50 Years of Altman Z-Score: what have we learned and the applications in financial and managerial markets

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#LSEAltman

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LSE Credit Seminar
London School of Economics
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NYU STERN

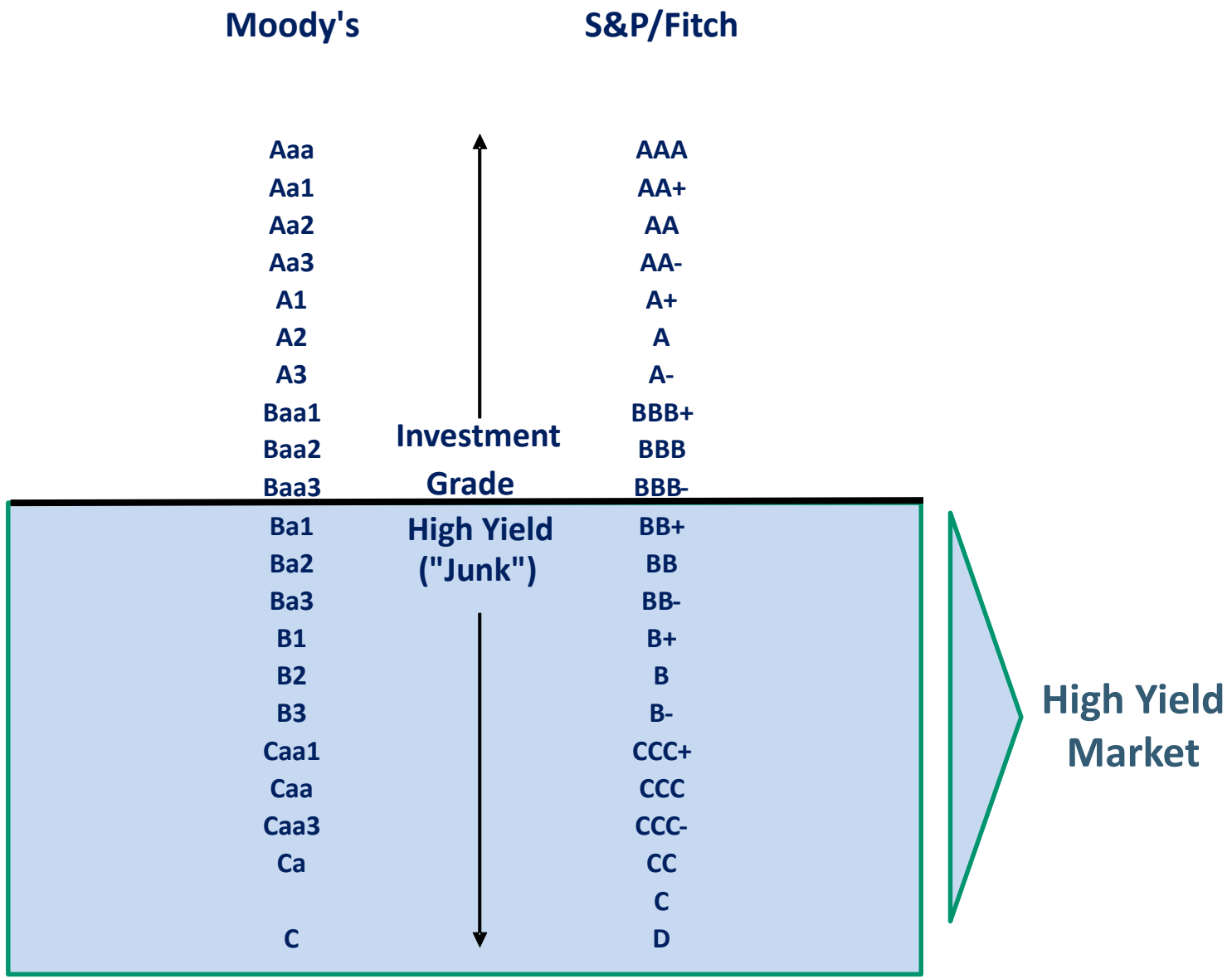
Scoring Systems

- Qualitative (Subjective) – 1800s
- Univariate (Accounting/Market Measures)
  - Rating Agency (e.g. *Moody's* (1909), *S&P Global Ratings* (1916) and Corporate (e.g., *DuPont*) Systems (early 1900s)
- Multivariate (Accounting/Market Measures) – 1968 (Z-Score) $\rightarrow$ Present
  - Discriminant, Logit, Probit Models (Linear, Quadratic)
  - Non-Linear and "Black-Box" Models (e.g., Recursive Partitioning, Neural Networks, 1990s), Machine Learning , Hybrid
- Discriminant and Logit Models in Use for
  - Consumer Models - *Fair Isaacs* (FICO Scores)
  - Manufacturing Firms (1968) – Z-Scores
  - Extensions and Innovations for Specific Industries and Countries (1970s – Present)
  - ZETA Score – Industrials (1977)
  - Private Firm Models (e.g., Z'-Score (1983), Z"-Score (1995))
  - EM Score – Emerging Markets (1995)
  - Bank Specialized Systems (1990s)
  - SMEs (e.g. Edmister (1972), Altman & Sabato (2007) & *Wiserfunding* (2016))
- Option/Contingent Claims Models (1970s – Present)
  - Risk of Ruin (Wilcox, 1973)
  - *KMVs* Credit Monitor Model (1993) – Extensions of Merton (1974) Structural Framework

Scoring Systems
(continued)

- Artificial Intelligence Systems (1990s – Present)
  - Expert Systems
  - Neural Networks
  - Machine Learning
- Blended Ratio/Market Value/Macro/Governance/Invoice Data Models
  - Altman Z-Score (*Fundamental Ratios and Market Values)* – 1968
  - Bond Score (*Credit Sights*, 2000; RiskCalc *Moody's*, 2000)
  - Hazard (Shumway), 2001)
  - *Kamakura's* Reduced Form, Term Structure Model (2002)
  - Z-Metrics (Altman, et al, *Risk Metrics*©, 2010)
- Re-introduction of Qualitative Factors/FinTech
  - Stand-alone Metrics, e.g., Invoices, Payment History
  - Multiple Factors – Data Mining (Big Data Payments, Governance, time spent on individual firm reports [e.g., *CreditRiskMonitor's* revised FRISK Scores, 2017], etc.)

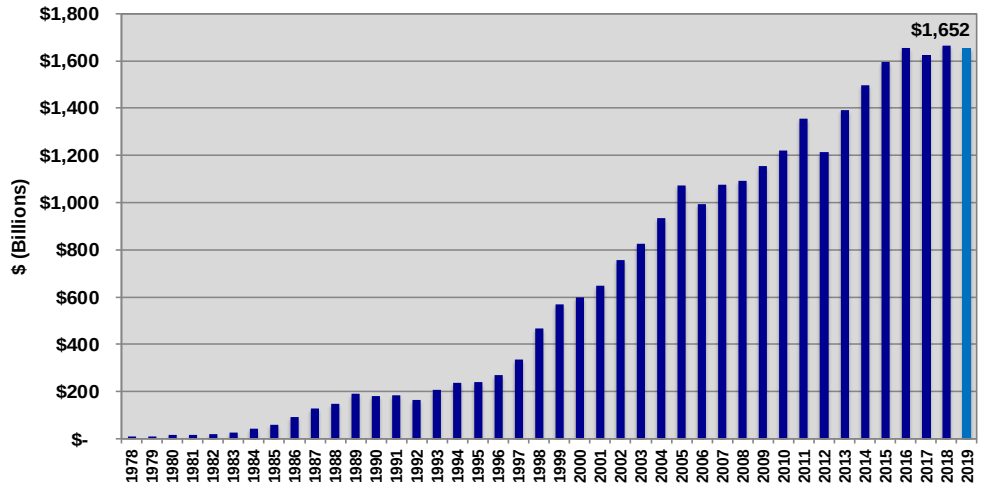
Major Agencies Bond Rating Categories



Size Of High-Yield Bond Market

US Market

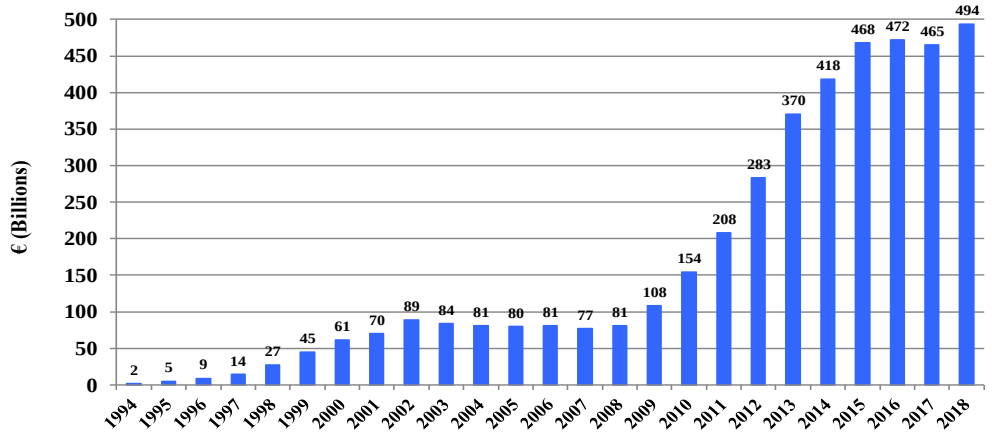
1978 – 2019 *(Mid-year US$ billions)*



Source: NYU Salomon Center estimates using BoAML, Credit Suisse, S&P and Citi data

Western Europe Market

1994 – 2018*



Source: Credit Suisse

*Includes non-investment grade straight corporate debt of issuers with assets located in or revenues derived from Western Europe, or the bond is denominated in a Western European currency. Floating-rate and convertible bonds and preferred stock are not included.

