors in parentheses are heteroscedasticity-robust and clustered by firm. ***$p <0.01$, **$p <0.05$, *$p <0.10$.

	1(downgrade)		
	(1)	(2)	(3)
Cost of downgrade	-0.599**	-0.613**	-0.917*
	(0.247)	(0.258)	(0.485)
Cost of downgrade × 1(border junk) (2 notches)	-0.636		
	(0.509)		
Cost of downgrade × 1(border junk) (3 notches)		-0.539	
		(0.483)	
Cost of downgrade × 1(border junk) (4 notches)			0.105
			(0.521)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes
Loan controls	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes
N	20,725	20,725	20,725
$Adj.R^2$	0.14	0.14	0.14
Mean of dependent variable	2.93	2.93	2.93

Table IA.12

Credit rating reversals and cost of downgrade

The dependent variable is an indicator that takes the value of 1 if a firm experiences a credit rating change that offsets the last change (i.e., either an upgrade followed by a downgrade or vice versa). The indicator is multiplied by 100 so that regression coefficients are in percentage points. The independent variable of interest is *cost of downgrade*, a measure of the increase in loan spread that would result from a credit rating downgrade of one notch. The variable is standardized so that regression coefficients reflect the impact of changing the variable by one standard deviation. Loan- and firm-level controls, as well as current credit rating, year, and firm fixed effects are included as reported. Loan-level controls include loan type, amount, number of financial covenants, whether the loan is secured, and deal purpose. Firm-level controls include size, profitability, asset tangibility, and leverage. A detailed description of all variables is available in Appendix A. Reported standard errors in parentheses are heteroscedasticity-robust and clustered by firm. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$.

	1(reversal)			
	(1)	(2)	(3)	(4)
Cost of downgrade	0.005	0.006	0.003	0.005
	(0.006)	(0.005)	(0.003)	(0.004)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Rating FE	No	Yes	Yes	Yes
Loan controls	No	Yes	No	Yes
Firm controls	No	No	Yes	Yes
N	20,725	20,725	20,725	20,725
$Adj.R^2$	0.01	0.01	0.01	0.01
Mean of dependent variable	0.02	0.02	0.02	0.02

18

Table IA.13

Robustness for Table 9

Regressions reported in this table are identical to Table 9, except the variable for the average cost of a downgrade is computed as the average increase in interest rates after a downgrade by one notch across all levels of the initial loan contract (as opposed to the realized avgerage cost of a downgrade over the lifetime of the loan). Reported standard errors in parentheses are heteroscedasticity-robust and clustered by firm. ***$p <0.01$, **$p <0.05$, *$p <0.10$.

	Loan spread			
	(1)	(2)	(3)	(4)
Avg. cost of downgrade	4.806***	4.060***	4.393***	4.011***
	(0.447)	(0.379)	(0.396)	(0.381)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Rating at origination FE	No	Yes	Yes	Yes
Loan controls	No	Yes	No	Yes
Firm controls	No	No	Yes	Yes
N	1,736	1,732	1,735	1,732
$Adj.R^2$	0.76	0.81	0.80	0.81
Mean of dependent variable	111.91	111.78	111.96	111.78

Table IA.14

Traded versus non-traded loans

This table compares the subsample of traded loans in the sample with the matched non-traded loans across observable characteristics. The non-traded loans are selected so that they resemble the traded loans using a nearest neighbor matching framework based on firm characteristics (current credit rating, size, profitability, asset tangibility, and leverage) and loan characteristics (amount, number of financial covenants, and whether the loan is secured or not). Observations are at the loan level. $1(\cdot)$ denotes indicator variables. Statistical significance computations are based on heteroscedasticity-robust standard errors clustered by firm. ***$p <0.01$, **$p <0.05$, *$p <0.10$.

	Mean		Difference
	Traded	Not traded	
Leverage	0.35	0.35	0
Total assets (log)	9.37	9.32	0.05
Intangibles over assets	0.28	0.27	0.01
Profitability (ROA)	0.03	0.02	0.01
Issuer credit rating (numeric)	10.05	10.09	-0.04
Number of financial covenants	1.57	1.56	0.01
Loan amount ($ millions)	1339	1317	21
1(secured)	1.17	1.17	0
N	75	75	

Table IA.15

Traded loans in sample versus traded loans not in sample

This table compares the subsample of traded loans in the sample with the remaining traded loans in LPC across observable characteristics. Observations are at the loan level. $1(\cdot)$ denotes indicator variables. Note, since LPC does not provide a firm identifier for all traded loans, standard errors are not clustered. ***$p <0.01$, **$p <0.05$, *$p <0.10$.

	Mean		
	In sample	Not in sample	Difference
Initial quote (mid spread)	98.3	94.9	3.38
Standard deviation of quotes	1.19	3.93	-2.73
Number of quotes	1.51	2.23	-0.71***
N	75	27,054	

Table IA.16

Traded loans versus remaining PSD loans

This table compares the subsample of traded loans in the sample with the remaining loans across observable characteristics. Observations are at the loan level. 1(·) denotes indicator variables. Statistical significance computations are based on heteroscedasticity-robust standard errors clustered by firm. ***$p <0.01$, **$p <0.05$, *$p <0.10$.

	Mean		
	Traded	Not traded	Difference
Leverage	0.35	0.32	0.03
Total assets (log)	9.37	9.09	0.29
Intangibles over assets	0.28	0.20	0.08
Profitability (ROA)	0.03	0.03	0.00
Issuer credit rating (numeric)	10.05	8.62	1.43**
Number of financial covenants	1.57	1.46	0.11
Loan amount ($ millions)	1339	875	464**
1(secured)	1.17	1.15	0.02
N	75	1,739	