



The Value of Ratings: Evidence from their Introduction in Securities Markets

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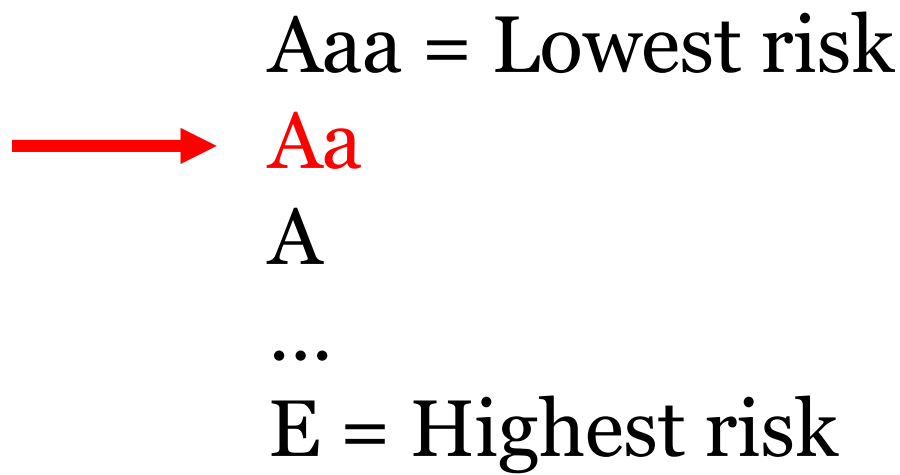


Motivation

First party to examine effect of one of the most important financial innovations in U.S. history:

1909 watershed establishment of third-party risk assessments centered around partitioned letter-graded securities ratings

428 POOR'S MANUAL OF RAILROADS—CENTRAL NORTHERN GROUP.		429 POOR'S MANUAL—ILLINOIS CENTRAL RR. CO.					
General Balance Sheet, June 30, 1907.							
Railroads and Equipment	4,874,910	4,874,910	4,874,910				
Passenger Train Miles	10,970,817	10,970,817	10,970,817				
Freight Train Miles	17,078,817	17,078,817	17,078,817				
Work Train Miles	1,581,728	1,581,728	1,581,728				
Capital Stock	60,000,000	60,000,000	60,000,000				
Leased Line Stock	10,000,000	10,000,000	10,000,000				
Preferred Dividend	1,500,000	1,500,000	1,500,000				
St. L., A. & T. P. E. Lines	2,000,000	2,000,000	2,000,000				
Revenue Fund Assets	2,500,000	2,500,000	2,500,000				
Total Assets	82,678,346	82,678,346	82,678,346				
Operations, Property and General Balances—Statement showing the results from operation, the statistics of mileage and equipment, and the general balances of the company for seven fiscal years ending June 30:							
	1901	1902	1903	1904	1905	1906	1907
Miles Road Operated	4,874,910	4,874,910	4,874,910	4,874,910	4,874,910	4,874,910	4,874,910
Passenger Train Miles	10,970,817	10,970,817	10,970,817	10,970,817	10,970,817	10,970,817	10,970,817
Freight Train Miles	17,078,817	17,078,817	17,078,817	17,078,817	17,078,817	17,078,817	17,078,817
Work Train Miles	1,581,728	1,581,728	1,581,728	1,581,728	1,581,728	1,581,728	1,581,728
Capital Stock	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000
Leased Line Stock	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
Preferred Dividend	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000
St. L., A. & T. P. E. Lines	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Revenue Fund Assets	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000
Total Assets	82,678,346	82,678,346	82,678,346	82,678,346	82,678,346	82,678,346	82,678,346





Securities Ratings



Then...

Fertile grounds (e.g., Sylla '02)

- Traded bonds primary financing of RRs (& other large firms)
- (Small) investors wanting to level the playing field

Catches on (e.g., White '13)

- Moody '09, Standard '16, Poor's '22, Fitch '28
- By '28 98% of U.S. corporate debt is rated

Transforms market (e.g., Harold '38; Bernstein '19)

- '20s Increasing usage
- '30s regulations tied to ratings & reliance grows from there...

Securities Ratings



Now...

Ubiquitous (S&P Global; SEC '20)

- \$15 **Trillion** in global corporate debt rated by S&P
- \$7 Billion in rating agency revenue in 2019
- Intertwined w/ implicit/explicit investment mandates

Big effects on markets/prices/firms (e.g., Tang '09,...)

- Even tho based on public info! (Benmelech 2017)
- But limited production of info outside ratings (White 2010; Dang et al., 2020; Hanson and Sunderam, 2013)
- Just the mandates OR do ratings distill info better?

Identification Challenge

- Consider firm with Baa rated bonds
- If fall to Ba (below “investment grade”)...
 - ...covenants mean rates on existing bonds rise
 - ...many investors can’t buy raising rates on new bonds
 - ...feedback loop amplifying initial effects
- Bonds are put on credit watch (risk of lower rating)
 - Prices fall because higher mandate-driven “risks”
 - Even tho no direct effect cause rating hasn’t changed
- **Since 20s/30s any non-mandate effects of ratings fundamentally not-identifiable**



Motivation

An overwhelmingly massive literature

- But almost all >1920s
- Those prior focused on what drove ratings

First paper to examine *effect* of introduction of one of the most important financial innovations in U.S. history

...AND...

to analyze effects of ratings in the absence of demand effects (information provision)

Advantages of the Historical Context

- 1) No ratings-based regulations or investment mandates of any kind
- 2) 1909 ratings created for idiosyncratic reasons; not anticipated by investors and not a response to rising demand
- 3) No 'issuer-pays' business model; book of ratings was offered for sale to investors
- 4) Bonds listed on the NYSE at the time; can observe prices of bonds before and after ratings introduced
- 5) Can also observe information available to investors at the time from easily accessible sources

Data Description

Large hand-collection effort:

- **Bond prices:** Weekly closing prices for all bonds traded on New York Stock Exchange (virtually all big bonds!) from Monday edition of New York Times in 2 years around April 1909 ratings introduction
- **Bond bid/ask:** Digitized from New York Stock Exchange Archives quotation sheets with bid-ask spreads for all traded securities at 11am on Weds at a weekly frequency for 12 weeks around ratings release
- **Bond transaction-level:** Weekly transaction-level (price and size) from New York Times for all NYSE traded bonds on Wednesdays for 12 weeks around ratings release
- **Ratings/financial info:** Bond/firm/ratings for all bonds included in the Moody's or competing (e.g., Pooors) investor manuals

Main Findings

1) The ratings were largely explainable w/ public info

- Data used were public/stale (avgs over 10 yrs as of prior year) (Consistent w/ Wilson '11)

2) Despite that, negative “surprise” ratings moved bond prices/yields

- In DiD design, bond yields of firms with ratings worse than implied by market yields rose
- Consistent w/ rising cost of capital

3) Effects concentrated among firms w/ worse reputation

- Disappears if many bankers on their board

4) Being rated improved market liquidity

- Different design: IV based on Moody's ratings methodology
- Receiving a rating (instrumented) reduced bid-ask spreads

5) Being rated led to entry by smaller investors

- Same IV design
- Receiving a rating (instrumented) led to more small trades
- Consistent w/ improving market access to for smaller investors

Historical Background – Early Bond Markets

Basic facts:

- Large (clearly ratings not necessary for market to develop)
- Dominated by **railroads**
- Relatively illiquid (trading dominated by small number of well-known issues)

Bonds listed on NYSE; significant share of trading by retail investors

Par value of most bonds \$1,000 – accessible only to the very wealthy (and institutions)

Main source of information: “Investor manuals”

- Published by several competing firms (Standard Statistics, Poors, Moodys)
- Present condensed financial statements, descriptions of all outstanding securities
- Intended for sophisticated users (no explanations or evaluations provided)

Evaluating Bonds c. 1909

Reference guides for investors discuss factors such as yield, quality of collateral, and financial ratios:

“A first-class bond investment necessitates that a road should earn double its fixed charges” (*The Bond Buyer's Dictionary*, 1907)

“From 60 to 65 percent of the profits should pay all fixed charges, that is to say, taxes and interest on the funded debt” (*How Money Is Made In Security Investments*, 1906)

“Earning capacity well in excess (50 percent at least) of all requirements for interest on the mortgage” (*The Art of Wall Street Investing*, 1906)

Calculations not provided and would require some effort

Also, no clear indication of how to distinguish the ‘exceptional’ from the merely ‘good’, or the ‘OK’ from the ‘not-so-good’



John Moody and Ratings

1880s/1890s: Rises ranks of Spencer Trask, becoming the head of research

1900: Founds “Moody Manual Company” producing & selling investor manuals

- Business is successful and expands, producing a magazine, books on how to value securities (presenting methods he would use in creating his ratings)
- Builds a printing plant in New Jersey w/ large fixed costs.