Key Industrial Financial Ratios
(U.S. Industrial Long-term Debt)

Medians of Three- Year (2009-2011) Averages	AAA	AA	A	BBB	BB	B	CCC*
EBITDA margin (%)	27.9	27.6	20.4	19.7	17.6	16.6	
Return on Capital (%)	30.6	23.6	20.7	13.2	10.9	7.8	2.7
EBIT Interest Coverage(x)	33.4	14.2	11.6	5.9	3.0	1.3	0.4
EBITDA Interest Coverage (x)	38.1	19.6	15.3	8.2	4.8	2.3	1.1
Funds from Operations/Total Debt (%)	252.6	64.7	52.6	33.7	24.9	11.7	2.5
Free Operating Cash Flow/Total Debt (%)	208.2	51.3	35.7	19.0	11.1	3.9	(3.6)
Disc. Cash Flow/Debt (%)	142.8	32.0	26.1	13.9	8.8	3.1	
Total Debt/EBITDA (x)	0.4	1.2	1.5	2.3	3.2	5.5	8.6
Total Debt/Total Debt + Equity (%)	14.7	29.2	33.8	43.5	52.2	75.2	98.9
No. of Companies	4	14	93	227	260	287	

* 2005-2007

Source: Standard & Poor's, CreditStats: 2011 Industrial Comparative Ratio Analysis, Long-Term Debt – US (RatingsDirect, August 2012).

Key Industrial Financial Ratios
(Europe, Middle East & Africa Industrial Long-term Debt)

Medians of Three- Year (2008-2010) Averages	AA	A	BBB	BB	B
EBITDA margin (%)	24.9	16.6	15.5	17.6	16.3
Return on Capital (%)	20.0	15.3	11.2	9.3	6.7
EBIT Interest Coverage(x)	15.7	7.0	3.9	3.1	1.0
EBITDA Interest Coverage (x)	18.5	9.5	5.7	4.6	2.0
Funds from Operations/Total Debt (%)	83.4	45.7	32.3	22.7	10.5
Free Operating Cash Flow/Total Debt (%)	57.8	23.2	16.0	7.1	1.3
Disc. Cash Flow/Debt (%)	30.5	12.5	8.0	3.4	0.8
Total Debt/EBITDA (x)	0.9	1.6	2.6	3.2	5.8
Total Debt/Total Debt + Equity (%)	25.7	33.8	44.4	51.9	75.8
No. of Companies	8	55	104	58	55

Source: Standard & Poor's, CreditStats: 2010 Adjusted Key US & European Industrial and Utility Financial Ratios (RatingsDirect, August 2011).

Z-Score Component Definitions and Weightings

Variable	Definition	Weighting Factor
X_1	$\frac{\text{Working Capital}}{\text{Total Assets}}$	1.2
X_2	$\frac{\text{Retained Earnings}}{\text{Total Assets}}$	1.4
X_3	$\frac{\text{EBIT}}{\text{Total Assets}}$	3.3
X_4	$\frac{\text{Market Value of Equity}}{\text{Book Value of Total Liabilities}}$	0.6
X_5	$\frac{\text{Sales}}{\text{Total Assets}}$	1.0

Zones of Discrimination: Original Z - Score Model (1968)

Z > 2.99 - "Safe" Zone
1.8 < Z < 2.99 - "Grey" Zone
Z < 1.80 - "Distress" Zone

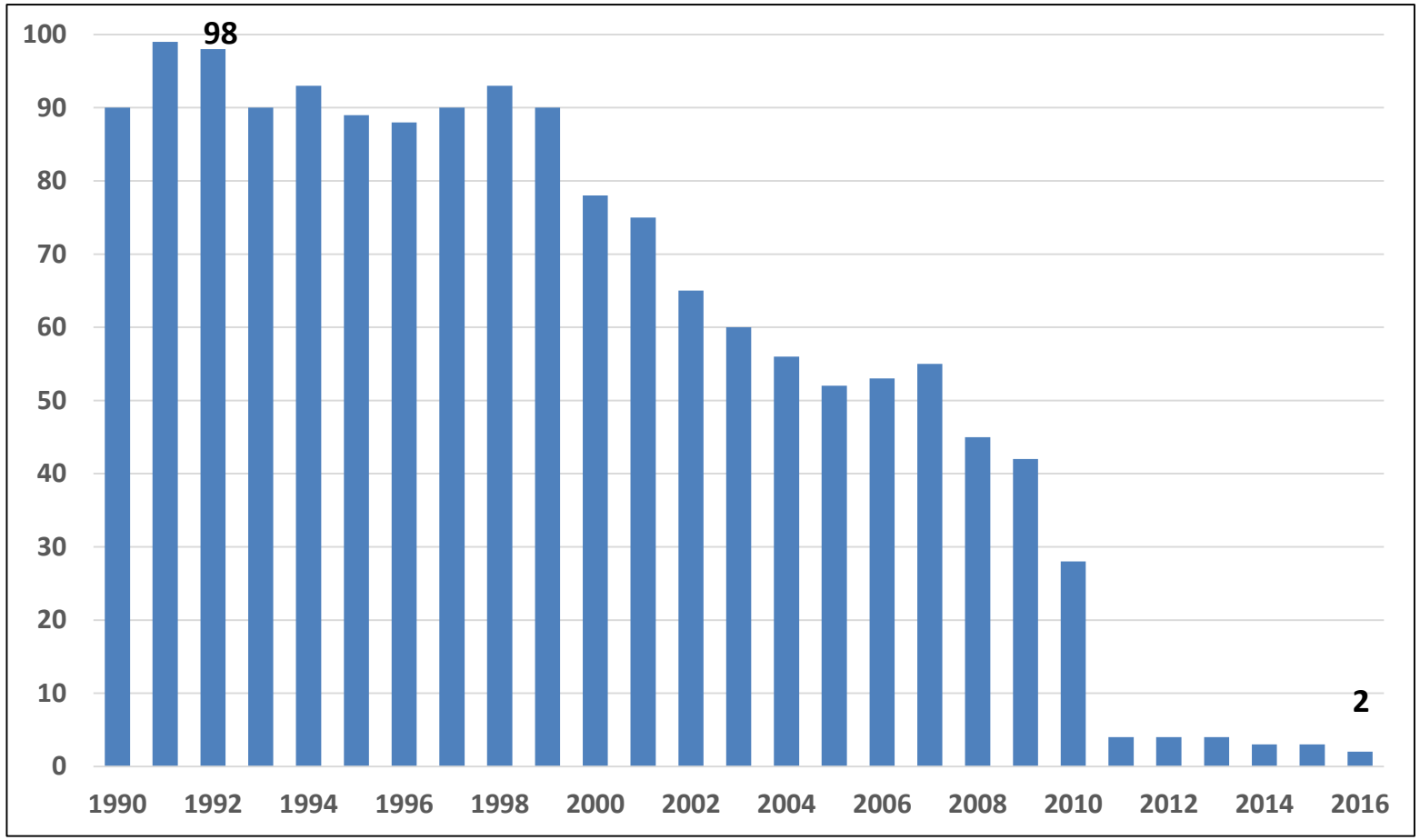
Time Series Impact On Corporate Z-Scores

- Credit Risk Migration
  - Greater Use of Leverage
  - Impact of HY Bond & LL Markets
  - Global Competition
  - More and Larger Bankruptcies
  - Near Extinction of U.S. AAA Firms

- Increased Type II Error

The Near Extinction of the U.S. AAA Rated Company

Number of AAA Rated Groups in the U.S.



