
Defaults and Returns in the High Yield Bond Market

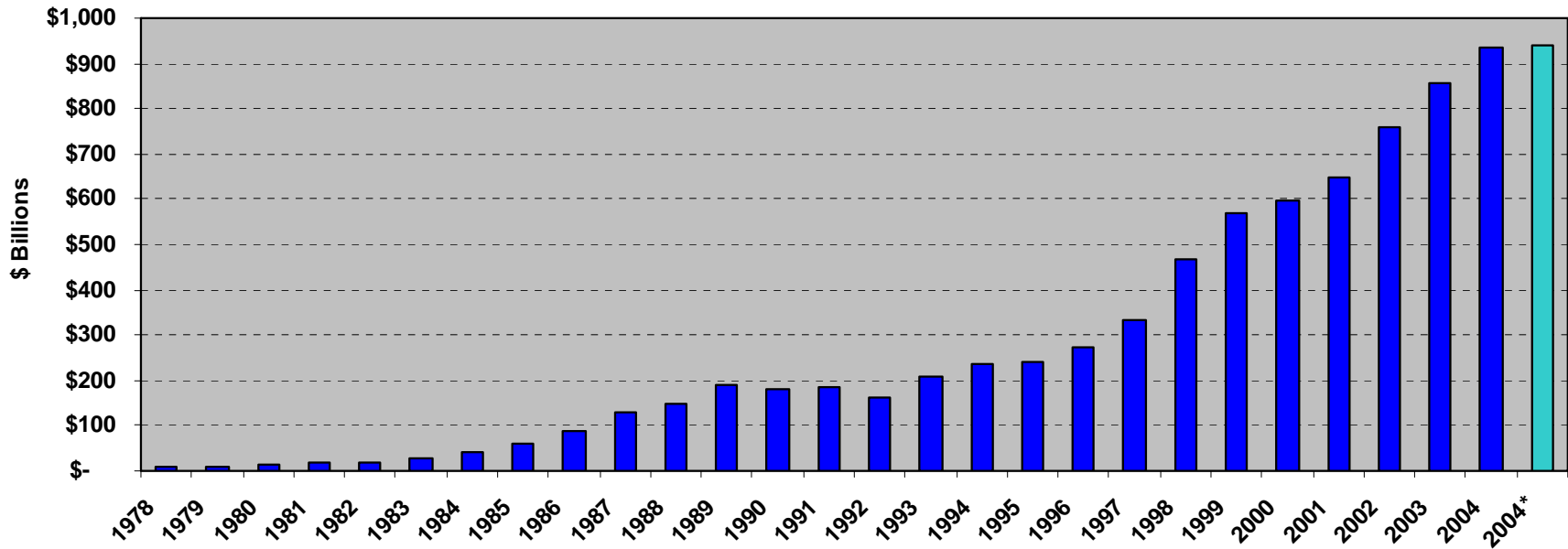
Size of Distressed Debt Market and Default Outlook for 2005 - 2006

Bankruptcy & Reorganization Class
Spring 2005

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Size of the US High-Yield Bond Market

1978 – 2004 (Mid-year US\$ billions, except for 2004*)



* Year End 2004

Historical Default Rates

Straight Bonds Only Excluding Defaulted Issues From Par Value Outstanding, 1971 – 2004 (US\$ millions)

Year	Par Value Outstanding ^a	Par Value Defaults	Default Rates (%)	Year	Par Value Outstanding ^a	Par Value Defaults	Default Rates (%)
12/31, 2004	\$933,100	\$11,657	1.249	1980	\$14,935	\$224	1.500
2003	\$856,000	\$38,451	4.661	1979	\$10,356	\$20	0.193
2002	\$757,000	\$96,855	12.795	1978	\$8,946	\$119	1.330
2001	\$649,000	\$63,609	9.801	1977	\$8,157	\$381	4.671
2000	\$597,200	\$30,295	5.073	1976	\$7,735	\$30	0.388
1999	\$567,400	\$23,532	4.147	1975	\$7,471	\$204	2.731
1998	\$465,500	\$7,464	1.603	1974	\$10,894	\$123	1.129
1997	\$335,400	\$4,200	1.252	1973	\$7,824	\$49	0.626
1996	\$271,000	\$3,336	1.231	1972	\$6,928	\$193	2.786
1995	\$240,000	\$4,551	1.896	1971	\$6,602	\$82	1.242
1994	\$235,000	\$3,418	1.454				
1993	\$206,907	\$2,287	1.105				
1992	\$163,000	\$5,545	3.402				
1991	\$183,600	\$18,862	10.273				
1990	\$181,000	\$18,354	10.140				
1989	\$189,258	\$8,110	4.285				
1988	\$148,187	\$3,944	2.662				
1987	\$129,557	\$7,486	5.778				
1986	\$90,243	\$3,156	3.497				
1985	\$58,088	\$992	1.708				
1984	\$40,939	\$344	0.840				
1983	\$27,492	\$301	1.095				
1982	\$18,109	\$577	3.186				
1981	\$17,115	\$27	0.158				

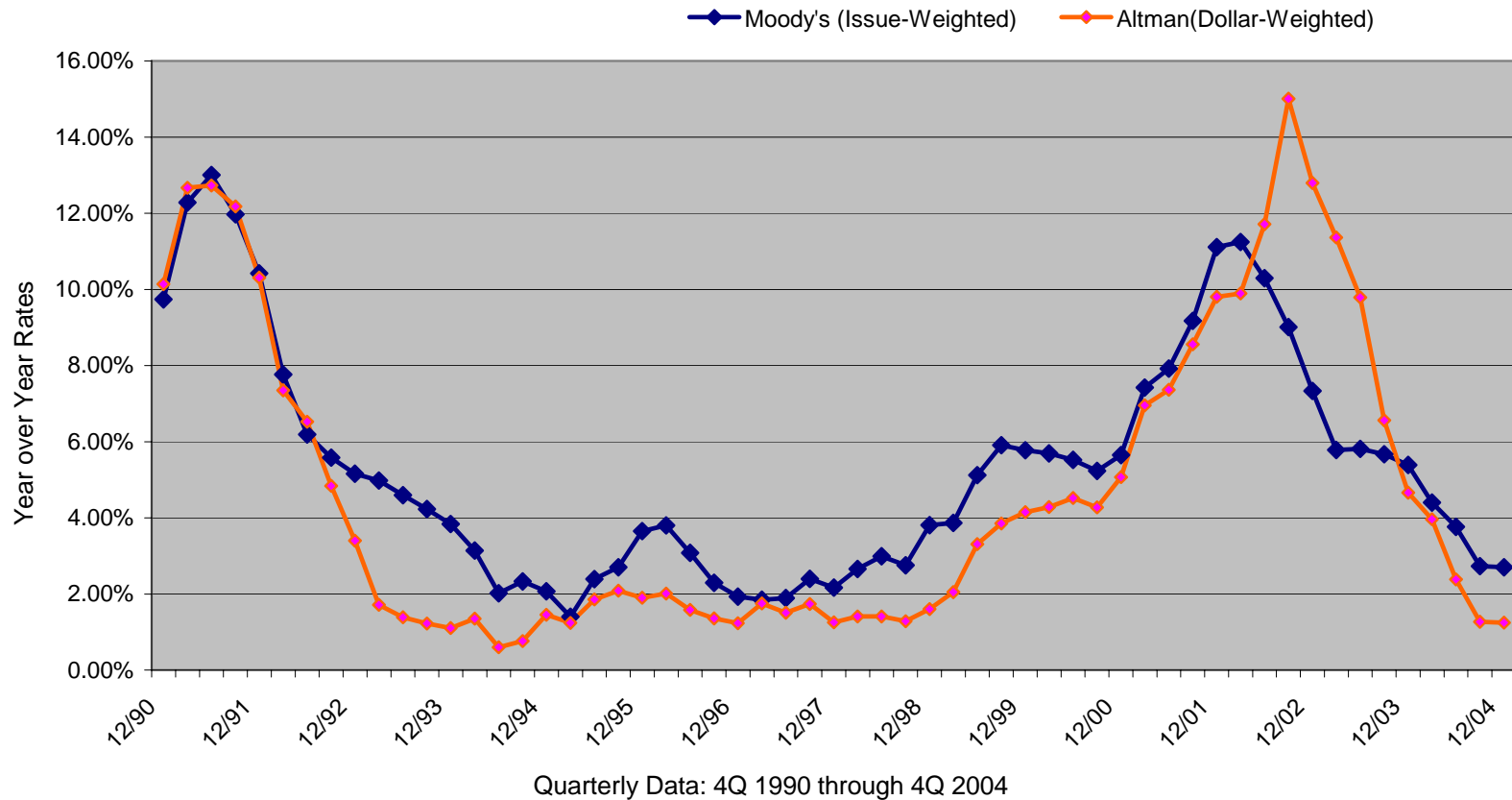
	Standard Deviation (%)	
Arithmetic Average Default Rate		
1971 to 2004	3.232%	3.134%
1978 to 2004	3.567%	3.361%
1985 to 2004	4.401%	3.501%
Weighted Average Default Rate^b		
1971 to 2004	4.836%	
1978 to 2004	4.858%	
1985 to 2004	4.929%	
Median Annual Default Rate		
1971 to 2004	1.802%	

^a As of mid-year

^b Weighted by par value of amount outstanding for each year.