1907: Goes bankrupt after Panic of 1907, sells his business to a competitor – which continues to use the “Moody’s” name & publish manuals

1908: starts new business (“Analyses Publishing Co”) with a novel strategy focused on analyzing and **rating securities**, rather than only compiling information, in competition with his former firm

First Ratings Volume: Basic Facts

Published April 1909, rated most railroad bonds; initially updated annually

Begins with lengthy discussion of methodology, and presents detailed data underlying the ratings for each railroad

Volume sold to investors: volume printed in both U.S. and U.K.; price of U.S. edition, \$12.50 (\$367 today) (similar to other investor manuals)

Like other manuals: marketed to financial institutions (via ads in financial press)

Unlike other manuals: also marketed to retail investors (via ads in *New York Times*)

Typical 'Investor Manual'

10. Operations, Property and General Balances.—Statement showing the results from operation, the statistics of mileage and equipment, and the general balances of the company for seven fiscal years ending June 30:

	1901	1902	1903	1904	1905	1906	1907
Miles Road Operated....	4,214.92	4,276.23	4,292.98	4,340.35	4,373.91	4,423.87	4,370.77
Passenger Train Miles....	10,824,720	10,449,394	10,794,544	10,827,134	11,169,880	11,888,699	12,077,885
Freight Train Miles....	17,076,817	15,689,534	17,483,072	18,320,526	16,950,494	17,209,387	17,846,876
Mixed Train Miles*.....		514,895	479,438	476,506	476,188	430,192	283,303
Total Revenue Mileage	27,901,537	26,653,823	28,757,054	29,624,166	28,596,562	29,028,278	30,208,064
Passengers Carried.....	17,865,439	19,006,204	21,231,607	22,563,613	21,645,601	22,052,673	23,441,337
Passenger Mileage.....	373,919,236	401,309,425	455,432,129	485,092,114	583,481,895	511,391,077	569,931,666
Freight (tons) Moved....	17,735,749	19,096,441	21,881,870	22,420,814	23,148,309	25,641,146	26,922,868
Freight (ton) Miles.....	4,016,085,602	4,452,073,927	5,176,543,778	5,221,132,514	5,559,139,454	6,230,593,529	6,592,022,619
Passenger Earnings.....	\$ 7,327,742	\$ 8,020,649	\$ 8,977,238	\$ 9,554,743	\$ 10,729,825	\$ 10,004,441	\$ 11,187,533
Freight Earnings.....	24,870,339	27,710,782	30,592,094	31,692,575	32,607,922	34,637,124	38,093,270
Other Earnings.....	4,696,379	5,089,599	5,616,755	5,583,818	6,170,903	6,995,240	7,889,830
Gross Earnings.....	36,900,460	40,821,030	45,186,077	46,831,136	49,508,650	51,636,405	56,610,633
Operating Expenses.....	24,251,677	26,248,123	29,835,883	32,793,251	33,084,258	34,302,477	37,847,707
Net Earnings.....	12,648,783	14,572,907	15,350,194	14,037,885	16,424,392	17,333,928	18,762,926
Other Receipts.....	2,505,182	3,551,806	3,461,147	2,716,549	2,761,507	3,256,989	2,818,575
Net Income.....	15,153,965	18,124,713	18,811,341	16,754,434	19,185,899	20,590,917	21,581,501
Taxes.....	1,590,115	1,766,217	1,862,072	1,942,431	2,027,448	2,134,993	2,217,818
Interest & Sinking Fund	2,980,925	3,719,695	3,049,740	3,481,825	3,938,470	3,974,805	3,969,860
Lease Rentals.....	3,615,265	3,502,669	3,170,136	2,464,250	3,084,639	3,618,780	3,706,732
Dividends.....	(6) 3,780,000	(6) 4,752,000	(6) 5,702,400	(6) 5,702,400	(7) 6,652,800	(7) 6,652,800	(7) 6,652,800
Other Deductions.....	3,145,400	4,340,172	4,981,253	3,115,948	3,439,282	4,164,739	4,987,934
Surplus.....	43,260	43,960	45,740	47,580	43,260	44,800	46,357
Gross Earnings per Mile.	8,754.72	9,546.03	10,525.57	10,789.72	11,319.08	11,672.22	12,952.10
Operating Exp. per Mile..	5,753.77	6,138.15	6,949.92	7,555.44	7,564.00	7,753.95	8,659.28
Net Earnings per Mile...	3,000.95	3,407.88	3,575.65	3,234.28	3,755.08	3,918.27	4,292.82
Expenses to Earnings....	65.72 p. c.	64.30 p. c.	66.03 p. c.	70.02 p. c.	66.82 p. c.	66.43 p. c.	66.86 p. c.
Av. Rate p. Pass. p. Mile	1.960 c.	1.999 c.	1.971 c.	1.970 c.	1.839 c.	1.956 c.	1.963 c.
Av. Rate p. Ton p. Mile..	0.619 c.	0.622 c.	0.591 c.	0.607 c.	0.587 c.	0.556 c.	0.577 c.
Miles of Road.....	4,265.50	4,283.90	4,301.10	4,373.72	4,374.04	4,459.14	4,377.44
Miles of Track.....	5,936.34	6,189.13	6,339.86	6,616.00	6,672.39	6,830.66	6,797.77
Miles of Steel Rail.....	5,936.34	6,189.13	6,339.86	6,616.00	6,672.39	6,830.66	6,797.77
Locomotives.....	891	947	1,003	1,086	1,158	1,193	1,240
Passenger Train Cars....	725	726	753	787	802	813	859
Freight Train Cars.....	38,498	42,419	51,911	53,576	54,764	56,227	57,601
Work Train Cars.....	462	469	645	1,446	1,765	2,026	2,376
Capital Stock.....	\$ 66,000,000	\$ 79,200,000	\$ 95,040,000	\$ 95,040,000	\$ 95,040,000	\$ 95,040,000	\$ 95,040,000
Leased Line Stock.....	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
Funded Debt.....	128,797,925	129,195,925	129,203,525	141,372,275	143,872,275	144,894,275	146,053,275
September Dividend...	1,980,000	2,376,000	2,851,200	2,851,200	3,326,400	3,326,400	3,326,400
Net Current Liabilities..	3,820,473			5,008,060		2,252,994	10,988,135
St. L., A. & T. H. Lines.				3,328,300		3,328,300	3,328,300
Reserve Funds.....	3,316,523	3,084,621	3,070,059	3,083,038	3,671,946	4,704,170	4,096,275
Profit and Loss.....	2,960,960	3,010,960	3,160,960	3,160,960	3,160,960	3,160,960	4,160,960
Total Liabilities.....	216,875,881	226,867,506	243,325,744	263,843,833	262,399,881	266,707,099	276,973,345
Road and Equipment....	160,065,494	168,852,194	175,320,981	184,736,442	190,622,249	191,480,157	192,313,362
Real Estate.....	321,864	313,521	312,136	324,161	321,900	324,151	315,479
Materials and Supplies..	2,498,695	2,034,279	2,208,097	2,774,370	2,412,510	2,932,657	3,735,246
Securities Owned.....	44,705,353	46,225,130	49,225,687	65,369,984	54,812,504	60,315,549	65,609,955
Construction Advances.	6,620,889	6,814,089	6,786,514	4,227,538	910,290	3,622,115	7,581,729
Net Current Assets.....		3,907,069	6,563,602		6,320,182		
St. L., A. & T. H. Lines.				3,328,300	3,328,300	3,328,300	3,328,300
Reserve Fund Assets....	2,663,586	2,721,224	2,908,727	3,083,038	3,671,946	4,704,170	4,096,274
Total Assets.....	216,875,881	226,867,506	243,325,744	263,843,833	262,399,881	266,707,099	276,973,345

Illinois Central Bonds; total, \$129,818,275.