Sources: Standard & Poor's, Estimated from Platt, E., "Triple A Quality Fades as Companies Embrace Debt", *Financial Times*, May 24, 2016.

Estimating Probability of Default (PD) and Probability of Loss Given Defaults (LGD)

Method #1

- Credit scores on new or existing debt
- Bond rating equivalents on new issues (Mortality) or existing issues (Rating Agency Cumulative Defaults)
- Utilizing mortality or cumulative default rates to estimate marginal and cumulative defaults
- Estimating Default Recoveries and Probability of Loss

or

Method #2

- Credit scores on new or existing debt
- Direct estimation of the probability of default
- Based on PDs, assign a rating

Median Z-Score by S&P Bond Rating for U.S. Manufacturing Firms: 1992 - 2017

Rating	2017 (No.)	2013 (No.)	2004-2010	1996-2001	1992-1995
AAA/AA	4.20 (14)	4.13 (15)	4.18	6.20*	4.80*
A	3.85 (55)	4.00 (64)	3.71	4.22	3.87
BBB	3.10 (137)	3.01 (131)	3.26	3.74	2.75
BB	2.45 (173)	2.69 (119)	2.48	2.81	2.25
B	1.65 (94)	1.66 (80)	1.74	1.80	1.87
CCC/CC	0.73 (4)	0.23 (3)	0.46	0.33	0.40
D	-0.10 (6)[1]	0.01 (33)[2]	-0.04	-0.20	0.05

*AAA Only.
[1] From 1/2014-11/2017, [2]From 1/2011-12/2013.

Sources: S&P Global Market Intelligence's *Compustat* Database, mainly S&P 500 firms, compilation by NYU Salomon Center, Stern School of Business.

Marginal and Cumulative Mortality Rate Actuarial Approach

$$\mathbf{MMR_{(r,t)}} \quad \frac{\textit{total value of defaulting debt from rating (r) in year (t)}}{\textit{total value of the population at the start of the year (t)}}$$

$\overline{M}$MR = Marginal Mortality Rate

One can measure the cumulative mortality rate (CMR) over a specific time period (1,2,…, T years) by subtracting the product of the surviving populations of each of the previous years from one (1.0), that is,

$$\boldsymbol{CMR}_{(r,t)} = 1 - \Pi\, SR_{(r,t)}\,,$$
$$t = 1 \rightarrow N$$
$$r = AAA \rightarrow CCC$$

here CMR $_{(r,t)}$ = Cumulative Mortality Rate of (r) in $_{(t)}$,

SR $_{(r,t)}$ = Survival Rate in $_{(r,t)}$, 1 - MMR $_{(r,t)}$

Mortality Rates by Original Rating

All Rated Corporate Bonds*
1971-2018

Years After Issuance

		1	2	3	4	5	6	7	8	9	10
AAA	Marginal	0.00%	0.00%	0.00%	0.00%	0.01%	0.02%	0.01%	0.00%	0.00%	0.00%
	Cumulative	0.00%	0.00%	0.00%	0.00%	0.01%	0.03%	0.04%	0.04%	0.04%	0.04%
AA	Marginal	0.00%	0.00%	0.18%	0.05%	0.02%	0.01%	0.03%	0.04%	0.03%	0.04%
	Cumulative	0.00%	0.00%	0.18%	0.23%	0.25%	0.26%	0.29%	0.33%	0.36%	0.40%
A	Marginal	0.01%	0.02%	0.09%	0.10%	0.07%	0.04%	0.02%	0.22%	0.05%	0.03%
	Cumulative	0.01%	0.03%	0.12%	0.22%	0.29%	0.33%	0.35%	0.57%	0.62%	0.65%
BBB	Marginal	0.29%	2.26%	1.20%	0.95%	0.46%	0.20%	0.21%	0.15%	0.15%	0.31%
	Cumulative	0.29%	2.54%	3.71%	4.63%	5.07%	5.26%	5.46%	5.60%	5.74%	6.03%
BB	Marginal	0.89%	2.01%	3.79%	1.95%	2.38%	1.52%	1.41%	1.07%	1.38%	3.07%
	Cumulative	0.89%	2.88%	6.56%	8.38%	10.57%	11.92%	13.17%	14.10%	15.28%	17.88%
B	Marginal	2.84%	7.62%	7.71%	7.73%	5.71%	4.44%	3.58%	2.03%	1.70%	0.71%
	Cumulative	2.84%	10.24%	17.16%	23.57%	27.93%	31.13%	33.60%	34.94%	36.05%	36.50%
CCC	Marginal	8.05%	12.36%	17.66%	16.21%	4.87%	11.58%	5.38%	4.76%	0.61%	4.21%
	Cumulative	8.05%	19.42%	33.65%	44.40%	47.11%	53.23%	55.75%	57.86%	58.11%	59.88%