Source: Author's compilation and Salomon Smith Barney

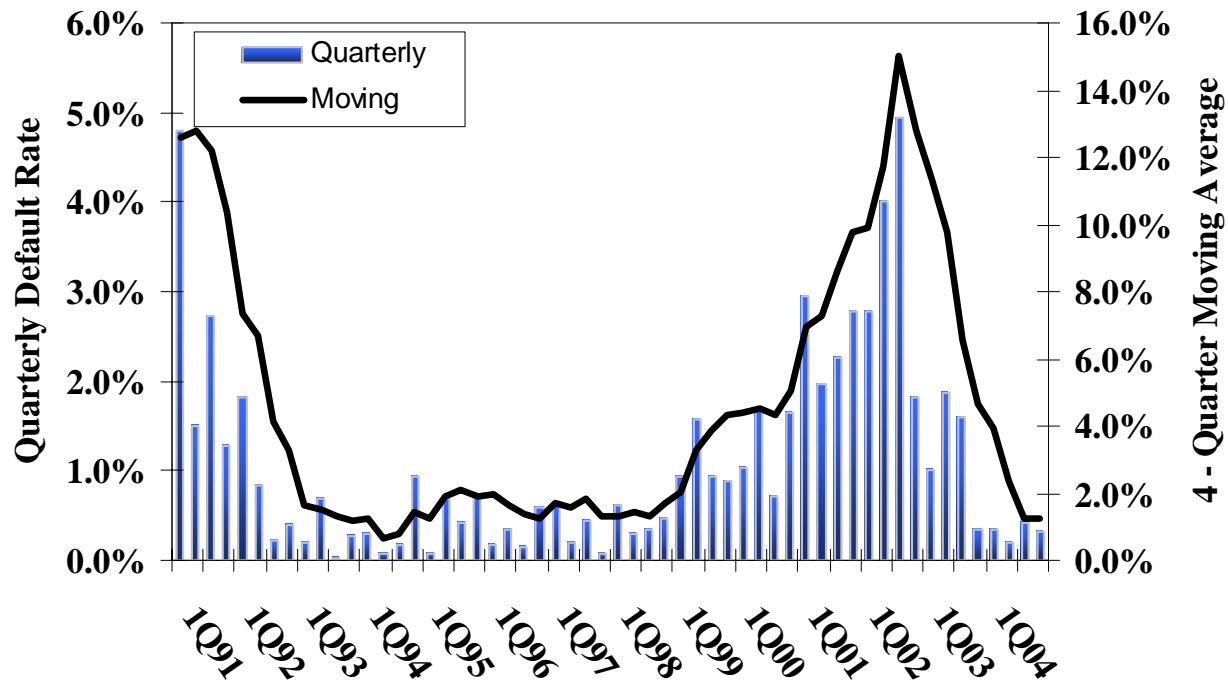
US High-Yield Bond Default Rates: *Issuer vs. Dollar Volume*



Source: Edward Altman & Juan Martin Aguiar, NYU Salomon Center – Stern School of Business

Historical Default Rates

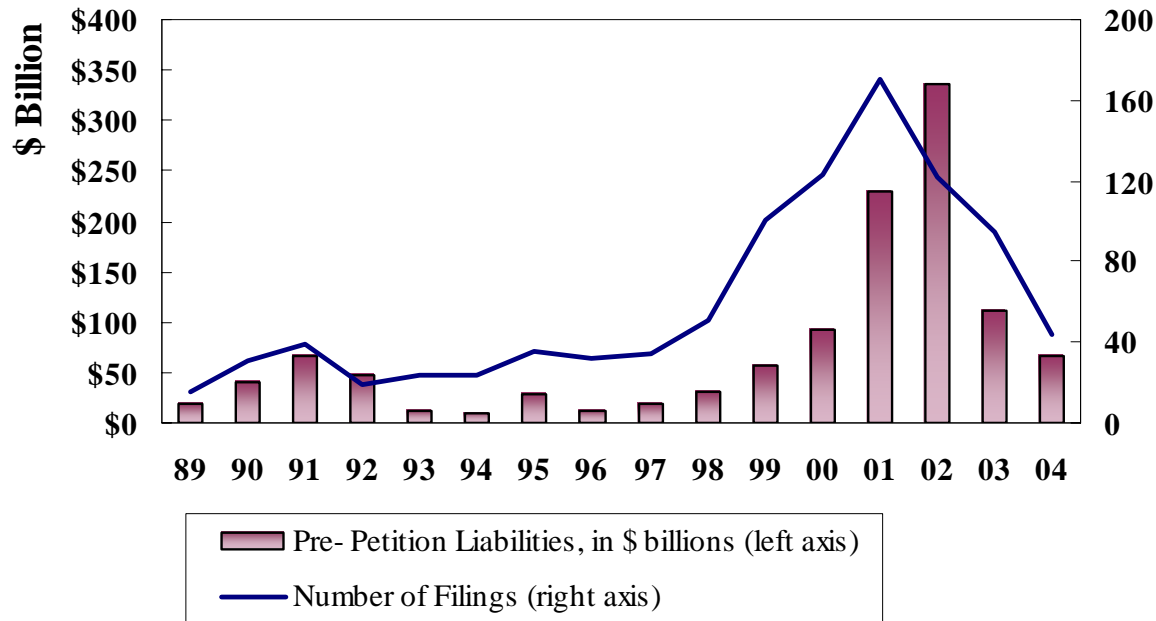
QUARTERLY DEFAULT RATE AND FOUR QUARTER MOVING AVERAGE
1992 -2004



Filings for Chapter 11

Number of Filings and Pre-petition Liabilities of Public Companies

1989-2004



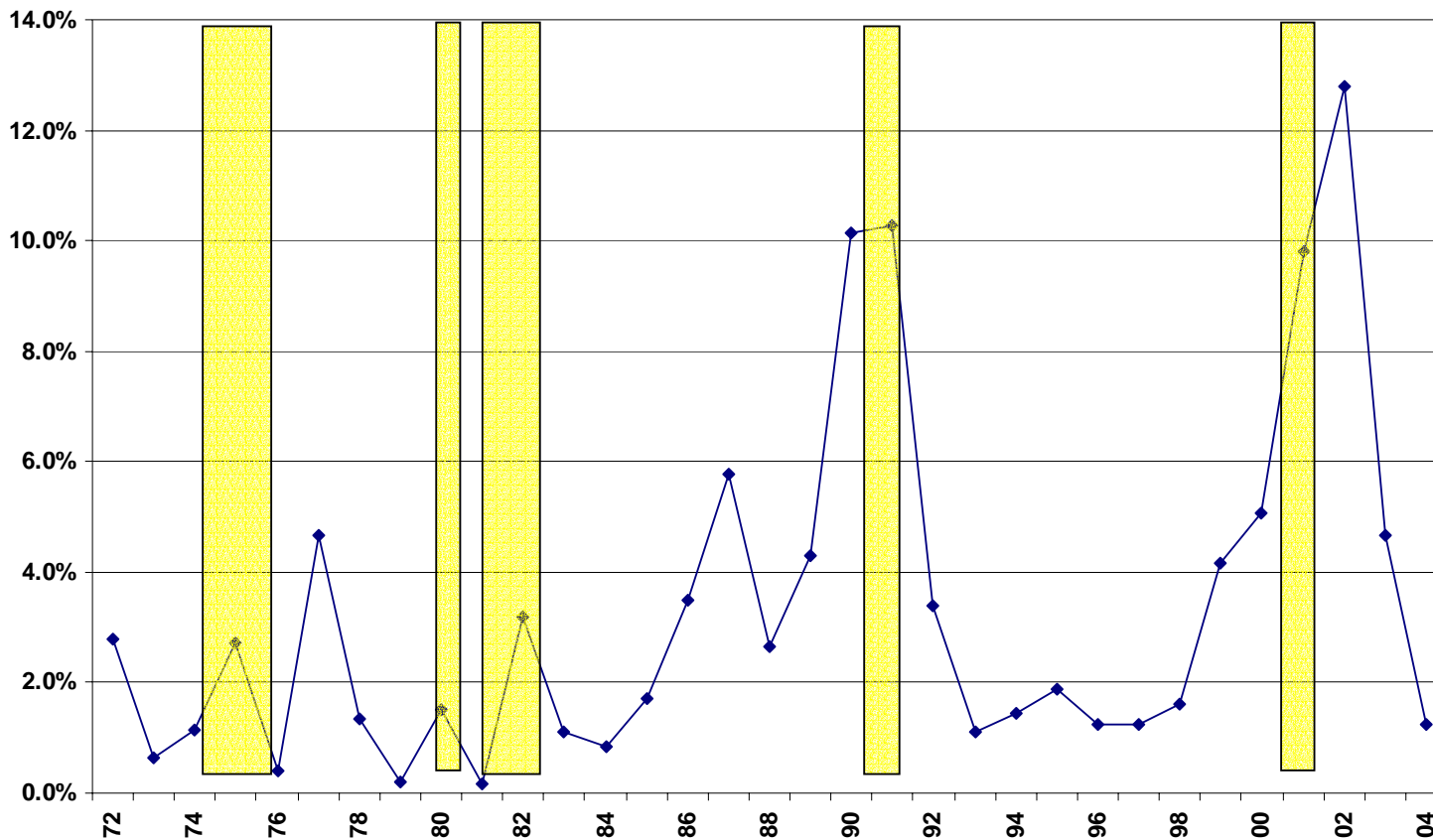
2003
95 filings and pre-petition liabilities of \$110.4 billion

2004
44 filings and liabilities of \$66.3 billion

Note: Minimum \$100 million in liabilities
Source: NYU Salomon Center Bankruptcy Filings Database

Historical Default Rates and Recession Periods in the U.S.