\$2,500,000 1st mtge. sterling 6s extended as gold 4s of 1951, dated April 1, 1875, due April 1, 1895, extended to April 1, 1951, interest April 1 and Oct. 1, at office of Chaplin, Milne, Grenfell & Co., London, Eng. Coupon bonds, £200 each. Secured by first mortgage (equally with the bonds cured by the following five paragraphs) on the described in the following five paragraphs) on the lines from Chicago to Cairo, Ill., 364.73 miles, and from Centralia, Ill., to Dubuque, Ia., 340.77 miles, from Centralia, Ill., to Dubuque, Ia., 340.77 miles, in all, 705.50 miles. Trustee: United States Trust Co., New York, N. Y.

\$1,000,000 1st mtge. sterling 5s extended as gold 4s, dated Feb. 16, 1876, due Dec. 1, 1905, extended to Dec. 1, 1950. Interest payable June 1 and Dec. 1, at the office of Morton, Coppell & Co., London, Eng. Coupon bonds, £200 each. Secured by first mortgage equally with and upon the same property as the 4 p. c. sterling bonds of 1951. Trustee: United States Trust Co., New York, N. Y.

\$1,500,000 1st mtge. gold 4s of 1951, dated Jan. 1, 1886, due Jan. 1, 1951, interest Jan. 1 and July 1, at the company's office, New York, N. Y. Coupon bonds, \$1,000 each, registerable as to principal or convertible into fully registered bonds. Secured by first mortgage equally with and upon the same first mortgage equally with and upon the same first property as the 4 p. c. sterling bonds of 1951. Trustee: United States Trust Co., New York, N. Y.

\$2,499,000 1st mtge. gold 3½s of 1951, dated Jan. 1, 1886, due Jan. 1, 1951, interest Jan. 1 and July 1, at the company's office, New York, N. Y. Coupon bonds, \$1,000 each, registerable as to principal or convertible into fully registered bonds. Secured by first mortgage equally with and upon the same property as the 4 p. c. sterling bonds of 1951. Trustee: United States Trust Co., New York, N. Y.

\$2,500,000 1st mtge. sterling 3s of 1951, dated Aug. 31, 1895, due March 1, 1951, interest March 1 and Sept. 1, at the office of Chaplin, Milne, Grenfell & Co., London, Eng. Coupon bonds, £200 each, registerable as to principal or convertible into fully registered bonds. Secured by first mortgage equally with and upon the same property as the 4 p. c. sterling bonds of 1951. Trustee: United States Trust Co., New York, N. Y.

\$3,000,000 1st mtge. sterling 5s extended as gold 3½s of 1951, dated March 30, 1903, due April 1, 1951, interest April 1 and Oct. 1, at London, Eng., or at the company's office, New York, N. Y. Coupon bonds, \$1,000 each, registerable as to principal or convertible into fully registered bonds. Secured by first mortgage equally with and upon the same property as the 4 p. c. sterling bonds of 1951. Trustee: United States Trust Co., New York, N. Y.

\$968,000 Kankakee & Southwestern RR. 1st mtge. 5 p. c. bonds, dated Aug. 1, 1881, due Aug. 1, 1921, interest Feb. 1 and Aug. 1, at the company's office, New York, N. Y. Registered bonds, \$1,000 each. Secured by first mortgage on the lines from Otto to Normal Junction, Ill., 79.46 miles, from Kempton Junction to Kankakee Junction, Ill., 41.8 miles, and from Buckingham to Tracy, Ill., 10 miles—a total of 131.26 miles. Trustees: J. V. F. Randolph and Stuyvesant Fish.

\$5,266,000 sterling 3½s of 1950, dated July 21, 1886, due July 1, 1950, interest Jan. 1 and July 1, at the office of Baring Bros., London, Eng. Coupon bonds, £200 each. Secured by deposit of an equal amount of 5 p. c. gold bonds of the C., St. L. & N. O. RR., secured under its mortgage of March 15, 1881, which are to be delivered to the holders of the 3½ p. c. bonds in case of default. In the trust agreement it is provided that no mortgage shall be made on the Illinois Central RR., or the C., St. L. & N. O. RR., until these bonds are secured on those roads by a lien prior to such mortgage. Trustee: United York, N. Y.

\$15,000,000 Gold 4s of 1888, due April 1, 1952, interest at the company's office, New York, N. Y. Coupon bonds, \$500 and \$1,000, registerable or convertible into fully registered bonds by deposit of 1st mtge. bonds as follows: Canton, Aberdeen (87.89 m.) 1st mtge. 5 p. c. of 1, 1952, \$1,750,000; Yazoo RR. (140.36 m.) 1st mtge. of June 1, 1952, \$2,800,000; Western RR. (131.62 m.) 1st bonds of Dec. 1, 1926, \$2,500,000 and Northern RR. (225.11 47½-yr. bonds of Dec. 1, 19 RR. (74.43 m.) 1st mtge. of June 1, 1927, \$1,000,000; C. (155.58 m.) 1st mtge. 5 p. c. of 1, 1935, \$3,100,000; Cedar 1 (41.85 m.) 1st mtge. 5 p. c. of 1, 1935, \$530,000—total, interest, \$817,500. This interest Illinois Central and credited to the Illinois Central and Miscellaneous 1 States Trust Co., New York, N. Y.

\$3,000,000 Cairo Bridge June 1, 1892, due Dec. 1, 1951, at the company's office, New York, N. Y. Coupon bonds, \$1,000 each, registerable or convertible into fully registered bonds by deposit of the 1st mtge. 5 p. c. Cairo Bridge St. Louis and New Orleans secured, by deed of trust to Co. of New York, trustee, RR. Co.'s interest in the approach thereto on the Illinois Central and the Kentuck built by the Chicago, St. RR. Co.; the Illinois and Illinois Central RR. Co. tucky approach are leased RR. Co. until the year 228 of \$180,000, payable in mortgage of the Chicago, leans RR. Co. provides for rental of the interest on the mortgage, the remainder until Dec. 1, 1901, for the tinent fund available in bridge. From and after the annuum of this remainder sinking fund for the retire Louis and New Orleans bonds at their maturity, 000 of annual rental is to making up the entire case it falls below that sum trustees of the Cairo BR for the contingent fund, ing fund and \$193,287.43 directors of the Chicago, leans RR. Co.

\$25,000,000 Gold 4s 1892, due Nov. 1, 1953, at the company's office, New York, N. Y. Coupon bonds, \$500 and \$1,000, registerable or exchangeable for fully by deposit of bonds of the and Texas Ry. (798 m.) (entire issue) 1st gold 4s 000 (entire issue) 2d cur

New "Ratings" Manual

TABLE D.—Bond Record and Ratings (Based on 10-Year Results, Per Mile of Road).