*Rated by S&P at Issuance
Based on 3,454 issues

Source: S&P Global Ratings and Author's Compilation

Mortality Losses by Original Rating

All Rated Corporate Bonds*
1971-2018

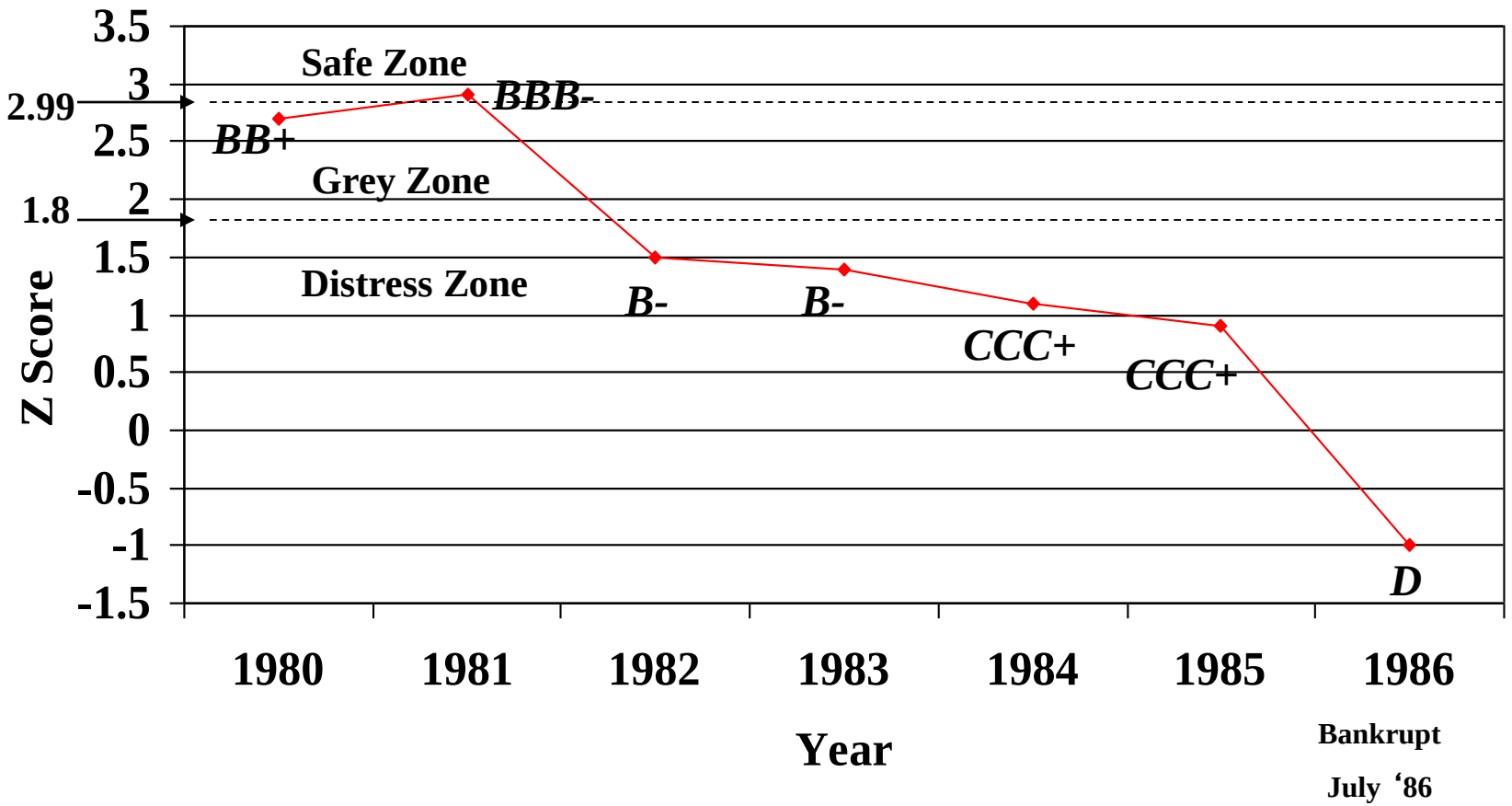
Years After Issuance

		1	2	3	4	5	6	7	8	9	10
AAA	Marginal	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%	0.01%	0.00%	0.00%	0.00%
	Cumulative	0.00%	0.00%	0.00%	0.00%	0.01%	0.02%	0.03%	0.03%	0.03%	0.03%
AA	Marginal	0.00%	0.00%	0.01%	0.02%	0.01%	0.01%	0.00%	0.01%	0.01%	0.01%
	Cumulative	0.00%	0.00%	0.01%	0.03%	0.04%	0.05%	0.05%	0.06%	0.07%	0.08%
A	Marginal	0.00%	0.01%	0.03%	0.03%	0.04%	0.04%	0.02%	0.01%	0.04%	0.02%
	Cumulative	0.00%	0.01%	0.04%	0.07%	0.11%	0.15%	0.17%	0.18%	0.22%	0.24%
BBB	Marginal	0.20%	1.47%	0.68%	0.56%	0.24%	0.14%	0.07%	0.08%	0.08%	0.16%
	Cumulative	0.20%	1.67%	2.34%	2.88%	3.12%	3.25%	3.32%	3.40%	3.47%	3.63%
BB	Marginal	0.53%	1.14%	2.26%	1.09%	1.35%	0.74%	0.79%	0.49%	0.70%	1.05%
	Cumulative	0.53%	1.66%	3.89%	4.93%	6.22%	6.91%	7.65%	8.10%	8.74%	9.70%
B	Marginal	1.88%	5.33%	5.30%	5.18%	3.76%	2.41%	2.33%	1.12%	0.88%	0.50%
	Cumulative	1.88%	7.11%	12.03%	16.59%	19.73%	21.66%	23.49%	24.34%	25.01%	25.38%
CCC	Marginal	5.33%	8.65%	12.45%	11.43%	3.39%	8.58%	2.28%	3.30%	0.37%	2.66%
	Cumulative	5.33%	13.52%	24.29%	32.94%	35.21%	40.77%	42.12%	44.03%	44.24%	45.72%

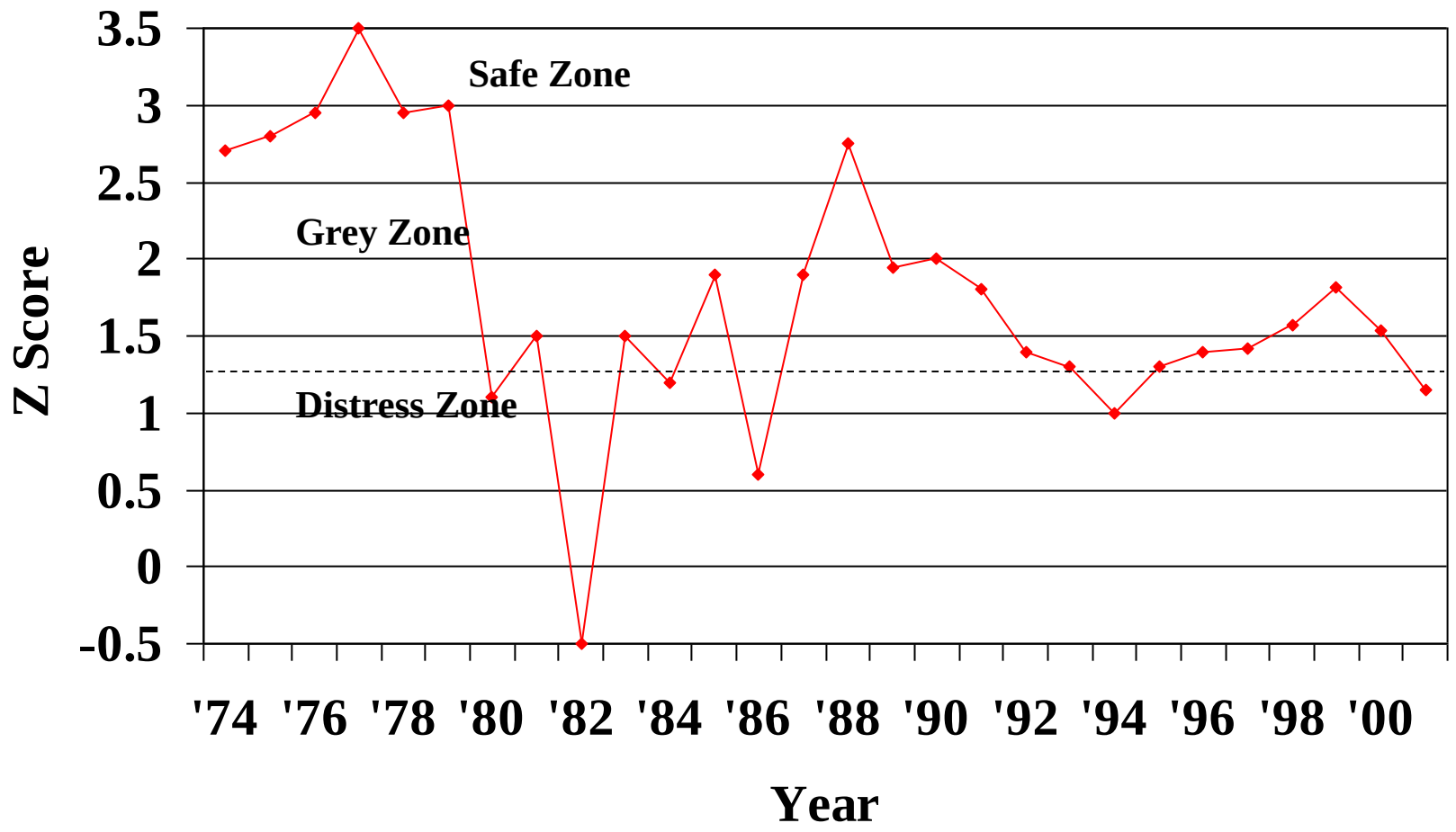
*Rated by S&P at Issuance
Based on 2,894 issues

Source: S&P Global Ratings and Author's Compilation

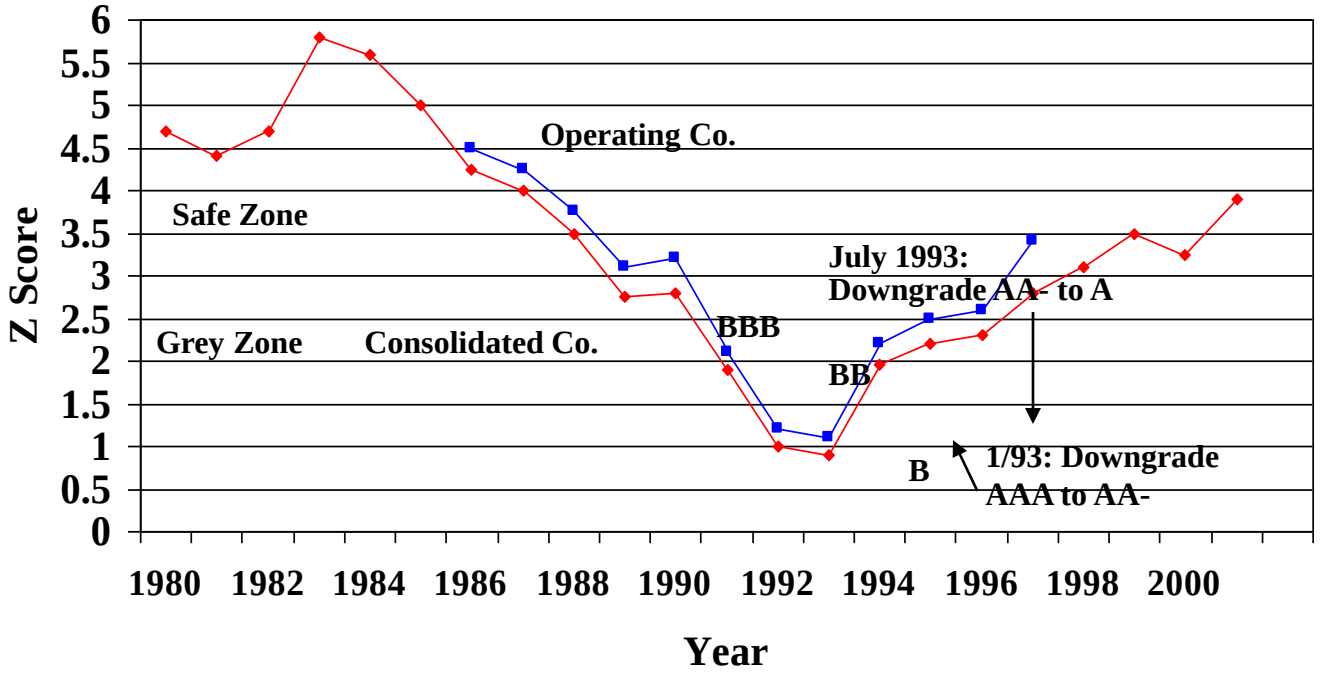
Z Score Trend - LTV Corp.