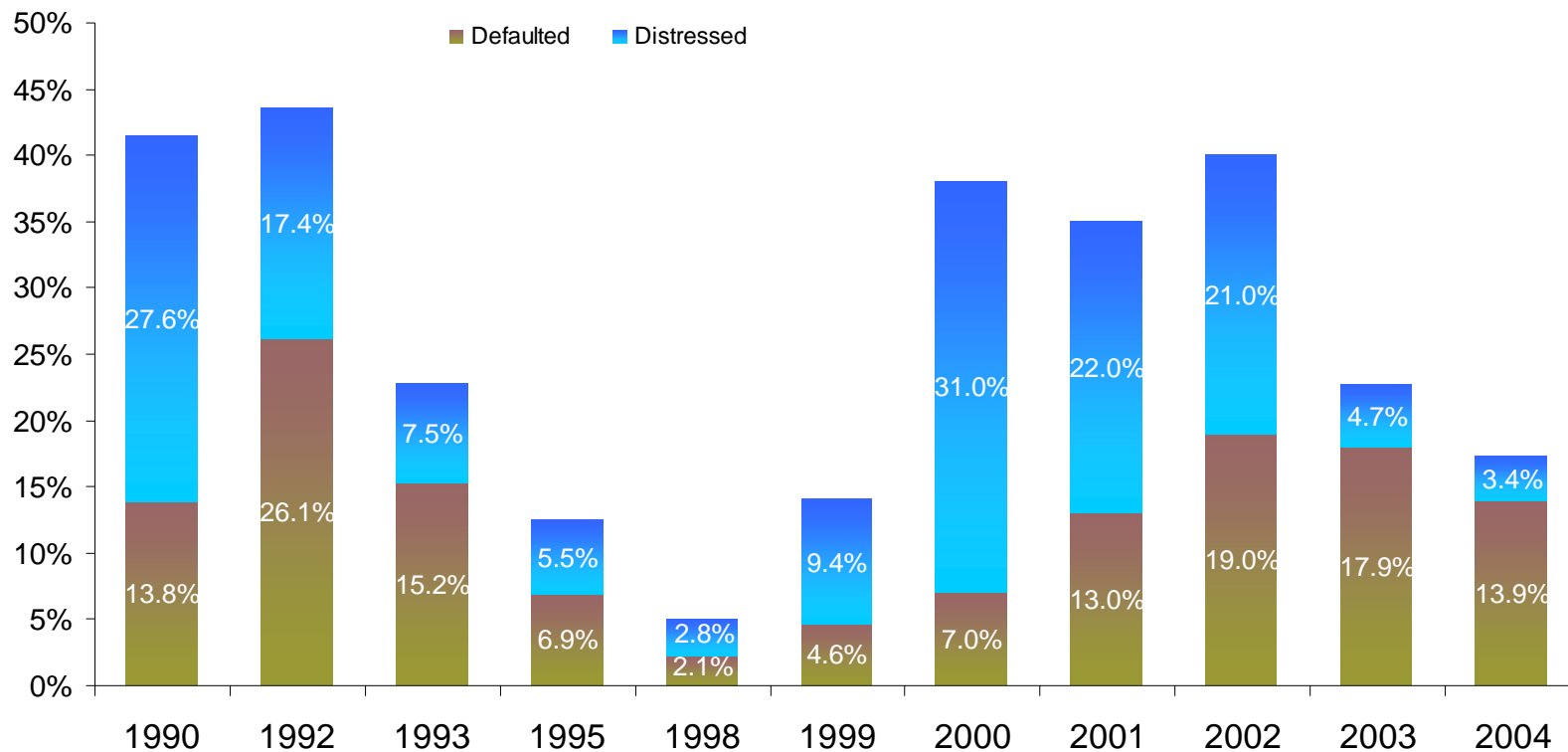
HIGH YIELD BOND MARKET 1972 –2004



Periods of Recession: 11/73 - 3/75, 1/80 - 7/80, 7/81 - 11/82, 7/90 - 3/91, 4/01 – 12/01

Source: E. Altman (NYU Salomon Center) & National Bureau of Economic Research

Distressed And Defaulted Debt as a Percentage of Total High Yield Debt Market



Public deals only.
Source: Citigroup Estimates.

Estimated Face And Market Values Of Defaulted And Distressed Debt

	<u>Face Value</u>		<u>Market Value</u>			
	12/31/2003	12/31/2004	12/31/2003	xFV	12/31/2004	xFV
<u>Public Debt</u>						
Defaulted	\$ 193.6	\$ 152.0 ⁽¹⁾	\$ 87.1	0.45	\$ 76.0	0.50
Distressed	\$ 50.5	\$ 36.6 ⁽²⁾	\$ 32.8	0.65	\$ 23.8	0.65
Total Public	\$ 244.1	\$ 188.6	\$ 119.9		\$ 99.8	
<u>Private Debt</u>						
Defaulted	\$ 425.9	\$ 334.4 ⁽³⁾	\$ 298.1	0.70	\$ 234.1 ⁽³⁾	0.70
Distressed	\$ 111.1	\$ 80.6 ⁽³⁾	\$ 94.4	0.85	\$ 68.5 ⁽³⁾	0.85
Total Private	\$ 537.0	\$ 415.0	\$ 392.6		\$ 302.6	
Total Public and Private	\$ 781.1	\$ 603.6	\$ 512.5		\$ 402.4	

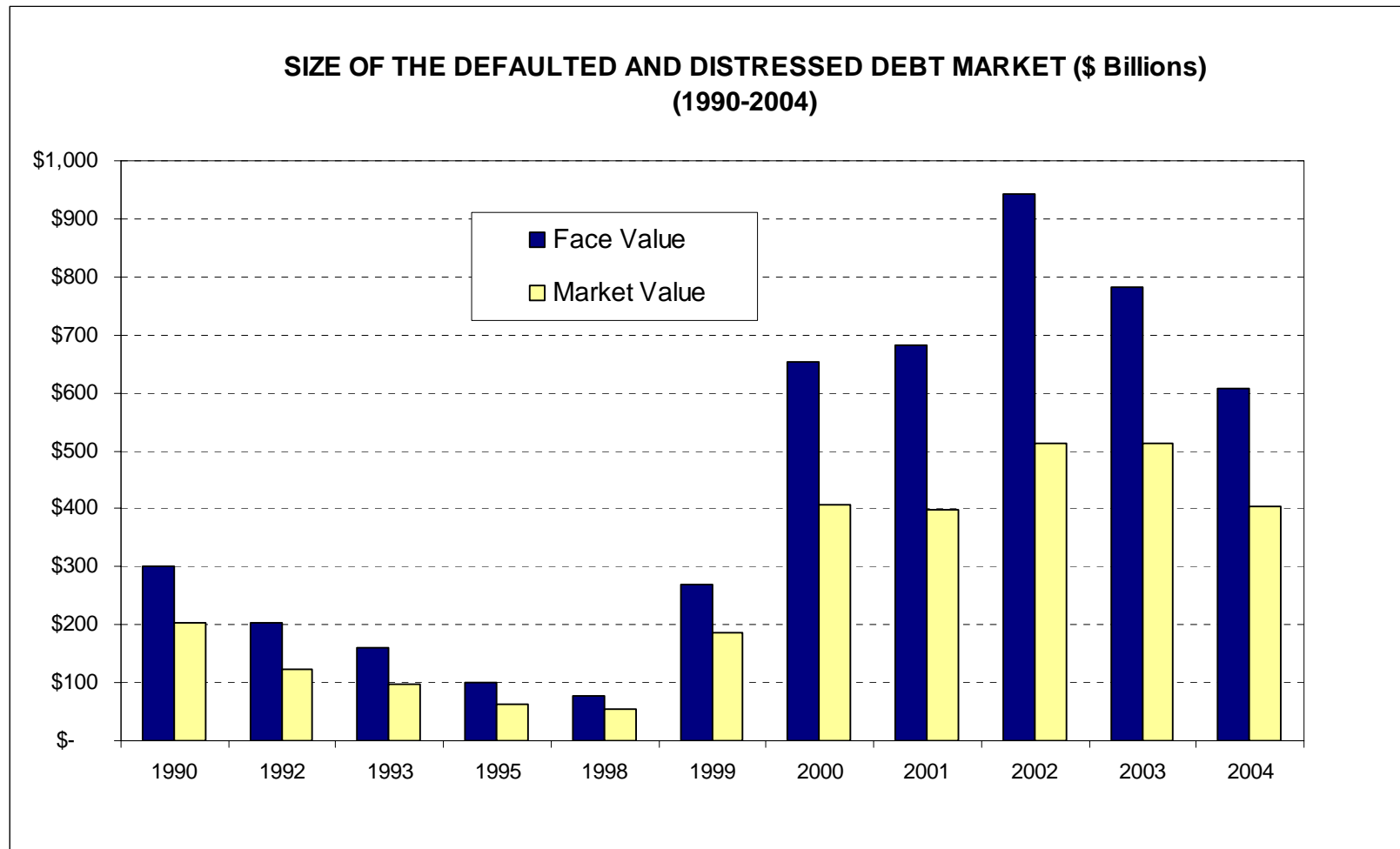
(1) Calculated using: (2003 defaulted population) + (2004 defaults) - (2004 Emergences)

(2) Based on 3.9% of size of high yield market (\$939.3 billion).