Explanation: Interest Payable, Maturity, Lien on Miles, and Interest Required per mile of System, are self-explanatory. Average Income Available is the average amount indicated by the record per mile from which payment may be made for interest on the issue, after all prior charges are deducted. Prior liens usually have (after taxes) the first and exclusive claim to the surplus; junior liens must often share their claim with other issues (see explanatory chapters). The prior or joint claim is indicated in the record below. Factor of Safety here indicates the percentage of surplus remaining after payment of interest on the issue, and of other issues having an equal claim on the surplus. The Net Rating is based on the average showing for security made, and the saleability as recorded in the Markets. For General Key to all ratings see page 193. The Price Range covers the calendar years. For Stock Ratings and Range of all Stock Prices, see pages 195-206.

NAME OF ISSUE.	Interest Payable.	Maturity.	Lien on Miles.	Average Income Available.	Interest R'q'r'd per Mile of System.	Factor of Safety.	BASIS FOR RATING.		Net Rating.	1908 PRC. RANGE.	
							Security.	Sal'bility.		Low.	High.	Last.
1. Illinois Central Sterling est 6s.....	A&O	Ap 1951	(1st) 706	(Pr) \$4,108	\$24	97%	Very high.	Very high.	Aaa.	98½-107½	107½
2. Illinois Central Sterling 5s.....	J&D	D 1950	(1st) 706		9	97%	" "	" "	Aaa.	.....	.....
3. Illinois Central first 4s.....	J&J	Ja 1951	(1st) 706		14	97%	" "	" "	Aaa.	.....	103½ ^b
4. Illinois Central first 3½s.....	M&S	Mr 1951	(1st) 706		21	97%	" "	" "	Aaa.	91½-93½	93½
5. Illinois Central first 3s.....	M&S	Mr 1951	(1st) 706		18	97%	" "	" "	Aaa.	.....	84
6. Illinois Central first 3½s.....	A&O	Ap 1951	(1st) 706		25	97%	" "	" "	Aaa.	94-94	94
7. Illinois Central Sterling Trust 3½s.....	J&J	Jl 1950	(1st. col)		44	87%	" "	" "	Aaa.	.....	.....
8. Illinois Central Springfield Div. 3½s.....	J&J	Ja 1951	(1st) 111	17	87%	" "	" "	Aaa.	.....	90½ ^b	
9. Kank. & So'w. R. R. first 5s.....	F&A	Ag 1921	(1st) 131	(Jt) 3,999	12	87%	" "	" "	Aaa.	.....	111 ^b
10. Ill. Cent. coll. trust 4s.....	A&O	Ap 1952	(1st) col		144	87%	" "	" "	Aaa.	97-102	101
11. Cairo Bridge Co. first 4s.....	J&D	D 1950	(Bridge)		29	87%	" "	" "	Aaa.	.....	100
12. Ill. Cent. (L. N. O. & T.) Coll. tr. 4s.....	M&N	N 1953	(1st) 798	(Jt) 3,451	240	87%	" "	" "	Aaa.	98½-102	99½
13. Ill. Cent. Western Lines first 4s.....	F&A	Ag 1951	(1st) 218		52	87%	" "	" "	Aaa.	100½-100½	100½
14. Ill. Cent. St. L. Div. & Term. first 3½s.....	J&J	Jl 1951	(1st) 239		70	85%	" "	" "	Aaa.	79½-90½	90½
15. Ill. Cent. St. L. Div. & Term. first 3s.....	J&J	Jl 1951	(1st) 239		36	85%	" "	" "	Aaa.	76½-79½	79½
16. Ill. Cent. Louisville Div. & Term. first 3½s.....	J&J	Jl 1953	(1st) 640		198	85%	" "	" "	Aaa.	85-90½	90½
17. Ill. Cent. Omaha Div. first 3s.....	F&A	Ag 1951	(1st) 131		36	85%	" "	" "	Aa.	.....	79 ^b
18. Ill. Cent. Litchfield Div. first 3s.....	J&J	Ja 1951	(1st) 98		24	85%	" "	" "	Aa.	.....	79½ ^b
19. Ill. Cent. Purchased Lines first 3½s.....	J&J	Jl 1952	(1st) 734	122	85%	" "	" "	Aa.	.....	89 ^b	
20. Belleville & Caron. first 6s.....	J&D	Je 1923	(1st) 17	7	85%	" "	" "	Aa.	.....	109 ^b	
21. Belleville & Eld. first 7s.....	J&J	Jl 1910	(1st) 51	1	85%	" "	" "	Aa.	.....	.....
22. Carb'dale & S'town first 4s.....	M&S	Mr 1932	(1st) 17	2	85%	" "	" "	Aa.	97-100	100	
23. St. Louis Southern first 4s.....	M&S	S 1931	(1st) 33	5	85%	" "	" "	Aa.	98-98	98	
24. Chic. St. L. & N. O. cons. 5s.....	J&D15	Je 1951	} Cons.	2,950	126	.....	" "	" "	Aa.	112½-117	117½ ^b
25. Chic. St. L. & N. O. cons 3½s.....	J&D15	Jl 1951		2,950	12	.....	" "	" "	Aa.	.....	90 ^b
26. Chic. St. L. & N. O. Memphis Div. first 4s.....	J&D	D 1951	(1st) 100	2,950	34	.....	" "	" "	Aa.	100-100	98½ ^b
27. Iowa Falls & Sioux C. first 7s.....	A&O	O 1917	(1st) 184	2,950	47	.....	" "	" "	Aa.	.....	118 ^b

Nos. 20 to 23 underlie jointly secured by one mortgage.

Moody's Ratings

Rating	Description	N	Percent	Mean			
				Factor of Safety (%)	Income Per Mile (000s)	Seniority Rank (1=highest)	Yield to Maturity (%)
Aaa	The highest class...their value is not affected by any normal changes in the earnings capacity of the railroad itself	461	39.47	83.60	58.94	7.69	4.39
Aa	While high-grade...slightly inferior to those having the first rating...in security or in salability	295	25.26	76.79	34.49	10.89	4.45
A	Although high-grade, ...affected, to a partial degree, by changing earning power	238	20.38	70.61	27.59	10.95	4.60
Baa	Generally good, but have a speculative tinge...good but second-grade issues	60	5.14	53.00	26.74	21.67	4.52
Ba	Make a moderately favorable showing and are regarded as well secured, but are affected by changing earning power	52	4.45	54.75	14.06	14.96	4.90
B	More susceptible to fluctuations, and are to be regarded as more speculative in position	35	3.00	44.07	14.22	15.59	4.84
Caa	Almost directly responsive to changes in earning power, and have not had the benefit of available income equal to more than double the interest	4	0.34	25.67	9.54	17.33	5.44
Ca	Approach more strongly to the field of speculative issues with but moderate security	10	0.86	20.00	11.57	16.50	7.13
C	Show but a slight margin in surplus above the amount required for their interest, and which are not well secured	8	0.68				
D	Of doubtful character and almost purely speculative value	3	0.26				
E	Defaulted issues..awaiting the results of reorganizations	2	0.17				

Pairwise Correlations

Correlations (firm-level)	Rating (Aaa=1)	Factor of Safety	Avg. Income	Salability (high=1)	# Bankers on Board	# of Bonds	Bid-Ask Spread	Pre-Period YTM (mean)
Rating	1							
Factor of Safety	-0.75	1						
Avg. Income	-0.43	0.32	1					
Salability	0.67	-0.44	-0.21	1				
# Bankers on Board	-0.09	-0.002	0.22	0.01	1			
# of Bonds	-0.18	0.42	0.04	0.04	0.11	1		
Bid-Ask Spread	0.23	0.10	-0.23	0.36	-0.13	0.14	1	
Pre-Period YTM	0.74	-0.49	-0.34	0.43	-0.22	-0.01	0.27	1

Combinations of these factors explain more than 80% of variation in ratings

- Ratings to a large extent repackaged existing publicly available information—70 to 98% correlation with metrics from other manuals

Ex-post, ratings related to default

- Hickman (1958) found lower default rates in the four strongest categories relative to others

Reception

Contemporary reviews:

“Ingenious, painstaking and authoritative...The bond ratings are unique for a work of this character. Though of necessity **merely opinions**, they come from one of the soundest sources, and have the merit of being **presented along with the facts that gave rise to them.**” (*American Review of Reviews*)

“With the **exception of certain transitory and confidential information which [private bankers] would probably possess**, the record in this book is as complete as need be, and the book is far better adapted for the use of the intelligent private investor than is any railway manual.” (*Railroad Age Gazette*)

Later accounts:

“In no circles has the attitude toward bond ratings been more hostile than among the investment bankers... [...] the existence of the ratings tend to **narrow the price spread between trading points** and facilitate the valuation of bonds by investors.” (Harold, 1938)

Harold also notes that retail investors quickly became “dependent on ratings almost exclusively.”