International Harvester (Navistar)
Z Score (1974 – 2001)



IBM Corporation
Z Score (1980 – 2001, update 2015-2017)



Recent Z-Scores & BREs			
Year -End	Z-Score	BRE	Actual S&P Rating
2015	3.63	A-	
2016	3.58	A-	
2017	3.27	BBB+	A+

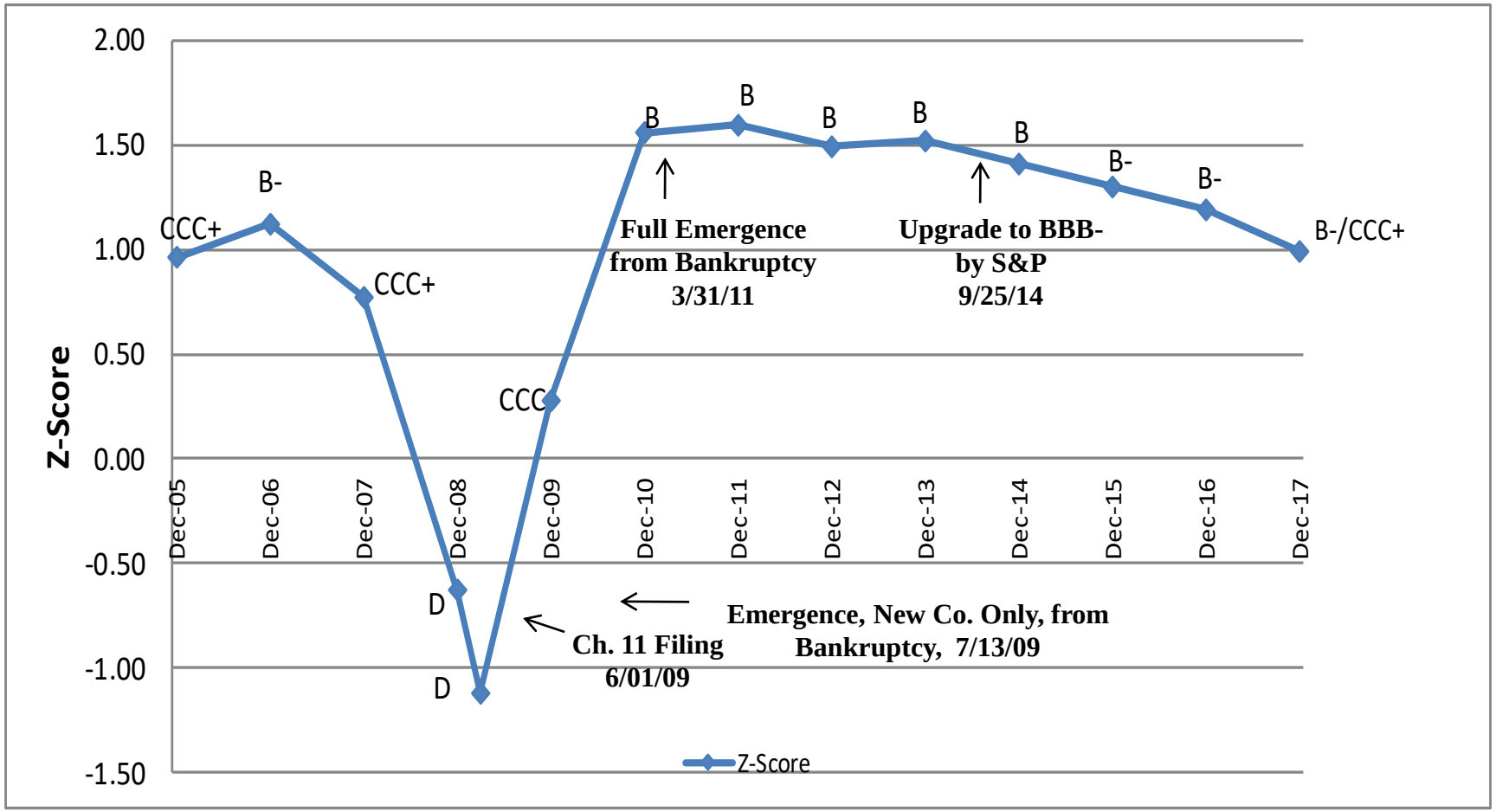
Z-Score Model Applied to General Motors (Consolidated Data): Bond Rating Equivalents and Scores from 2005 – 2017

	Z-Scores	BRE
12/31/17	0.99	B-/CCC+
12/31/16	1.19	B-
12/31/15	1.30	B-
12/31/14	1.41	B
12/31/13	1.52	B
12/31/12	1.49	B
12/31/11	1.59	B
12/31/10	1.56	B
12/31/09	0.28	CCC
03/31/09	(1.12)	D
12/31/08	(0.63)	D
12/31/07	0.77	CCC+
12/31/06	1.12	B-
12/31/05	0.96	CCC+

Note: Consolidated Annual Results. Data Source: S&P Global Market Intelligence's S&P Capital IQ platform, Bloomberg., Edgar

Z-Score Model Applied to GM (Consolidated Data): Bond Rating Equivalents and Scores from 2005 – 2017

Z- Score: General Motors Co.



Additional Altman Z-Score Models:

Private Firm Model (1968)

Non-U.S., Emerging Markets Models for Non Financial Industrial Firms (1995)

e.g. Latin America (1977, 1995), China (2010), etc.

Sovereign Risk Bottom-Up Model (2011)

SME Models for the U.S. (2007) & Europe

e.g. Italian Minibonds (2016), U.K. (2017), Spain (2018)

An Example of A European SME Model

The Italian SME & Mini-Bond Markets

Our Work with the U.S. H.Y. Bond Market and SMEs Globally (WiserFunding Ltd.)

Italy - Classis Capital, Italian Borsa, Wiserfunding and Minibond Advising, Issuance and Trading

Providing a Credit Market Discipline (Credit Culture) to the Italian Mini-bond Market and SMEs Globally

Z" Score Model for Manufacturers, Non-Manufacturer Industrials; Developed and Emerging Market Credits (1995)

$$Z'' = 3.25 + 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$$

$$X_1 = \frac{\text{Current Assets - Current Liabilities}}{\text{Total Assets}}$$