(3) For 12/31/03 and 12/31/04, we use a private/public ratio of 2.20.

Source: Edward Altman, NYU Salomon Center, Stern School of Business

Size of Defaulted And Distressed Debt Market (\$ Billions) (1990 - 2004)



Source: E. Altman, NYU Salomon Center .

2004 Default Loss Rate

	Unadjusted for Fallen Angels	Only Fallen Angels	All except Fallen Angels	Price Adjusted for Fallen Angels
BACKGROUND DATA				
AVERAGE DEFAULT RATE, 2004	1.249%	0.942%	1.322%	1.267%
AVERAGE PRICE AT DEFAULT (a)	57.675%	60.025%	57.354%	57.739%
AVERAGE PRICE AT DOWNGRADE (a)		88.994%		
AVERAGE RECOVERY	57.675%	67.449%	57.354%	58.810%
AVERAGE LOSS OF PRINCIPAL	42.325%	32.551%	42.646%	41.190%
AVERAGE COUPON PAYMENT	10.296%	6.204%	10.985%	10.296%
DEFAULT LOSS COMPUTATION				
DEFAULT RATE	1.249%	0.942%	1.322%	1.267%
X LOSS OF PRINCIPAL	<u>42.325%</u>	<u>32.551%</u>	<u>42.646%</u>	<u>41.190%</u>
DEFAULT LOSS OF PRINCIPAL	0.529%	0.307%	0.564%	0.522%
DEFAULT RATE	1.249%	0.942%	1.322%	1.267%
X LOSS OF 1/2 COUPON	<u>5.148%</u>	<u>3.102%</u>	<u>5.493%</u>	<u>5.148%</u>
DEFAULT LOSS OF COUPON	0.064%	0.029%	0.073%	0.065%
DEFAULT LOSS OF PRINCIPAL AND COUPON	0.593%	0.336%	0.636%	0.587%

(a) If default date price is not available, end-of-month price is used.

Source: Author's Compilations and various dealer quotes.

Default Rates and Losses^a

1978 – 2004

Year	Par Value Outstanding ^a (\$MM)	Par Value Of Default (\$MMs)	Default Rate (%)	Weighted Price After Default	Weighted Coupon (%)	Default Loss (%)
2004	\$933,100	\$11,657	1.25	\$57.7	10.30	0.59
2003	\$825,000	\$ 38,451	4.66	\$45.5	9.55	2.76
2002	\$757,000	\$96,858	12.79	\$25.3	9.37	10.15
2001	\$649,000	\$63,609	9.80	\$25.5	9.18	7.76
2000	\$597,200	\$30,248	5.06	\$26.4	8.54	3.94
1999	\$567,400	\$23,532	4.15	\$27.9	10.55	3.21
1998	\$465,500	\$7,464	1.60	\$35.9	9.46	1.10
1997	\$335,400	\$4,200	1.25	\$54.2	11.87	0.65
1996	\$271,000	\$3,336	1.23	\$51.9	8.92	0.65
1995	\$240,000	\$4,551	1.90	\$40.6	11.83	1.24
1994	\$235,000	\$3,418	1.45	\$39.4	10.25	0.96
1993	\$206,907	\$2,287	1.11	\$56.6	12.98	0.56
1992	\$163,000	\$5,545	3.40	\$50.1	12.32	1.91
1991	\$183,600	\$18,862	10.27	\$36.0	11.59	7.16
1990	\$181,000	\$18,354	10.14	\$23.4	12.94	8.42
1989	\$189,258	\$8,110	4.29	\$38.3	13.40	2.93
1988	\$148,187	\$3,944	2.66	\$43.6	11.91	1.66
1987	\$129,557	\$7,486	5.78	\$75.9	12.07	1.74
1986	\$90,243	\$3,156	3.50	\$34.5	10.61	2.48
1985	\$58,088	\$992	1.71	\$45.9	13.69	1.04
1984	\$40,939	\$344	0.84	\$48.6	12.23	0.48
1983	\$27,492	\$301	1.09	\$55.7	10.11	0.54
1982	\$18,109	\$577	3.19	\$38.6	9.61	2.11
1981	\$17,115	\$27	0.16	\$12.0	15.75	0.15
1980	\$14,935	\$224	1.50	\$21.1	8.43	1.25
1979	\$10,356	\$20	0.19	\$31.0	10.63	0.14
1978	\$8,946	\$119	1.33	\$60.0	8.38	0.59
Arithmetic Average 1978-2004:			3.57	\$43.0	10.98	2.45
Weighted Average 1978-2004:			4.86			3.51

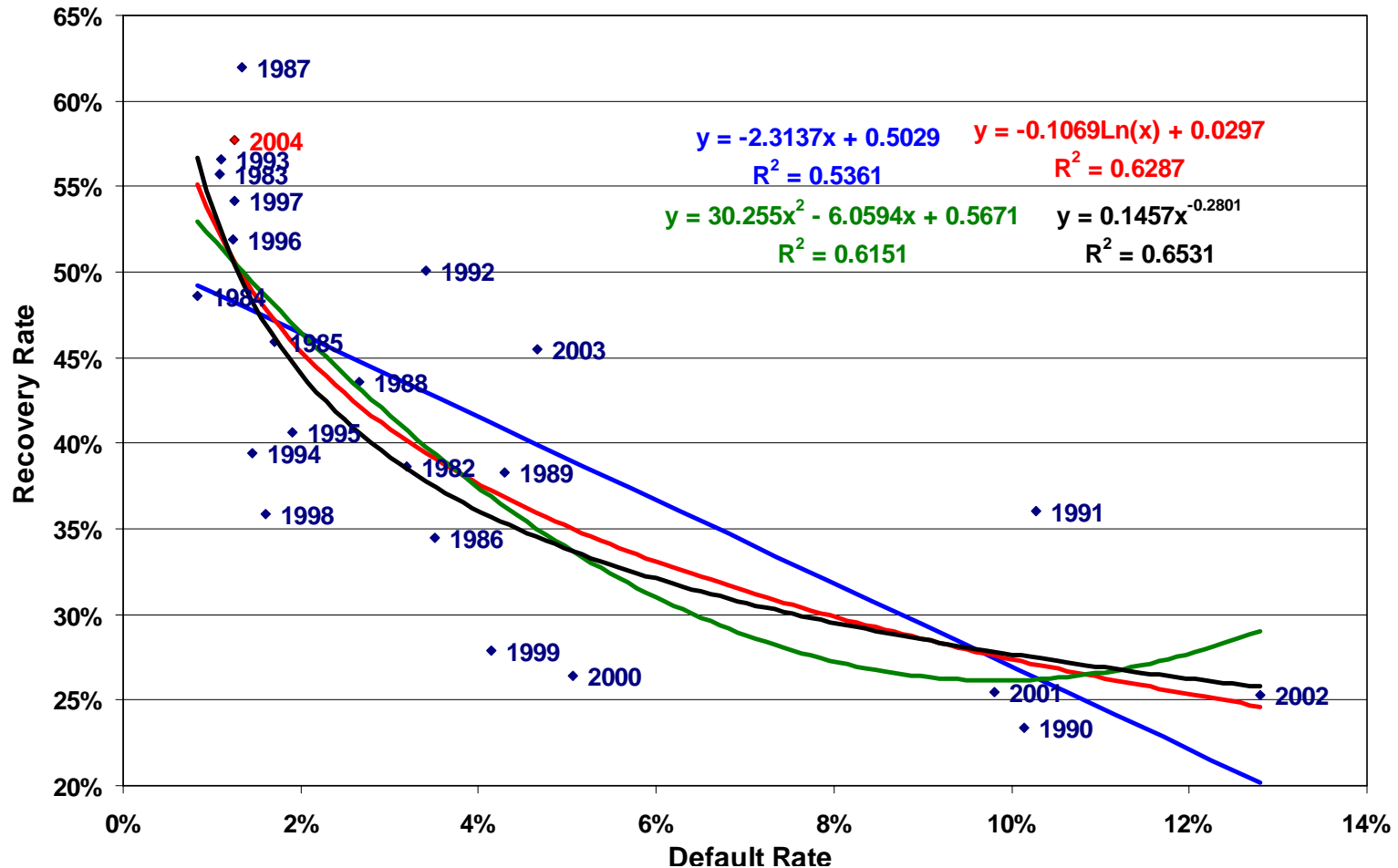
^a Excludes defaulted issues.

Source: Authors' compilations and various dealer price quotes.

Recovery Rate/Default Rate Association

Altman Defaulted Bonds Data Set (1982-2004)

Dollar Weighted Average Recovery Rates to Dollar Weighted Average Default Rates



Source: E. Altman, et. al., "The Link Between Default and Recovery Rates", NYU Salomon Center, S-03-4.