Moody himself (1933) stated that his ratings “**raised a storm of opposition**” because they “**acted as brakes on the speculative profits** [of sophisticated investors]”

1) Did the Introduction of Ratings
Affect Yields?

Effect of Ratings' Surprises on Yields

- Focus on cases where ratings conveyed information that differed from investors' expectations
- Construct a market-based measure of ratings' surprises, based on yields
 - For each RR, calculate median yield for pre-rating period
 - Sort RRs into yield quartiles
 - Calculate median rating in each quartile
 - Designate RRs whose ratings were lower than median rating of RRs in same quartile as having had a negative surprise
- Investigate whether RRs with negative surprises saw their yields increase after the introduction of ratings
 - Focus is on analysis at the level of the RR: more robust (lots of observations per RR). We also do the same test at the bond level
 - Design motivated by history (more on that soon)

Yield Quartiles

Pre-Rating Yield Quartile	Minimum Yield	Maximum Yield	Mean Yield	Percent Aaa	Percent Aa	Percent A	Percent Baa Or Lower	Mean Rating (1=Aaa)	Median Rating
1	0.036	0.041	0.040	0.838	0.121	0.000	0.040	1.242	Aaa
2	0.041	0.043	0.042	0.448	0.391	0.161	0.000	1.713	Aa
3	0.044	0.046	0.045	0.225	0.287	0.287	0.200	2.587	Aa
4	0.046	0.065	0.050	0.148	0.205	0.261	0.386	3.466	A

Row 3: Bonds with yields of [4.4%-4.6%]

Narrow distribution of pre-ratings yields within quartile suggests that market regarded those bonds and railroads to be of similar risk.

Yet variation in Moody's ratings within quartile:

- Median rating: Aa
- 49% rated A or lower (negative surprise)

Empirical Design

Capture convergence in yields within ratings levels:

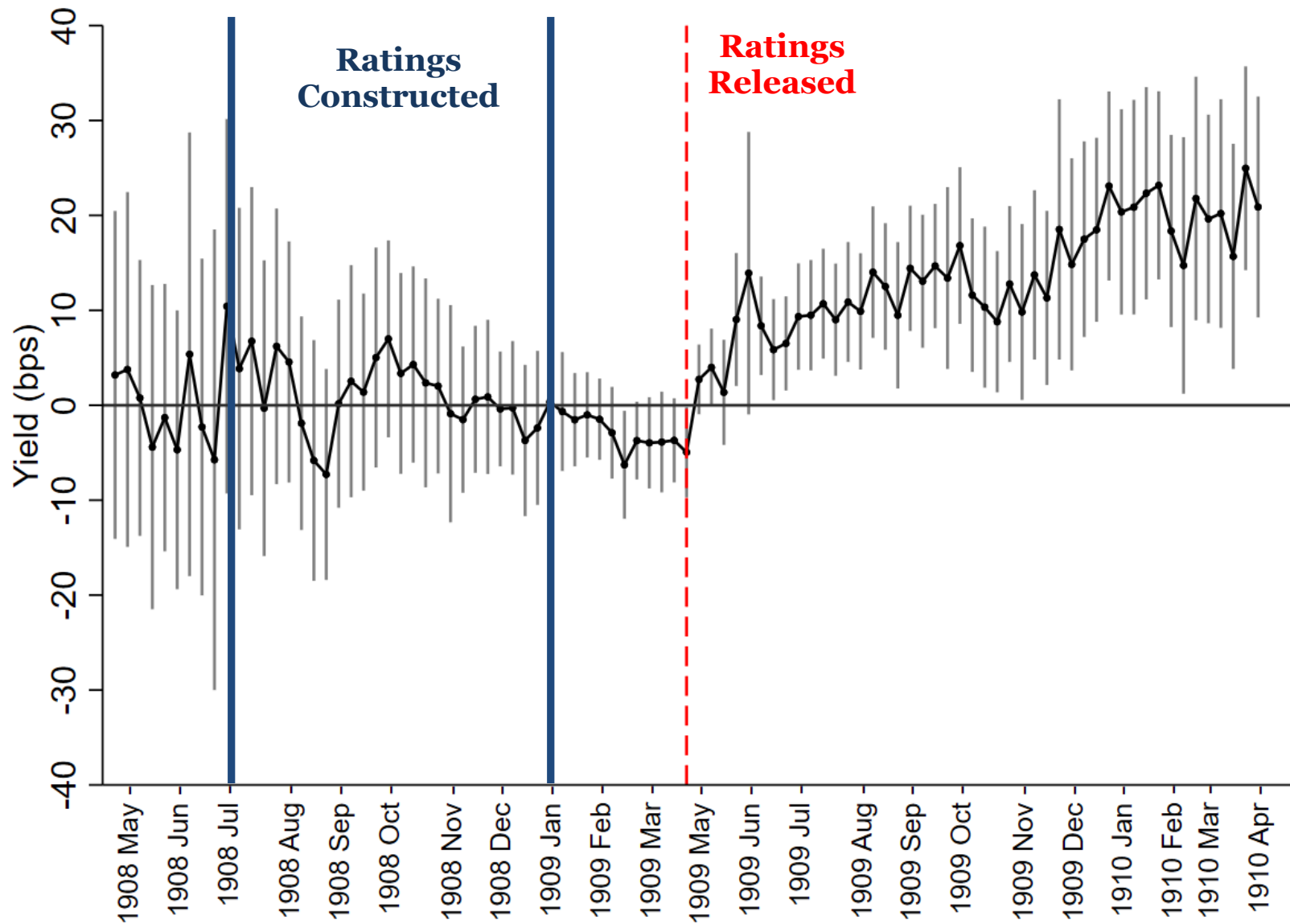
$$y_{ijt} = \alpha_i + \gamma_t + \delta_1 \text{negsurprise}_{jt} \times \text{postRatings}_t + \sum_n \pi_n \text{RatingLevel}_{ni} \times \text{trend}_t + \epsilon_{it},$$

where $i = \text{bond}$, $j = \text{railroad}$, $t = \text{week}$


Compares bonds with same rating, but for one it was a negative surprise, whereas for the others it was not

- Mimics approach of popular investment magazine, The Ticker
- As robustness, also implement specification where yield quartile times trend is controlled for – compares bonds of the same yields, but for one the rating was a negative surprise]

Effects of Negative 'Surprise'



THE TICKER AND INVESTMENT DIGEST



Studies in Stock Speculation

By Rollo Tape

The "Bond Buyer's Guide"

Future of American Beet Sugar

How to Select Investments

By William Walker

Mistakes and Difficulties of Speculators

By Thomas F. Woodlock

Railroad Earnings

By Roger W. Babson

Lab cover in.

MONTHLY
25c

NOVEMBER, 1909

BY THE YEAR
\$3.00 IN ADVANCE

THE TICKER PUBLISHING COMPANY

U. S. EXPRESS BUILDING, 2 RECTOR STREET

VOL. 5

NEW YORK

No. 1

The Ticker, November 1909

The Bond Buyer's Guide

Showing Relative Cheapness of Principal Railroad Issues Listed on the New York Stock Exchange

THE selection of bonds for investment is a subject which puzzles some of the wisest investors. Which issues are best suited to individual requirements and which of these yield the highest income? That is the question.