$$X_2 = \frac{\text{Retained Earnings}}{\text{Total Assets}}$$

$$X_3 = \frac{\text{Earnings Before Interest and Taxes}}{\text{Total Assets}}$$

$$X_4 = \frac{\text{Book Value of Equity}}{\text{Total Liabilities}}$$

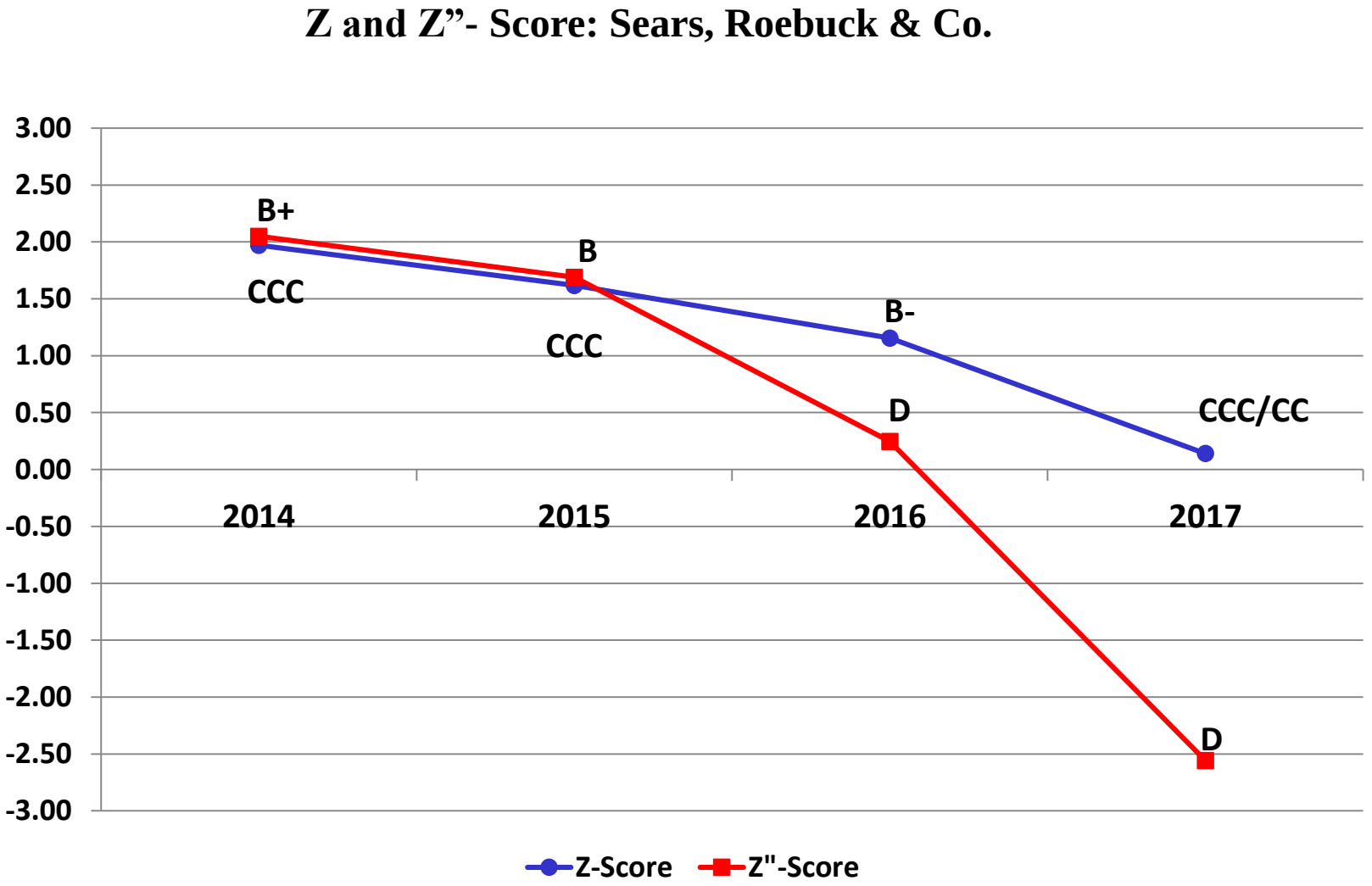
US Bond Rating Equivalents Based on Z”-Score Model

$$Z'' = 3.25 + 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$$

Rating	Median 1996 Z”-Score[a]	Median 2006 Z”-Score[a]	Median 2013 Z”-Score[a]
AAA/AA+	8.15 (8)	7.51 (14)	8.80 (15)
AA/AA-	7.16 (33)	7.78 (20)	8.40 (17)
A+	6.85 (24)	7.76 (26)	8.22 (23)
A	6.65 (42)	7.53 (61)	6.94 (48)
A-	6.40 (38)	7.10 (65)	6.12 (52)
BBB+	6.25 (38)	6.47 (74)	5.80 (70)
BBB	5.85 (59)	6.41 (99)	5.75 (127)
BBB-	5.65 (52)	6.36 (76)	5.70 (96)
BB+	5.25 (34)	6.25 (68)	5.65 (71)
BB	4.95 (25)	6.17 (114)	5.52 (100)
BB-	4.75 (65)	5.65 (173)	5.07 (121)
B+	4.50 (78)	5.05 (164)	4.81 (93)
B	4.15 (115)	4.29 (139)	4.03 (100)
B-	3.75 (95)	3.68 (62)	3.74 (37)
CCC+	3.20 (23)	2.98 (16)	2.84 (13)
CCC	2.50 (10)	2.20 (8)	2.57(3)
CCC-	1.75 (6)	1.62 (-)[b]	1.72 (-)[b]
CC/D	0 (14)	0.84 (120)	0.05 (94)[c]

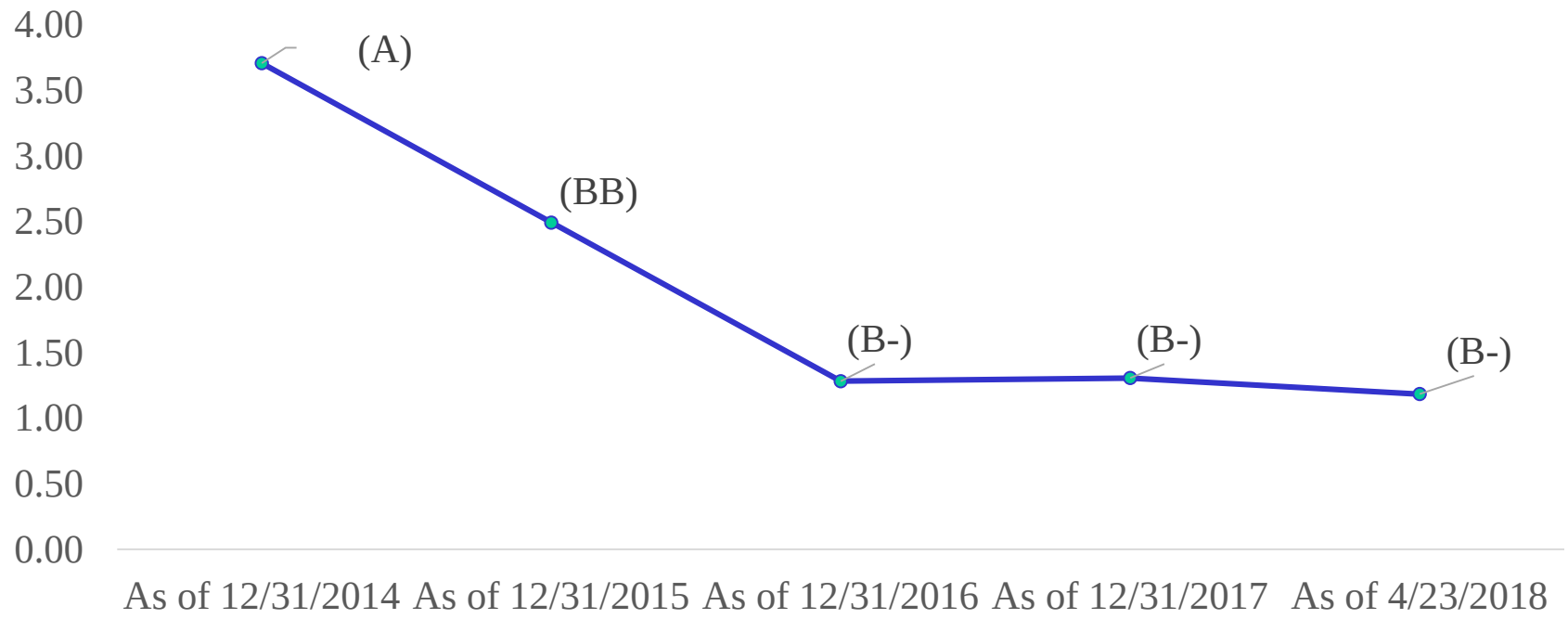
[a]Sample Size in Parantheses. [b]Interpolated between CCC and CC/D. [c]Based on 94 Chapter 11 bankruptcy filings, 2010-2013.
Sources: Compustat, Company Filings and S&P.

Z and Z”-Score Models Applied to Sears, Roebuck & Co.: Bond Rating Equivalents and Scores from 2014 – 2017



Source: E. Altman, NYU Salomon Center

Tesla Z Scores and BREs (2014 – April 2018)



Source: E. Altman, NYU Salomon Center

Financial Distress (Z-Score) Prediction Applications

External (To The Firm) Analytics	Internal (To The Firm) & Research Analytics
• **Lenders (e.g., Pricing, Basel Capital Allocation)** • Bond Investors (e.g., Quality Junk Portfolio • Long/Short Investment Strategy on Stocks (e.g. Baskets of Strong Balance Sheet Companies & Indexes, e.g. STOXX, Goldman, Nomura) • Security Analysts & Rating Agencies • Regulators & Government Agencies • Auditors (Audit Risk Model) – Going Concern • Advisors (e.g., Assessing Client's Health) • M&A (e.g., Bottom Fishing)	• **To File or Not (e.g., General Motors)** • **Comparative Risk Profiles Over Time** • Industrial Sector Assessment (e.g., Energy) • Sovereign Default Risk Assessment • **Procurement Officer, Suppliers Assessment** • Accounts Receivables Management • Researchers – Scholarly Studies • Chapter 22 Assessment • **Managers – Managing a Financial Turnaround**

Comparative Health of High-Yield Firms (2007 vs. 2017)