Defaults by Original Rating

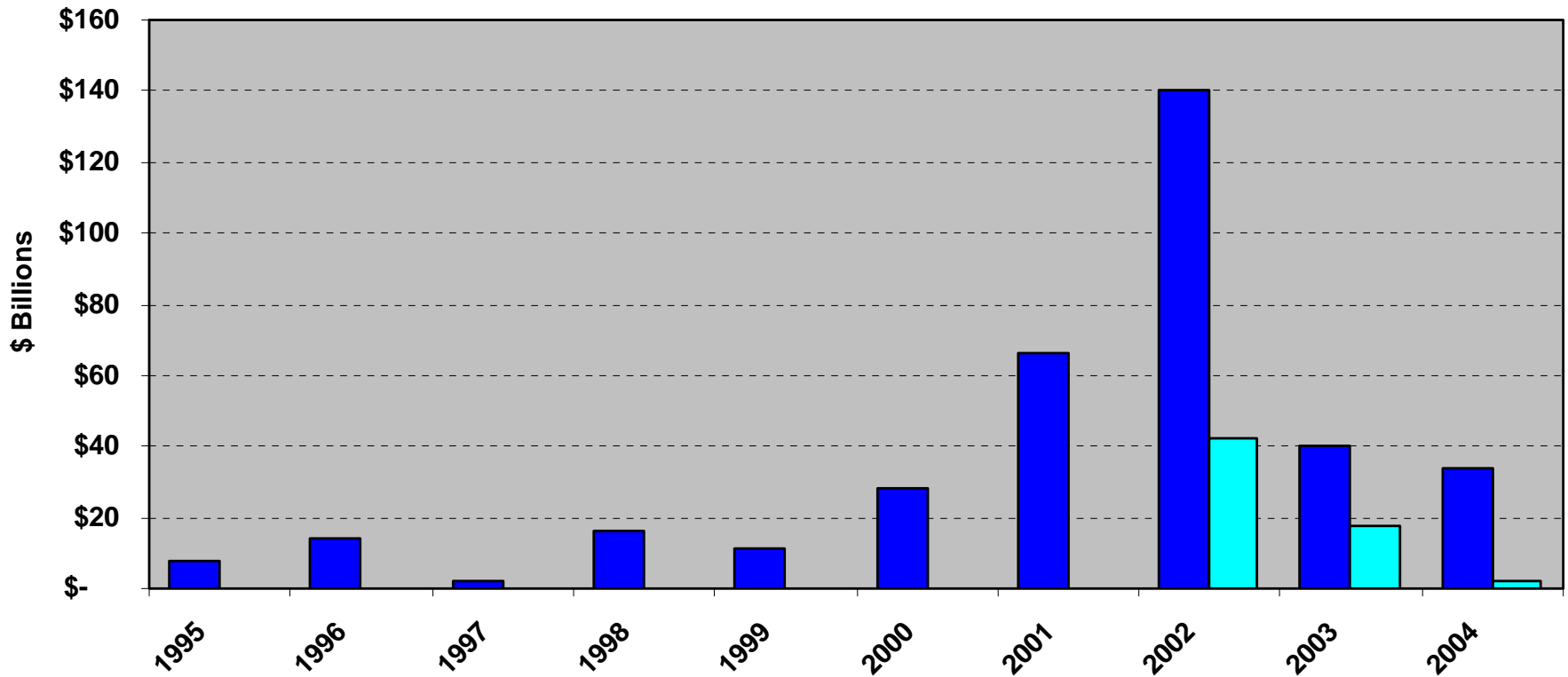
	Defaulted Issues*	% Originally Rated Investment Grade	% Originally Rated Non-Investment Grade
2004	79	19%	81%
2003	203	33%	67%
2002	322	39%	61%
2001	258	14%	86%
2000	142	16%	84%
1999	87	13%	87%
1998	39	31%	69%
1997	20	0%	100%
1996	24	13%	88%
1995	29	10%	90%
1994	16	0%	100%
1993	24	0%	100%
1992	59	25%	75%
1991	163	27%	73%
1990	117	16%	84%
1989	66	18%	82%
1988	64	42%	58%
1987	31	39%	61%
1986	55	15%	85%
1985	26	4%	96%
1984	14	21%	79%
1983	7	43%	57%
1982	20	55%	45%
1981	1	0%	100%
1980	4	25%	75%
1979	1	0%	100%
1978	1	100%	0%
1977	2	100%	0%
Total	1,874	24%	76%

* Where we could find an original rating from either S&P or Moody's.

Source: Authors' Compilations from S&P and Moody's records.

Volume of New Fallen Angels and Fallen Angel Defaults

1995 – 2004 (US\$ billions)



Source: NYU Salomon Center Defaults Database, Citigroup.

Fallen Angels companies defaulting in 2003 and 2004

2003		\$MM
AES Drax Holdings (Energy)	\$	302.4
AMERCO	\$	475.0
Cone Mills Corp.	\$	100.0
Fleming Cos. Inc.	\$	5.9
HEALTHSOUTH Corp.	\$	2,470.9
Marconi PLC	\$	1,538.9
Mirant Corp.	\$	4,018.9
Mississippi Chemical Corp.	\$	200.0
NorthWestern Corp.	\$	1,436.1
NRG Energy, Inc.	\$	3,986.8
Petroleum Geo-Services ASA	\$	1,460.0
PG&E Corp. - USGen New England, Inc.	\$	1,221.6
Solutia Inc.	\$	450.0
Trenwick Group Ltd.	\$	130.0
	Total	\$ 17,796.5
	% of Default Volume	46.3%
2004		\$MM
US Air Inc.	\$	1,673.4
Foster Wheeler Ltd.	\$	7.9
	Total	\$ 1,681.3

* Only those issues of the issuer that were rated BBB- or above at some point of time prior to default have been considered.

Source: S&p, Moody's and author's compilation.

Fallen Angel(FA) Vs Original Issue & All High Yield Default Rates : 1985-2004 (Issuer Based)

Year	Fallen Angel Average 12 Month Default Rate*	Original Issue Speculative Grade Default Rates*	All Speculative Grade Bond Default Rates*	Altman Dollar Weighted Annual Default Rates
2004	0.83%	2.65%	2.29%	1.25%
2003	5.88%	5.46%	5.53%	4.66%
2002	6.59%	8.55%	8.32%	12.79%
2001	8.46%	10.14%	10.99%	9.81%
2000	7.01%	7.10%	7.03%	5.07%
1999	4.01%	5.10%	4.62%	4.15%
1998	3.31%	2.75%	2.23%	1.60%
1997	2.04%	2.10%	1.71%	1.25%
1996	1.38%	2.00%	1.71%	1.23%
1995	0.25%	3.90%	3.07%	1.90%
1994	0.00%	2.31%	1.70%	1.45%
1993	1.72%	1.99%	1.79%	1.10%
1992	4.50%	5.48%	5.45%	3.40%
1991	7.53%	10.86%	11.66%	10.27%
1990	5.77%	8.30%	8.20%	10.14%
1989	3.74%	4.93%	5.33%	4.29%
1988	4.25%	3.39%	3.95%	2.66%
1987	4.36%	2.92%	2.41%	5.78%
1986	2.46%	6.29%	4.78%	3.50%
1985	6.77%	4.06%	3.24%	1.71%
Arithmetic Average	4.04%	5.01%	4.80%	4.40%
Weighted Average(By number of issuers)	4.22%	5.15%	5.10%	4.39%
Standard Deviation	2.53%	2.76%	3.06%	3.59%

Source: Author Compilation from Standard & Poor's "Credit Pro" Database

*Each year's figure is based on the one year average of the 12 months for that year.

Fallen Angels: an Analysis of Recovery Rates and Loss Rate on Default (1982-2004)

SUMMARY STATISTICS

	Price at Default	Price at Downgrade	Recovery	Years to default
Mean	54.88	75.64	0.73	2.41
Median	55.22	76.94	0.75	2.10
Standard Deviation	18.02%	11.97%	0.25%	2.15%

Analysis by Year of Default

	Price at Default	Price at Downgrade	Recovery	Years to default	# of Data points	Fallen Angels (\$ MM)
1982 Average	38.59	52.94	72.9%	0.54	10	498
1983 Average	71.17	89.08	79.9%	6.11	3	47
1984 Average	70.54	85.25	82.7%	1.79	3	47
1985 Average	36.63	67.75	54.1%	1.25	1	21
1986 Average	44.78	77.40	57.9%	3.54	10	317
1987 Average	71.85	82.77	86.8%	1.80	11	2,905
1988 Average	53.49	75.95	70.4%	3.77	22	741
1989 Average	53.39	66.75	80.0%	0.07	10	1,155
1990 Average	35.70	76.48	46.7%	2.41	17	1,516
1991 Average	67.28	86.92	77.4%	1.16	37	1,902
1992 Average	79.13	94.45	83.8%	3.04	7	133
1995 Average	69.00	67.06	102.9%	0.00	2	125
1999 Average	30.43	84.64	35.9%	2.56	7	1,013
2000 Average	29.46	80.76	36.5%	0.80	13	2,300
2001 Average	86.00	62.72	137.1%	0.33	17	3,825
2002 Average	33.38	59.79	55.8%	2.90	113	40,987
2003 Average	56.95	61.78	92.2%	2.90	66	17,797
2004 Average	60.03	88.99	67.4%	8.38	15	1,681
Arithmetic Average	54.88	75.64	73.4%	2.41	364	77,010
Weighted Average¹	44.96	64.25	70.0%	2.68		
Median	55.22	76.94	75.2%	2.10		
SD	18.0%	12.0%	0.2%	2.2%		