In the following table we have arranged the principal issues in which round lot transactions took place on the New York Stock Exchange during the week ending October 9th, income being figured at the latest selling price. Ratings are according to classifications given in Moody's "Analyses of Railroad Investments."

These tables will appear regularly and should prove invaluable to all classes of bond buyers, as well as brokers and others who are called upon to recommend or advise on such matters.

Class Aaa—Bonds of the highest grade as regards security and which are also readily convertible into cash. These issues are not likely to be affected by any normal changes in the earning power of their respective roads; their prices are, however, influenced by the rates for money.

Description.	Due.	Interest period.	Price Oct. 9, '09.	Yield.
Southern Pacific 1st G. 4s. (Cent. Pac. Col.)	1949	J — D	92	4.48
Erie, N. Y., L. E. & W. 1st Con. G. 7s.	1920	M — S	121½	4.47
Oregon Short Line Guar. ref. Col. 4s.	1929	J — D	92½	4.46
Lake Shore Deb. 4s.	1928	M — S	95	4.39
Lake Shore Deb. 25-yr. 4s.	1931	M — N	94½	4.38
Southern Pacific Cen. Pac. 30-yr. Guar. G. 2½s	1929	J — D	89	4.33
Chicago, B. & Quincy Joint 4s.	1921	J — J	97	4.32
Rio Grande Western Tr. 1st 4s.	1939	J — J	94½	4.31
Wabash 1st G. 5s.	1939	M — N	102½	4.25
Denver & Rio Grande 1st Con. G. 4s.	1936	J — J	96½	4.22
Reading Co. Gen. G. 4s.	1997	J — J	99	4.15
Central Pac. Ref. 1st 4s.	1949	F — A	97½	4.14
Southern Pacific Central Pac. 1st ref. Guar. G. 4s.	1949	M — S	97½	4.10
Union Pacific 1st ref. 4s.	1908	M — S	97½	4.10
Louisville & Nashville United G. 4s.	1940	J — J	95½	4.04
Nor. & Western Ry. Con. 1st 4s.	1996	A — O	99½	4.04
Illinois Central 1st Col. Tr. 4s.	1953	M — N	99½	4.03
West Shore 1st 4s.	2051	J — J	101	4.00
Chicago, Bur. & Quincy, Ill. Div., 2½s.	1949	J — J	90	4.00
Chicago, St. Paul, M. & Omaha Con. 4s.	1930	J — D	128½	3.97
Atchison, Top. & S. F. Gen. G. 4s.	1995	A — O	100%	3.92

THE BOND BUYER'S CODE

17

Class Aa—Composed of high grade bonds slightly inferior to the above, either as to security or salability or both.

Wabash 2nd G. 5s.	1929	F — A	101½	4.90
Colorado & Southern Ref. & Ex. 4½s.	1985	M — N	97½	4.65
Cent. of Ga. Con. 5s.	1945	M — N	120	4.44
Chicago, Ind. & Louisville Ref. 4s.	1947	J — J	129	4.41
Kansas City Southern 1st G. 5s.	1950	A — O	74½	4.26
Southern Ry. E. T. Va. Cons. 1st G. 5s.	1956	M — N	114½	4.29
Atchison, Top. & S. F. Short Line 4s.	1958	J — J	94½	4.28
N. Y. Central Deb. 4s.	1974	M — N	95½	4.27
Southern Pacific R. R. 1st ref. 4s.	1955	J — J	94½	4.27
Atlantic Coast Con. 1st G. 4s.	1952	M — S	95½	4.27
Atchison, Top. & S. F. Gen. Adl. G. 4s. Stamped	1990	M — N	94½	4.23
Colorado & Southern 1st G. 4s.	1929	F — A	96	4.15
Baltimore & Ohio 1st G. 4s.	1948	A — O	99½	4.03
Chicago, Bur. & Quincy Gen. Mfg. 4s.	1958	M — S	99½	4.03
Minn., St. Paul & S. S. M. Con. 4s.	1938	J — J	99½	4.02
Missouri, Kansas & Texas 1st G. 4s.	1990	J — D	100½	3.99
Union Pacific Id. gr. G. 4s.	1947	J — J	102½	3.97
Nor. & Western Conv. 10-25-yr. 4s.	1932	J — D	102½	3.94
Atchison, Top. & S. F. Conv. G. 4s.	1955	J — D	119½	3.18
Atchison, Top. & S. F. Conv. 4s.	1955	J — D	121½	3.12
Union Pacific 30-yr. Conv. 4s.	1927	J — J	116½	3.94
Atchison, Top. & S. F. 10-yr. Conv. G. 5s.	1917	J — D	120½	2.23
Atchison, Top. & S. F. Conv. 5s.	1917	J — D	120½	2.15

Class A—Bonds of high grade, but affected somewhat by changing earning power as well as money rates and general conditions.

Kansas City, Ft. Scott & M. Ref. G. 4s.	1926	A — O	83	5.17
Atlantic Coast Line L. & N. 5-20-yr. Col. 4s.	1922	A — O	90½	4.97
Chicago & Alton 1st Lien 2½s	1950	J — J	75½	4.89
Missouri Pacific Col. Trust G. 5s.	1917	M — S	102	4.70
Chicago, R. I. & Pacific 1st Ref. G. 4s.	1934	A — O	90½	4.68
Erie 1st Con. G. Prior Lien 4s.	1906	F — A	87	4.61
Missouri, Kansas & Texas 2nd G. 4s.	1990	P — A	88	4.57
Louisville & Nashville South-Monon Joint 4s.	1952	J — J	90½	4.50
Baltimore & Ohio P. L. E. & W. Ref. 4s.	1941	M — N	93	4.41
P. L. E. & W. S. W. Div. (B. & O. System) 1st G. 2½s.	1941	M — N	93	4.41
Chesapeake & Ohio Gen. G. 4½s.	1992	M — S	104	4.33
Louisville & Nashville, Atl. Knor & Cin. Div. 4s.	1955	M — N	93½	4.32
Baltimore & Ohio, Southwestern Div. 2½s.	1925	J — J	90½	4.31
P. L. E. & W. S. W. Div. (B. & O. System) 1st G. 2½s.	1925	J — J	90½	4.31
St. Louis Southwestern 1st G. 4s.	1989	M — N	94	4.27
Baltimore & Ohio Prior 1st G. 3½	1925	J — J	92½	4.15

Class Baa—Good second grade bonds, somewhat speculative in nature.

Erie 1st. Con. Gen. Lien G. 4s.	1996	J — J	75½	5.20
Ann Arbor 1st G. 4s.	1995	Qu. — J	84	4.78
St. Louis, I. Mt. & So. R. & G. Div. 1st 4s.	1933	M — N	89	4.77
Missouri, Kansas & Texas 1st & Ref. 4s.	2004	M — S	95	4.68
Wisconsin Central, Sup. & Dul. Div. & Term. 1st 4s.	1936	M — N	93½	4.43
Wisconsin Central, 50-yr. 1st Gen. 4s.	1949	J — J	95	4.26
N. Y., N. H. & Hartford Con. Deb. 4s.	1945	J — J	143	3.84
N. Y., N. H. & Hartford Conv. 2½s. Deb.	1954	J — J	109	3.12

Class Ba—Well secured bonds, likely to decline if earnings fall off or advance if earnings increase.