Comparing Financial Strength of High-Yield Bond Issuers in 2007& 2012/2014/2017

Number of Firms		
	Z-Score	Z”-Score
2007	294	378
2012	396	486
2014	577	741
2017	529	583

Year	Average Z-Score/ (BRE)*	Median Z-Score/ (BRE)*	Average Z”-Score/ (BRE)*	Median Z”-Score/ (BRE)*
2007	1.95 (B+)	1.84 (B+)	4.68 (B+)	4.82 (B+)
2012	1.76 (B)	1.73 (B)	4.54 (B)	4.63 (B)
2014	2.03 (B+)	1.85 (B+)	4.66 (B+)	4.74 (B+)
2017	2.08 (B+)	1.98 (B+)	5.08 (BB-)	5.09 (BB-)

*Bond Rating Equivalent

Source: Authors’ calculations, data from Altman and Hotchkiss (2006) and S&P Global Market Intelligence’s S&P *Capital IQ platform/Compustat database.*

AN EMERGING MARKET CORPORATE MODEL: A MODIFIED Z”-SCORE MODEL

MANAGING A FINANCIAL TURNAROUND: THE GTI CASE

CAVEATS FOR A SUCCESSFUL TURNAROUND

The Development of Alternative Financing Sources for SMEs & the Assessment of SME Credit Risk

Dr. Edward Altman
NYU Stern School of Business

NYU STERN

wiserfunding

START

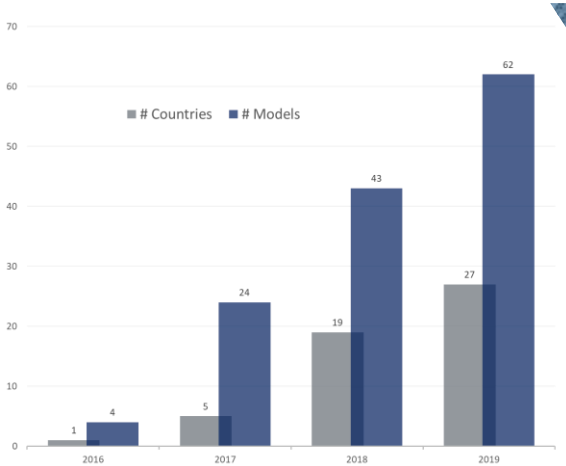
We incorporated in April 2016 in UK and in July 2016 in Italy and became partner of the Italian stock exchange in August.

2016

FIXED INCOME PARTNER
BORSA ITALIANA

MODELS

We have developed models for all countries in Europe each segmented by industry sectors

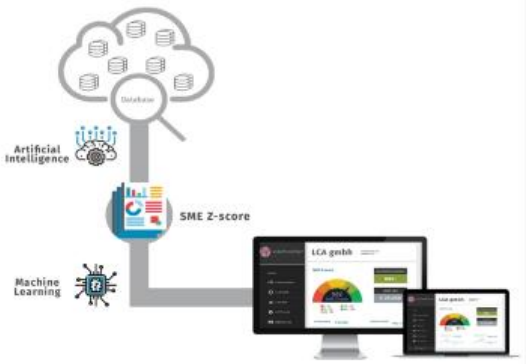


2017

TECHNOLOGY

Together with our partner CERTUA Ltd, we have designed and developed our platform to implement our models

2018



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OUR VISION

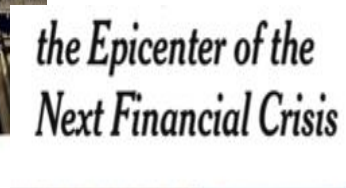
BECOME THE MARKET STANDARD TO ASSESS THE CREDIT RISK OF SMEs

We are now ready to bring our innovations to U.S. and Asia to facilitate SME lending by providing the most advanced and predictive tools to assess their credit risk

WHY IS A CREDIBLE AND SOUND RISK MODEL FOR SMEs INCREASINGLY RELEVANT?

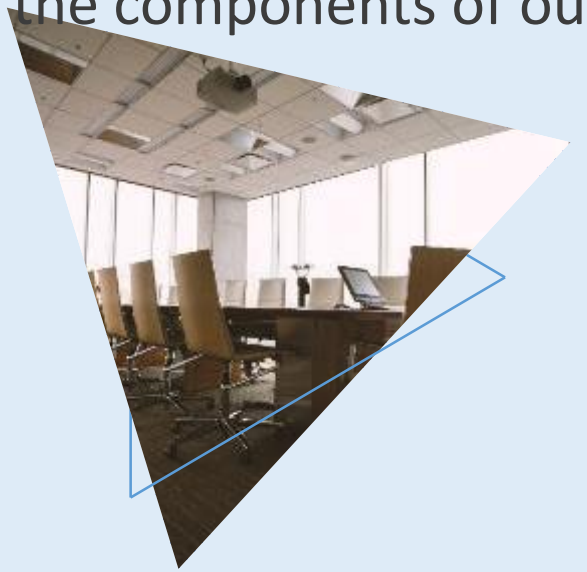
Bank of England

Bank of England raises



Several signs seem to suggest that the longest benign cycle in the history may be coming to an end soon. What impact would that have on the outstanding debt towards SME?

What are the components of our models?



Step 1

Financial variables

We use 8 to 14 financial ratios specific to SMEs covering leverage, liquidity, profitability and coverage

Step 2

Corporate governance

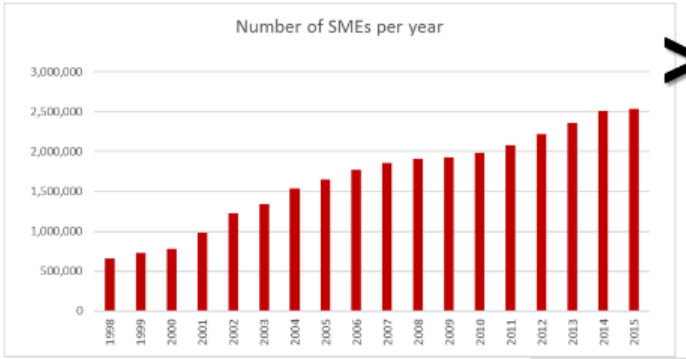
We collect a vast amount of structured and unstructured data on directors and the company sourcing from several databases

Step 3

Macroeconomic variables

To ensure the stability of the model across time, we use industry specific macroeconomic data to help predicting the market outlook

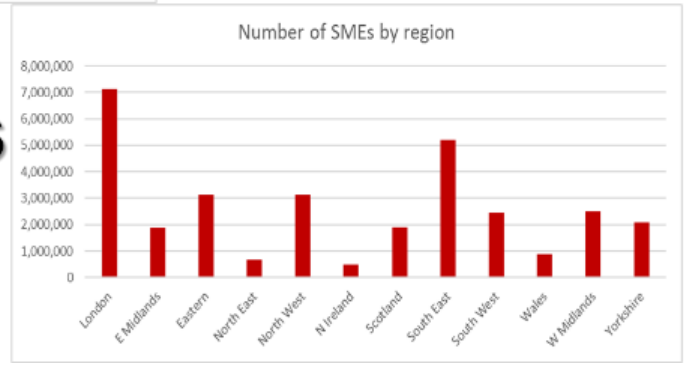
The UK SME Z-Score models



>30m of SMEs

1998- 2016

12 Regions



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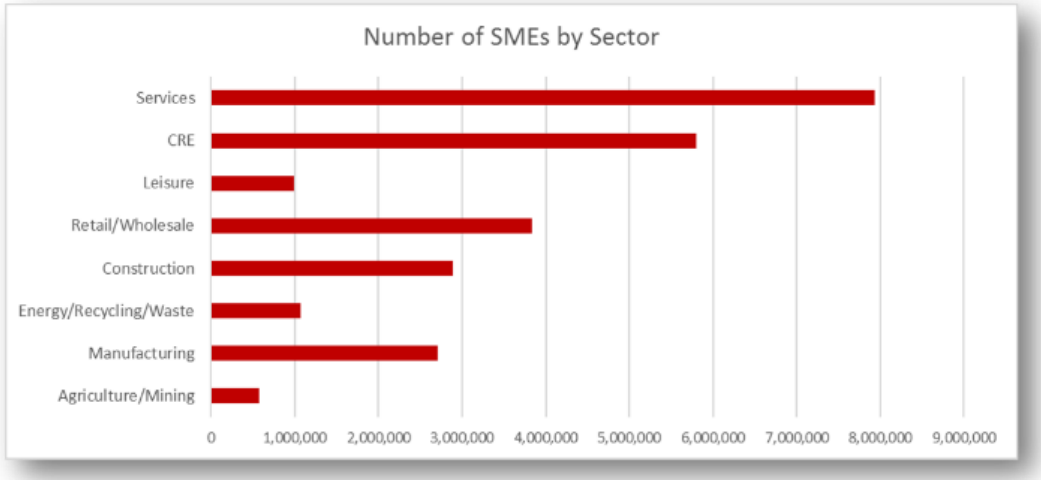
The UK SME Z-Score models