1 - Weighted by \$ outstanding

Fallen Angels Returns in Default (Preliminary Results)

Straight Return on Investment

	6 MONTH RETURN		12 MONTH RETURN		24 MONTH RETURN		ULTIMATE	
	Straight	Annualized	Straight	Annualized	Straight	Annualized	Straight	Annualized
Mean	7.93%	32.06%	16.25%	16.25%	34.85%	12.54%	70.69%	31.84%
Annualized from Above		16.48%				16.12%		
Median	7.65%	15.88%	13.18%	13.18%	20.15%	9.61%	40.62%	15.02%
St. Dev.	39.57%	108.61%	72.37%	72.37%	71.33%	28.74%	128.70%	97.66%
Number of Issues:	194		175		116		176	

Excess Return on Investment

	6 MONTH RETURN		12 MONTH RETURN		24 MONTH RETURN		ULTIMATE	
	Straight	Annualized	Straight	Annualized	Straight	Annualized	Straight	Annualized
Mean	3.44%	19.36%	7.95%	7.95%	14.71%	3.22%	33.56%	22.50%
Annualized from Above		7.00%				7.10%		
Median	3.44%	7.01%	3.77%	3.77%	-4.99%	-1.14%	9.64%	7.01%
St. Dev.	35.24%	99.32%	69.98%	69.98%	79.41%	33.33%	121.23%	88.46%
Number of Issues:	193		173		116		157	

Weighted Average (by Issue) Recovery Rates

On Defaulted Debt by Seniority Per \$100 Face Amount 1978 – 2004

Default	Senior Secured		Senior Unsecured		Senior Subordinated		Subordinated		Discount and Zero Coupon		All Seniorities	
	No.	\$	No.	\$	No.	\$	No.	\$	No.	\$	No.	\$
2004	27	\$63.67	33	\$56.77	2	\$37.44	0	\$0.00	7	\$43.06	69	\$57.52
2003	57	\$53.51	108	\$45.40	29	\$35.98	1	\$38.00	8	\$32.27	203	\$45.78
2002	37	\$52.81	254	\$21.82	21	\$32.79	0	\$0.00	28	\$26.47	340	\$26.25
2001	9	\$40.95	187	\$28.84	48	\$18.37	0	\$0.00	37	\$15.05	281	\$25.62
2000	13	\$39.58	47	\$25.40	61	\$25.96	26	\$26.62	17	\$23.61	164	\$26.74
1999	14	\$26.90	60	\$42.54	40	\$23.56	2	\$13.88	11	\$17.30	127	\$32.20
1998	6	\$70.38	21	\$39.57	6	\$17.54	0	0.00	1	\$17.00	34	\$40.46
1997	4	\$74.90	12	\$70.94	6	\$31.89	1	\$60.00	2	\$19.00	25	\$57.61
1996	4	\$59.08	4	\$50.11	9	\$48.99	4	\$44.23	3	\$11.99	24	\$45.44
1995	5	\$44.64	9	\$50.50	17	\$39.01	1	\$20.00	1	\$17.50	33	\$41.77
1994	5	\$48.66	8	\$51.14	5	\$19.81	3	\$37.04	1	\$5.00	22	\$39.44
1993	2	\$55.75	7	\$33.38	10	\$51.50	9	\$28.38	4	\$31.75	32	\$38.83
1992	15	\$59.85	8	\$35.61	17	\$58.20	22	\$49.13	5	\$19.82	67	\$50.03
1991	4	\$44.12	69	\$55.84	37	\$31.91	38	\$24.30	9	\$27.89	157	\$40.67
1990	12	\$32.18	31	\$29.02	38	\$25.01	24	\$18.83	11	\$15.63	116	\$24.66
1989	9	\$82.69	16	\$53.70	21	\$19.60	30	\$23.95			76	\$35.97
1988	13	\$67.96	19	\$41.99	10	\$30.70	20	\$35.27			62	\$43.45
1987	4	\$90.68	17	\$72.02	6	\$56.24	4	\$35.25			31	\$66.63
1986	8	\$48.32	11	\$37.72	7	\$35.20	30	\$33.39			56	\$36.60
1985	2	\$74.25	3	\$34.81	7	\$36.18	15	\$41.45			27	\$41.78
1984	4	\$53.42	1	\$50.50	2	\$65.88	7	\$44.68			14	\$50.62
1983	1	\$71.00	3	\$67.72			4	\$41.79			8	\$55.17
1982			16	\$39.31			4	\$32.91			20	\$38.03
1981	1	\$72.00									1	\$72.00
1980			2	\$26.71			2	\$16.63			4	\$21.67
1979							1	\$31.00			1	\$31.00
1978			1	\$60.00							1	\$60.00
Total/Average	256	\$54.15	947	\$35.77	399	\$30.17	248	\$31.06	145	\$22.15	1,995	\$35.43
Median		\$55.75		\$42.54		\$32.79		\$31.00		\$19.00		\$40.67

Recovery at Default* on Public Corporate Bonds (1978-2004) and Bank Loans (1989-2004)

Loan/Bond Seniority	Number of Issues	Median	Mean %	Deviation
Senior Secured Loans	251	69.34	75.00	24.40
Senior Unsecured Loans	52	53.23	49.25	28.40
Senior Secured Bonds	256	55.75	52.84	23.05
Senior Unsecured Bonds	947	42.54	34.89	26.62
Senior Subordinated Bonds	399	32.79	30.17	24.97
Subordinated Bonds	248	31.00	29.03	22.53
Discount Bonds	145	19.00	20.93	17.64
Total Sample Bonds	1,995	40.05	34.31	24.87

**Based on prices just after default on bonds and 30 days after default on loans.*

Source: K. Emery (Moody's), 2004 (Bank Loans) and Altman & Aguiar, 2004 (Bonds).

Investment Grade vs. Non-Investment Grade (Original Rating) Prices at Default on Public Bonds (1974-2003)

Bond Seniority	Number of Issues	Median Price %	Average Price %	Weighted Price %	Standard Deviation %
Senior Secured					
Investment Grade	89	50.50	54.50	56.39	24.42
Non-Investment Grade	283	33.50	36.63	31.91	26.04
Senior Unsecured					
Investment Grade	299	42.75	46.37*	44.05*	23.57
Non-Investment Grade	598	30.00	33.41	31.83	23.65
Senior Subordinated					
Investment Grade	11	27.31	39.54	42.04	24.23
Non-Investment Grade	411	26.50	31.48	28.99	24.30
Subordinated					
Investment Grade	12	35.69	35.64	23.55	23.83
Non-Investment Grade	238	28.00	30.91	28.66	21.98
Discount					
Investment Grade	--	--	--	--	---
Non-investment Grade	113	16.00	20.69	21.24	17.23
Total Sample	2,054	30.04	34.76	30.78	24.38

Notes: (*) Including WorldCom, the Average and Weighted Average were 43.53% and 30.45%
 Non-rated issues were considered as non-investment grade

Ultimate Recovery Rates on Bank Loan Defaults (Discounted Values, 1988-2004)

	1988 – 2Q 2004	Observations	4Q 1998 – 2Q 2002	Observations
Bank Debt	77.1%	1,023	74.5%	302
Senior Secured Bonds	63.3%	259	49.0%	40
Senior Unsecured Bonds	42.7%	587	32.8%	142
Senior Subordinated Bonds	31.2%	433	17.2%	100
Subordinated Bonds	30.1%	374	14.6%	43

Source: Keisman, 2004, from Standard & Poor's LossStats™ Database, 2084 defaulted loans and bond issues that defaulted between 1987-2004. Recoveries are discounted at each instruments' pre-default interest rate.

Recovery Rates for Telecommunications and E-Commerce Industries*

1998 – 2004

YEAR	NUMBER OF ISSUES	AVERAGE RECOVERY PRICE	WEIGHTED AVERAGE
1998	8	\$20.81	\$18.84
1999	16	\$23.47	\$25.58
2000	18	\$24.50	\$24.69
2001	118	\$18.69	\$16.07
2002	88	\$19.38	\$16.56
2003	26	\$40.31	\$38.03
2004	14	\$52.57	\$58.04
	<hr/> 288	<hr/> \$23.19	<hr/> \$21.39

* Includes Wireless Equipment and Satellite Telecommunication companies in addition to Telecommunication Service companies.

Source: Authors' compilation from Various Dealer Quotes.