Erie 50-yr. Conv. 4s., Series B	1953	A — O	73½	5.63
Wabash 1st Ref. & Ext. G. 4s.	1956	J — J	73½	5.62
Denver & Rio Grande, 1st & Ref. 5s.	1956	F — A	94½	5.24
Missouri, Kansas & Texas Gen. S. F. 4½s.	1936	J — J	90½	5.15
Erie 50-yr. Conv. 4s., Series A	1953	A — O	83	4.96
Southern Ry. 1st Con. G. 5s.	1994	J — J	110	4.84

Class B—Issues likely to fluctuate in price and more speculative than the fore-

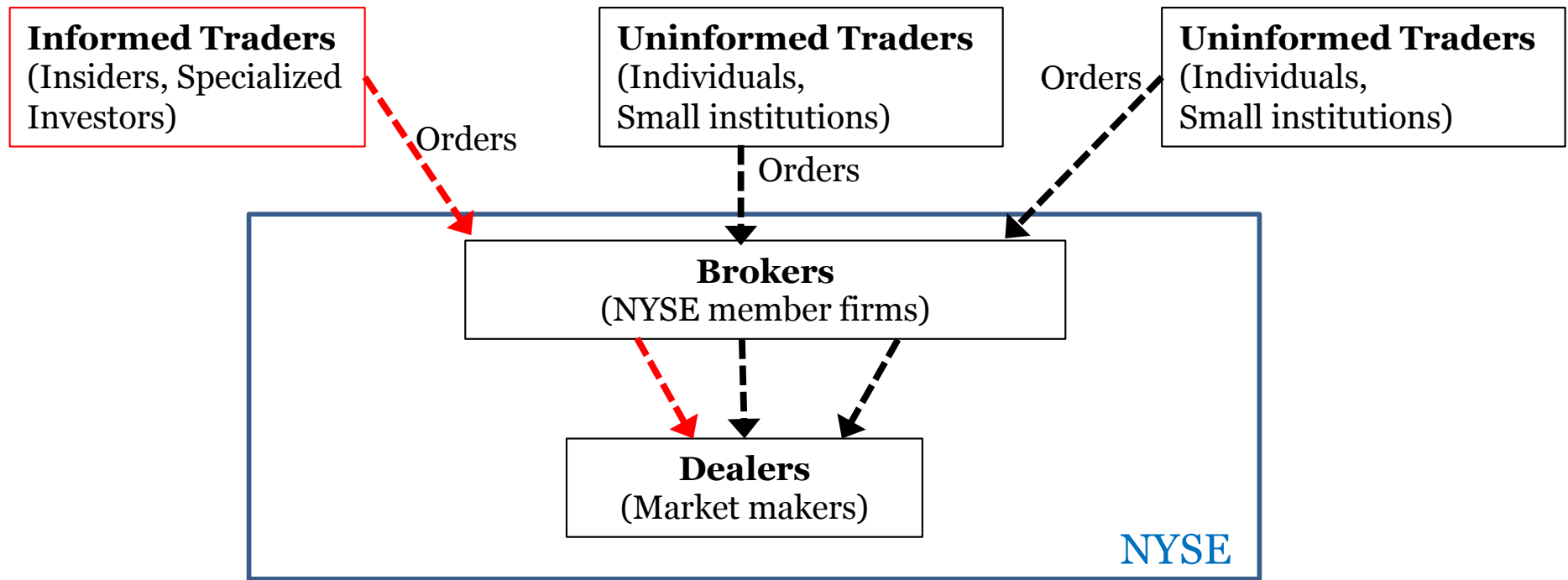
Effect of Surprises on Yields

Yield (Basis Points)	(1)	(2)	(3)	(4)	(5)	(6)
Neg Surprise \times Post	14.4*** (4.6)					
Neg Surprise \times Trend (Wks) \times Post		0.51*** (0.19)				
Neg Surprise \times Trend (Wks)		-0.08 (0.15)				
Neg Surprise \times Weeks Since			0.39*** (0.11)	0.41*** (0.11)	0.30** (0.15)	0.33** (0.13)
Implied 12-Month ATE	14bps	26bps	20bps	22bps	16bps	17bps
95% CI, bps	[5,23]	[7,46]	[9,32]	[7,36]	[1,31]	[4,31]
Bond FE	Y	Y	Y	Y	Y	Y
Rating FE \times Trend	Y	Y	Y	Y	Y	Y
Week FE	Y	Y	Y	Y	Y	Y
Firm \times Trend FE	-	-	-	-	Y	Y
Maturity \times Trend FE	-	-	-	-	-	Y
Level of Surprise	Firm	Firm	Firm	Bond	Bond	Bond
Post-Period Duration, Weeks	26-52	52	52	52	52	52
R^2	0.890	0.886	0.886	0.887	0.900	0.904
Obs	11,423	15,478	15,478	15,220	15,220	15,220

2) Did the Introduction of Ratings Affect the Functioning of Markets?

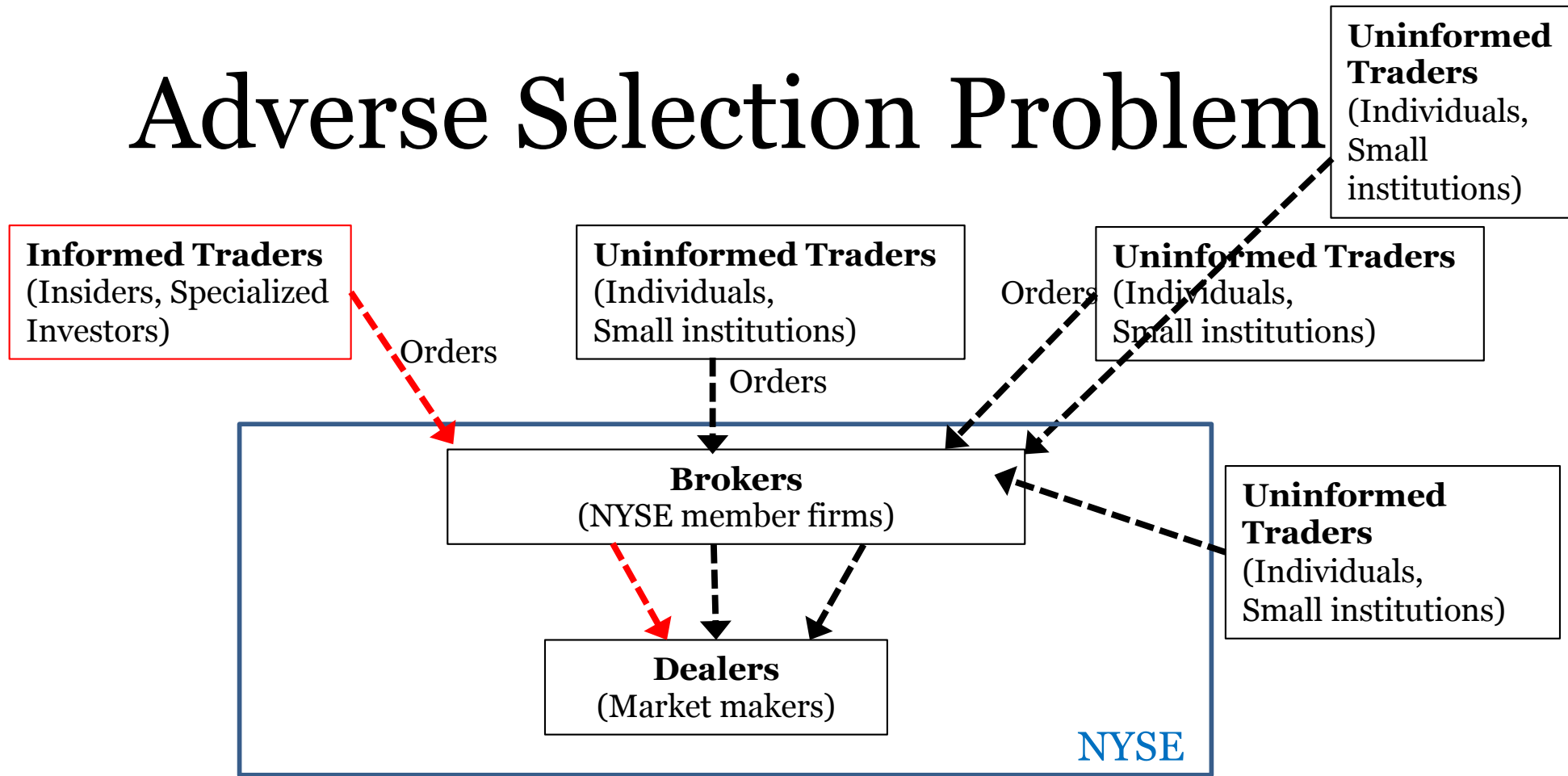
Independent evidence of effect of ratings – different data, different empirical design

Adverse Selection Problem



- Dealers post bid and ask quotes, transact with brokers
- Dealers at an *informational disadvantage* vis a vis informed traders, *informational advantage* vis a vis uninformed
- Most orders come from 'uninformed' traders – but dealers can not distinguish
- Dealers' knowledge of their informational disadvantage reflected in bid/ask spreads

Adverse Selection Problem



Better for the dealers!