8 Sector models + 1 generic

for abridged accounts

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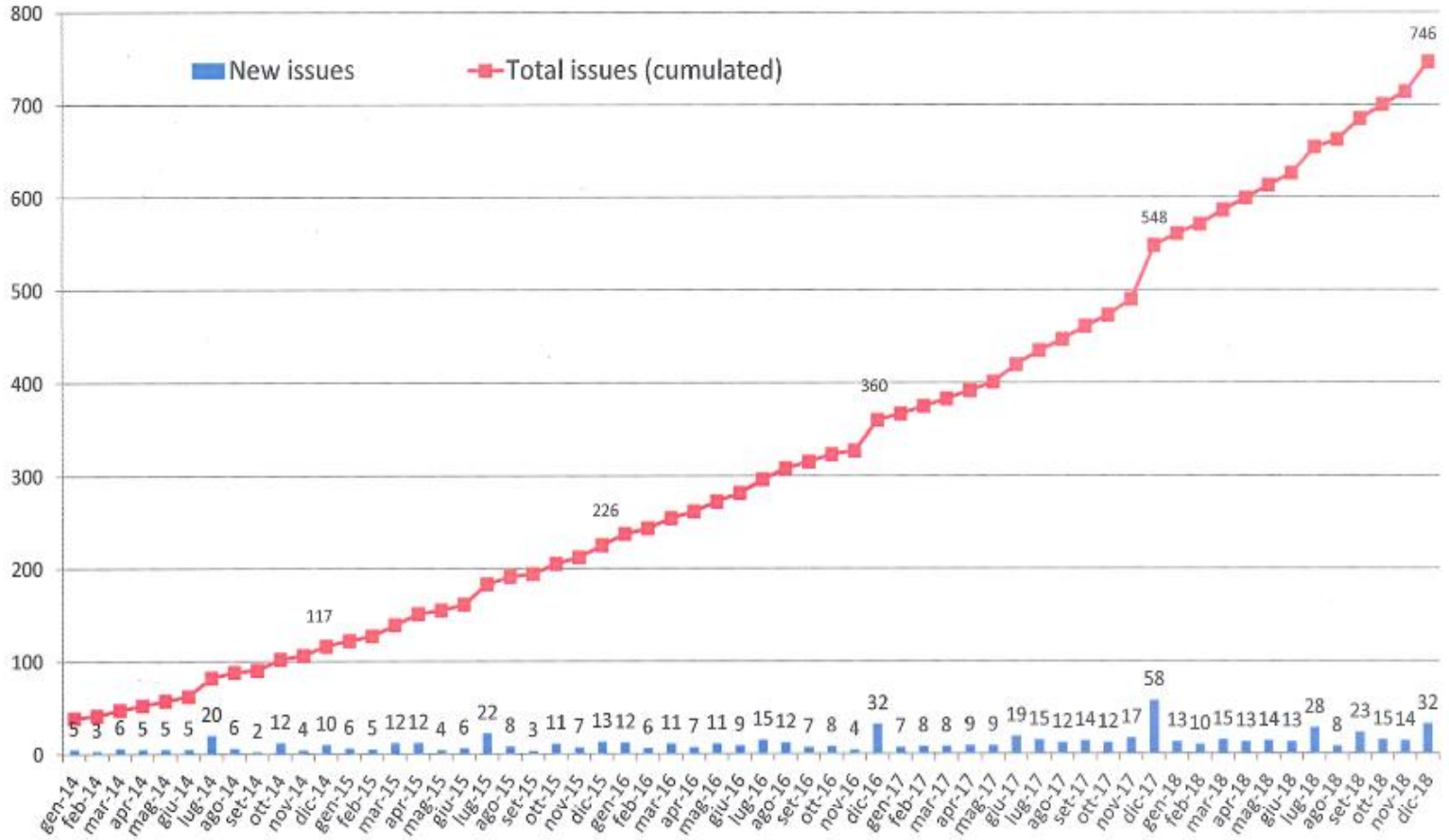
Assessing the Credit Worthiness of Italian SMEs and Mini-bond Issuers

Dr. Edward I. Altman, Professor of Finance, NYU Stern &
Co-founder, Wiserfunding Ltd., London, England

Minibond # flow (amount up to € 500 million)



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The Dataset

- Initially, financial data of 15,362 active and 1,000 non-active companies were extracted from AIDA (BvD) covering the years 2004 to 2014 (1).
- Few companies (1,852) had to be dropped due to missing financial information.
- The shape and size of the final development sample is reported below

	Number	Percentage
Non - defaulted firms	13,990	96.4 %
Defaulted firms	520	3.6 %
Total	14,510	100%

(1): We thank CLASSIS Capital and ASSOLOMBARDA for supporting this research by providing Italian SMEs data

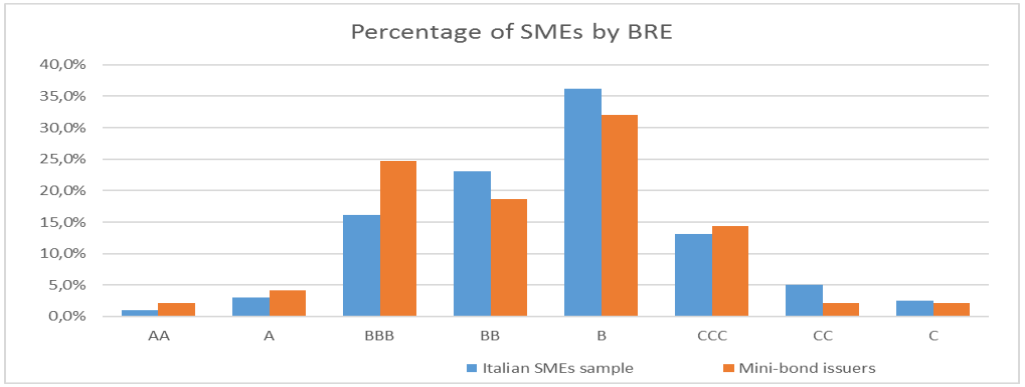
The Results

	Type I error rate	Type II error rate	1- Average Error Rate	Accuracy ratio
Manufacturing Model	6.92% (8.23%)	26.57% (27.64%)	83.26% (82.07%)	93.08% (92.21%)
Retail Model	16.77% (18.54%)	27.78% (28.89%)	77.73% (76.29%)	83.23% (81.76%)
Services Model	12.05% (14.88%)	24.54% (26.43%)	81.70% (79.35%)	87.94% (84.12%)
Constructions and Real Estate	8.89% (10.12%)	26.02% (28.24%)	82.55% (80.82%)	91.11% (89.86%)

Risk Profile of Mini-bond issuers (2015)

Bond Rating Equivalent	# SMEs	% SMEs	Avg. Coupon Yield
AA	2	2%	0,057
A	4	4%	0,062
BBB	24	25%	0,065
BB	18	19%	0,055
B	31	32%	0,059
CCC	14	14%	0,065
CC	2	2%	0,030
C	2	2%	0,060

Source: Firms listed on Borsa Italiana Extra MOT, calculations by the authors



Source: Firms listed on Borsa Italiana Extra MOT, calculations by the authors

Applying our SME Z_I-Score on the mini-bond issuers as of 2015, we find that:

- Risk profile of SMEs doesn't seem to influence the bond pricing;
- Majority of existing mini-bond issuers classified as non-investment grade;
- The risk profile of the mini-bond issuers is better (i.e. less risky) than total SME sample.

Wiserfunding Ltd.: Helping Italian SMEs to Succeed

- Mission is to support small business growth by reducing information asymmetry by providing a common set of information to all market participants.
- The SME Z_I-Score should not to be used in isolation. Other factor (e.g. debt capacity, cash flow, recovery profile, market outlook, directors' experience) are assessed when evaluating SMEs' financial strength.
- We believe that by providing lenders/investors and small businesses with the same set of information, we can help them speak the same language.
- We are working with Classis Capital, Borsa Italiana, Confindustria, several PMI organizations and SMEs to apply our model effectively.

50 Years of Altman Z-Score: what have we learned and the applications in financial and managerial markets

Edward Altman
Professor Emeritus of Finance at New York University, Stern School of Business

Chair: Dimitri Vayanos
Professor of Finance, FMG Director, LSE

#LSEAltman