Percentage Defaults by Year from Issuance

Time	2003		2004	
	# of Issues	Percentage	# of Issues	Percentage
1st Year	18	9%	8	10.39%
2nd Year	30	15%	7	9.09%
3rd Year	26	13%	8	10.39%
4th Year	23	11%	6	7.79%
5th Year	40	20%	10	12.99%
6th Year	20	10%	16	20.79%
7th Year	25	12%	9	11.69%
8th Year	3	1%	6	7.79%
9th Year	5	2%	1	1.30%
10th (+) Year	13	6%	6	7.79%
Total	203	100%	77	100%

Annual Returns

Yields and Spreads on 10-Year Treasury (Treas) and High Yield (HY) Bonds 1978- 2004

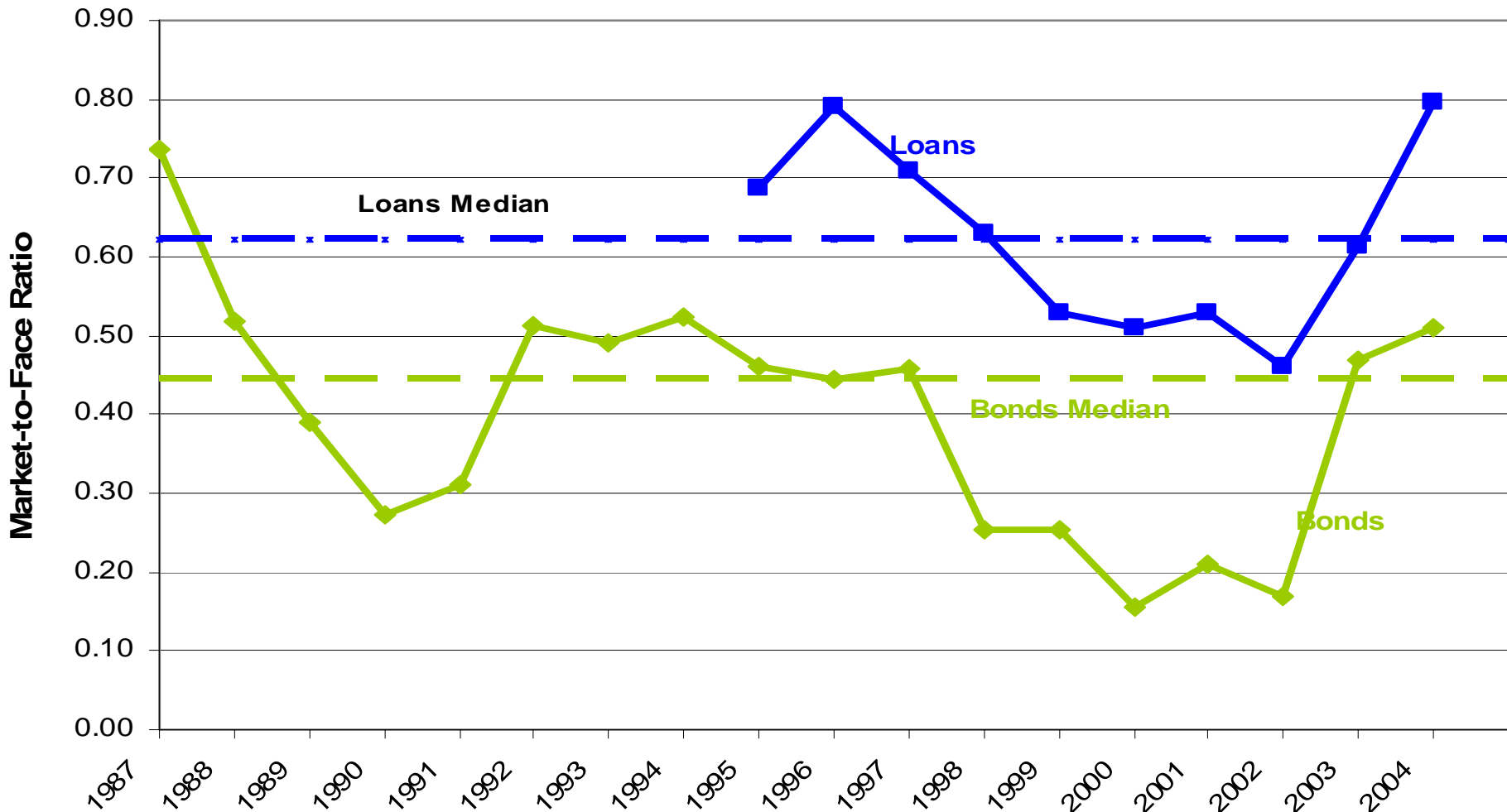
Year	Return (%)			Promised Yield (%) ^a		
	HY	Treas	Spread	HY	Treas	Spread
2004	10.79	4.87	5.92	7.35	4.21	3.14
2003	30.62	1.25	29.37	8.00	4.26	3.74
2002	(1.53)	14.66	(16.19)	12.38	3.82	8.56
2001	5.44	4.01	1.43	12.31	5.04	7.27
2000	(5.68)	14.45	(20.13)	14.56	5.12	9.44
1999	1.73	(8.41)	10.14	11.41	6.44	4.97
1998	4.04	12.77	(8.73)	10.04	4.65	5.39
1997	14.27	11.16	3.11	9.20	5.75	3.45
1996	11.24	0.04	11.20	9.58	6.42	3.16
1995	22.40	23.58	(1.18)	9.76	5.58	4.18
1994	(2.55)	(8.29)	5.74	11.50	7.83	3.67
1993	18.33	12.08	6.25	9.08	5.80	3.28
1992	18.29	6.50	11.79	10.44	6.69	3.75
1991	43.23	17.18	26.05	12.56	6.70	5.86
1990	(8.46)	6.88	(15.34)	18.57	8.07	10.50
1989	1.98	16.72	(14.74)	15.17	7.93	7.24
1988	15.25	6.34	8.91	13.70	9.15	4.55
1987	4.57	(2.67)	7.24	13.89	8.83	5.06
1986	16.50	24.08	(7.58)	12.67	7.21	5.46
1985	26.08	31.54	(5.46)	13.50	8.99	4.51
1984	8.50	14.82	(6.32)	14.97	11.87	3.10
1983	21.80	2.23	19.57	15.74	10.70	5.04
1982	32.45	42.08	(9.63)	17.84	13.86	3.98
1981	7.56	0.48	7.08	15.97	12.08	3.89
1980	(1.00)	(2.96)	1.96	13.46	10.23	3.23
1979	3.69	(0.86)	4.55	12.07	9.13	2.94
1978	7.57	(1.11)	8.68	10.92	8.11	2.81
Arithmetic Annual Average 1978-2004	11.37	9.02	2.36	12.47	7.57	4.90
Compound Annual Average 1978-2004	11.16	8.76	2.41			

^a End-of-year yields.

Source: Salomon Smith Barney and author's compilations

Defaulted Debt Indexes: Market-to-Face Value Ratios

(Annual 1986 - 2004)



Loans Median Market-to-Face value is 0.62 and Average Market-to-Face value is 0.63

Bonds Median Market-to-Face value is 0.45 and Average Market-to-Face value is 0.39

**ALTMAN-NYU SALOMON CENTER
DEFAULTED BOND INDEX**

**COMPARISON OF RETURNS
(1987 -2004)**

Year	Altman-NYU Salomon Center Defaulted Bond Index	S&P 500 Stock Index	Citigroup High Yield Loan Index
1987	37.85%	5.26%	3.63%
1988	26.49%	16.61%	13.47%
1989	-22.78%	31.68%	2.75%
1990	-17.08%	-3.12%	-7.04%
1991	43.11%	30.48%	39.93%
1992	15.39%	7.62%	17.86%
1993	27.91%	10.08%	17.36%
1994	6.66%	1.32%	-1.25%
1995	11.26%	37.56%	19.71%
1996	10.21%	22.96%	11.29%
1997	-1.58%	34.36%	13.18%
1998	-26.91%	28.58%	3.60%
1999	11.34%	20.98%	1.74%
2000	-33.09%	-9.11%	-5.68%
2001	17.47%	-11.87%	5.44%
2002	-5.98%	-22.08%	-1.53%
2003	84.87%	28.70%	30.62%
2004	18.93%	10.88%	10.79%
1987 - 2004 Arithmetic Average (Annual) Rate	11.34%	13.38%	9.77%
Standard Deviation	28.32%	17.51%	12.30%
1987 - 2004 Compounded Average (Annual) Rate	8.03%	12.03%	9.15%
1987 - 2004 Arithmetic Average (Monthly) Rate	0.74%	1.04%	0.76%
Standard Deviation	4.35%	4.49%	2.12%
1987 - 2004 Compounded Average (Monthly) Rate	0.60%	0.91%	0.73%

**ALTMAN-NYU SALOMON CENTER
DEFAULTED BANK LOAN INDEX**

**COMPARISON OF RETURNS
(1996 - 2004)**

Year	Altman-NYU Salomon Center Defaulted Bank Loan Index	S & P 500 Stock Index	Citigroup High Yield Bond Index
1996	19.56%	22.96%	11.29%
1997	1.75%	34.36%	13.18%
1998	-10.22%	28.58%	3.60%
1999	0.65%	20.98%	1.74%
2000	-6.59%	-9.11%	-5.68%
2001	13.94%	-11.87%	5.44%
2002	3.03%	-22.08%	-1.53%
2003	27.48%	28.70%	30.62%
2004	11.70%	10.88%	10.79%
1996 - 2004 Arithmetic Average (Annual) Rate	6.81%	11.49%	7.72%
Standard Deviation	12.31%	20.71%	10.60%
1996 - 2004 Compounded Average (Annual) Rate	6.19%	9.64%	7.28%
1996 - 2004 Arithmetic Average (Monthly) Rate	0.56%	0.88%	0.62%
Standard Deviation	2.76%	4.69%	2.36%
1996 - 2004 Compounded Average (Monthly) Rate	0.53%	0.71%	0.56%

CORRELATION OF ALTMAN-NYU SALOMON CENTER INDEXES OF DEFAULTED BONDS AND BANK LOANS WITH OTHER SECURITIES INDEXES 1987 - 2004

BOND INDEX CORRELATIONS - MONTHLY Correlation of Monthly Returns January 1987 - December 2004