Empirical Design - IV

Compare rated bonds to unrated railroad bonds, but unrated bonds very different.

Use Moody's ratings procedure:

1. Moody included **all RRs with low-yield bonds** (greatest investor interest); railroads with no low-yield bonds very unlikely to be included
2. For railroads in the manual, **rated all of their bonds.**
3. Many large railroads were created by combining smaller ones. Some rated railroads had obscure subsidiaries with bonds that got **rated purely because they were part of the capital stock** of a railroad that had other, low-yield bonds

Instrument “being rated” with **yields of the *other* bonds issued by same railroad:** \bar{y}_{-i}

Empirical design—IV

- Instrument “being rated” ($rated_i$) later in the period with **yields of the *other* bonds (\bar{y}_{-i}) issued by the same railroad later** in the period after controlling for that bond’s pre-rating yield

$$y_{it} = \alpha_i + \gamma_t + \theta_1 \widehat{rated_i} \times post_t + \theta_2 \widehat{rated_i} \times trend_t + \beta X_{it} + \epsilon_{it}$$

where X_{it} includes bonds pre-rating mean yield and spread x time trends

- Estimates produce LATE for bonds rated due to having been issued by RR with low-yield bond (typically have VERY high spreads)

Effects on Bid-Ask Spreads

	OLS (1)	2SLS (2)	2SLS (3)	2SLS (4)
Post × Rated Issue	-0.0054* (0.0031)	-0.0298*** (0.0099)	-0.0294*** (0.0099)	-0.0314*** (0.0109)
Trend × Rated Issue	0.00003 (0.00041)	0.0015 (0.0012)	0.0016 (0.0013)	0.00015 (0.0016)
Weak IV CI, Post × Rated	–	[-.056, -.012]	[-.053, -.014]	[-.048, -.014]
Bond FE	Y	Y	Y	Y
Week FE	Y	Y	Y	Y
Week FE × Pre-Rating Yield	Y	Y	Y	Y
Week FE × Pre-Rating Spread	Y	Y	Y	Y
Pre-period Illiquidity	-	-	≥ 60%	≥ 80%
Kleibergen-Paap F-Stat	-	17.5	20.7	47.0
Observations	5,085	5,085	2,076	1,042
Obs (Not rated)	6%	6%	11%	13%

Block Size

Trade-level data reported; collect one day per week for 24 weeks

“Small investors” – likely trades of 1 share (= \$1,000)

Do we see these increase?

TRANSACTIONS IN BONDS.	
NEW YORK STOCK EXCHANGE.	
Wednesday, April 29, 1908.	
Impri Jap Gov 4½s	Inter-Metro 4½s
steril loan	10,000..... 64
12,000..... 85½	Inter Merc Marine
500..... 85½	col trust 4½s
2,500..... 85½	30,000..... 69
10,000..... 85½	Inter Paper 6s
2d series	3,000..... 80¼
9,000..... 85½	Int Stm Pump 6s
1,500..... 85½	9,000..... 93
5,000..... 85½	Iowa Cent ref 4s
4s steril loan	3,000..... 75¾
10,000..... 77	2,000..... 76
22,000..... 76¾	2,000..... 75
U S of Mexico 3s	Kentucky Cent 4s
15,000..... 98½	1,000..... 90
4,000..... 98½	Kings Co Elev 4s,
N Y City 4½s, 1957	stamped gtd
10,000..... 108¼	17,000..... 81¼
11,000..... 108	Kings Co El L & P
1917	pur money 6s
1,000..... 103¾	5,000..... 106¼
N Y City 4½s, 1917,	Lackaw Steel 3s
temp recs	3,000..... 90
20,000..... 103½	L S & Mich So 3½s
N Y City 4½s, 1957,	1,000..... 95¼
temp recs	2,000..... 93
65,000..... 107½	L S & M So 4s
147,000..... 107	23,000..... 92
Adams Express 4s	1931
2,000..... 87½	3,000..... 92¾
Am Ice Secur 6s	15,000..... 12½
2,000..... 70	1,000..... 92¾
Am Hide & L 6s	Lo & N unified 4s
1,000..... 81	2,000..... 97
Am Tobacco 6s	2,000..... 97½
10,000..... 105½	2,000..... 97¾
6,000..... 105¾	Lo & N col tr 4s
2,000..... 105½	9,000..... 91½
4,000..... 105¾	Mex Cent con 4s
8,000..... 103¾	5,000..... 80½
4,000..... 105	1,000..... 80
Am Tobacco 4s	1,000..... 80¼
5,000..... 71¾	10,000..... 80½
8,000..... 71¾	6,000..... 80¼
	4,000..... 80¾

Effects on Block Size

	2SLS (1) Any Trans	2SLS (2) # 1 Lot Trades	2SLS (3) $1_{1LotTrade}$	2SLS (4) # ≥ 10 Lot Trades
Post 23rd April 1909 \times Rated Issue	-0.0083 (0.1153)	0.568** (0.274)	0.391** (0.194)	0.132 (0.743)
Trend \times Rated Issue	0.0031 (0.0085)	-0.035 (0.025)	-0.024 (0.017)	0.010 (0.091)
Weak IV Robust Confidence Set, Post \times Rated	–	[0.120, 1.238]	[0.081, 0.859]	–
Bond FE	Y	Y	Y	Y
Week FE	Y	Y	Y	Y
Week FE \times Pre-Rating Yield	Y	Y	Y	Y
Week FE \times Pre-Rating Spread	Y	Y	Y	Y
Kleibergen-Paap F-Stat	18.7	11.6	11.6	11.6
Dep Var Mean	0.259	0.403	0.333	0.741
Observations	9,675	2,429	2,429	2,429

Interpretation

The first securities ratings mattered.

Why?

- May convey something new, even if largely based on publicly-available data
 - Persistence of effects, later use in regulation suggests that may be the case

How?

- Facilitated growing need for “some sort of scheme to classify railroad securities” from experience with users of early manuals, “who were constantly asking for opinions on values.”
- Form, not just level, of ratings scheme may have helped transmit information

Moody 1909: “It is a work *simplifying* an apparently *complicated* subject, and it is based on thoroughly sound principles applied to incontestable facts.”

Simplification of complex information into easy-to-understand grades. Echoes theoretical literature arguing that simple signals may help transmit information in complex environments because they are easier to interpret (Crawford and Sobel, 1982; Martel et al., 2019)

Conclusion

- Ratings enabled investors to process information more accurately, and reduced asymmetric information between investors – moving prices and improving liquidity
- Important innovation that helped support development of U.S. financial markets and broadening of market access
- Suggests ratings may facilitate information transmission even in setting with high monetary stakes and well-incentivized market participants, where a lot of information is already available
 - Coarse ratings frequently used in many economic settings, such as Michelin Stars, health inspection scores, yelp reviews, student grades, tenure decisions, w/ plausibly even bigger effects....
 - Especially if regulation has led to reliance on ratings and effectively reduced information creation outside of rating agencies