	ALTMAN BOND INDEX	S&P 500	CITIGROUP HIGH-YIELD	10 YEAR T-BOND
ALTMAN BOND INDEX	100.00%	28.84%	61.35%	-19.07%
S&P 500		100.00%	50.13%	3.90%
CITIGROUP HIGH-YIELD			100.00%	10.61%
10 YEAR T-BOND				100.00%

LOAN INDEX CORRELATIONS - MONTHLY Correlation of Monthly Returns January 1996 - December 2004

	ALTMAN BOND INDEX	S&P 500	CITIGROUP HIGH-YIELD	10 YEAR T-BOND	ALTMAN BOND INDEX
ALTMAN LOAN INDEX	100.00%	-0.90%	44.69%	-19.64%	61.09%
S&P 500		100.00%	49.48%	-16.67%	24.18%
CITIGROUP HIGH-YIELD			100.00%	-6.49%	63.69%
10 YEAR T-BOND				100.00%	-25.57%
ALTMAN BOND INDEX					100.00%

Forecasting Defaults and the Default Rate

Marginal and Cumulative Mortality Rate Equation

$$\text{MMR}_{(t)} = \frac{\text{Total value of defaulting debt in year } (t)}{\text{total value of the population at the start of the year } (t)}$$

MMR = 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,

$$\text{CMR}_{(t)} = 1 - \prod_{t=1} SR_{(t)},$$

here $\text{CMR}_{(t)}$ = Cumulative Mortality Rate in (t) ,
 $\text{SR}_{(t)}$ = Survival Rate in (t) , $1 - \text{MMR}_{(t)}$

Mortality Rate Concept (Illustrative Calculation)

For BB Rated Issues

Security No.	Issued Amount	Year 1 Default	Call	SF	Year 2 Default	Call	SF
1	50	--	--	5	--	--	5
2	50	50	--	--	NE	NE	NE
3	100	--	100	--	NE	NE	NE
4	100	--	--	--	100	--	--
5	150	--	--	--	--	--	15
6	150	--	--	--	--	--	--
7	200	--	--	20	--	--	20
8	200	--	--	--	--	200	--
9	250	--	--	--	--	--	--
10	250	--	--	--	--	--	--
Total	1,500	50	100	25	100	200	40
Amount Start of Period	1,500	-	175	-	1,325	- 340	= 985
Marginal Mortality Rate		Year 1			Year 2		
		50/1,500 = 3.3%			100/1,325 = 7.5%		
Cumulative Rate		3.3%			1 - (SR1 x SR2) = CMR2 1 - (96.7% x 92.5%) = 10.55%		

NE = No longer in existence
SF = Sinking fund

Mortality Rates by Original Rating

All Rated Corporate Bonds^a 1971-2004

Years after issuance

		1	2	3	4	5	6	7	8	9	10
AAA	Marginal	0.00%	0.00%	0.00%	0.00%	0.03%	0.00%	0.00%	0.00%	0.00%	0.00%
	Cumulative	0.00%	0.00%	0.00%	0.00%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
AA	Marginal	0.00%	0.00%	0.32%	0.16%	0.03%	0.03%	0.00%	0.00%	0.03%	0.02%
	Cumulative	0.00%	0.00%	0.32%	0.48%	0.51%	0.54%	0.54%	0.59%	0.57%	0.59%
A	Marginal	0.01%	0.10%	0.02%	0.09%	0.06%	0.11%	0.06%	0.21%	0.11%	0.06%
	Cumulative	0.01%	0.11%	0.13%	0.22%	0.28%	0.39%	0.45%	0.65%	0.76%	0.82%
BBB	Marginal	0.36%	3.22%	1.43%	1.28%	0.77%	0.45%	0.20%	0.20%	0.14%	0.40%
	Cumulative	0.36%	3.56%	4.49%	6.16%	6.89%	7.31%	7.50%	7.68%	7.87%	8.18%
BB	Marginal	1.19%	2.48%	4.40%	2.01%	2.51%	1.16%	1.60%	0.88%	1.70%	3.60%
	Cumulative	1.19%	3.64%	7.88%	9.74%	12.00%	12.93%	14.36%	15.07%	16.52%	19.60%
B	Marginal	2.85%	6.85%	7.40%	8.55%	6.00%	4.16%	3.72%	2.28%	1.96%	0.86%
	Cumulative	2.85%	9.51%	16.20%	23.37%	27.94%	30.96%	33.46%	34.97%	36.25%	36.80%
CCC	Marginal	7.98%	15.57%	19.55%	12.10%	4.26%	9.45%	5.60%	3.15%	0.00%	4.28%
	Cumulative	7.98%	22.31%	37.50%	45.06%	47.37%	52.35%	55.01%	56.43%	56.43%	58.30%

(a) Rated by S&P at Issuance

Based on 1,796 issues

Source: Standard & Poor's (New York) and Author's Compilation

Mortality Losses by Original Rating

All Rated Corporate Bonds^a 1971-2004

Years after issuance

		1	2	3	4	5	6	7	8	9	10
AAA	Marginal	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Cumulative	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AA	Marginal	0.00%	0.00%	0.05%	0.05%	0.01%	0.01%	0.00%	0.00%	0.03%	0.02%
	Cumulative	0.00%	0.00%	0.05%	0.10%	0.11%	0.12%	0.12%	0.12%	0.15%	0.17%
A	Marginal	0.00%	0.03%	0.01%	0.04%	0.03%	0.06%	0.02%	0.04%	0.08%	0.00%
	Cumulative	0.00%	0.03%	0.04%	0.08%	0.11%	0.17%	0.19%	0.23%	0.31%	0.31%
BBB	Marginal	0.25%	2.25%	1.10%	0.77%	0.46%	0.27%	0.10%	0.11%	0.07%	0.24%
	Cumulative	0.25%	2.49%	3.57%	4.31%	4.75%	5.00%	5.10%	5.21%	5.27%	5.50%
BB	Marginal	0.69%	1.44%	2.55%	1.16%	1.46%	0.60%	0.90%	0.38%	0.84%	1.28%
	Cumulative	0.69%	2.13%	4.62%	5.72%	7.10%	7.66%	8.48%	9.83%	9.60%	10.76%
B	Marginal	1.83%	4.75%	5.18%	5.72%	4.06%	2.41%	2.54%	1.34%	1.02%	0.64%
	Cumulative	1.83%	6.50%	11.34%	14.41%	19.80%	21.73%	23.72%	24.75%	25.51%	25.99%
CCC	Marginal	5.33%	11.68%	14.67%	9.32%	3.10%	7.28%	4.31%	2.52%	0.00%	3.22%
	Cumulative	5.33%	16.39%	28.65%	35.31%	37.31%	41.88%	44.38%	45.78%	45.78%	47.53%

(a) Rated by S&P at Issuance

Based on 1,604 issues

Source: Standard & Poor's (New York) and Author's Compilation

Cumulative Default Rate Comparison (in % for up to 10 years)

	1	2	3	4	5	6	7	8	9	10
AAA/Aaa										
Altman	0.00	0.00	0.00	0.00	0.03	0.03	0.03	0.03	0.03	0.03
Moody's	0.00	0.00	0.00	0.04	0.12	0.21	0.30	0.41	0.52	0.63
S&P	0.00	0.00	0.03	0.06	0.10	0.17	0.24	0.36	0.41	0.45
AA/Aa										
Altman	0.00	0.00	0.32	0.48	0.51	0.54	0.54	0.59	0.57	0.59
Moody's	0.00	0.00	0.03	0.12	0.20	0.29	0.37	0.47	0.54	0.61
S&P	0.01	0.04	0.09	0.19	0.30	0.41	0.54	0.64	0.74	0.85
A/A										
Altman	0.01	0.11	0.13	0.22	0.28	0.39	0.45	0.65	0.76	0.82
Moody's	0.02	0.08	0.22	0.36	0.50	0.67	0.85	1.04	1.25	1.48
S&P	0.04	0.13	0.24	0.40	0.61	0.84	1.11	1.34	1.63	1.94
BBB/Baa										
Altman	0.36	3.56	4.49	6.16	6.89	7.31	7.50	7.68	7.87	8.18
Moody's	0.19	0.54	0.98	1.55	2.08	2.59	3.12	3.65	4.25	4.89
S&P	0.29	0.81	1.40	2.19	2.99	3.73	4.34	4.95	5.50	6.10
BB/Ba										
Altman	1.19	3.64	7.88	9.74	12.00	12.93	14.36	15.07	16.52	19.60
Moody's	1.22	3.34	5.79	8.27	10.72	12.98	14.81	16.64	18.40	20.11
S&P	1.20	3.58	6.39	8.97	11.25	13.47	15.25	16.75	18.16	19.20
B/B										
Altman	2.85	9.51	16.20	23.37	27.94	30.96	33.46	34.97	36.25	36.80
Moody's	5.81	12.93	19.51	25.33	30.48	35.10	39.45	42.89	45.89	48.64
S&P	5.71	12.49	18.09	22.37	25.40	27.77	29.76	31.32	32.54	33.75
CCC/Caa										
Altman	7.98	22.31	37.50	45.06	47.37	52.35	55.01	56.43	56.43	58.30
Moody's	22.43	35.96	46.71	54.19	59.72	64.49	68.06	71.91	74.53	76.77
S&P	28.83	37.97	43.52	47.44	50.85	52.13	53.39	54.05	55.56	56.45

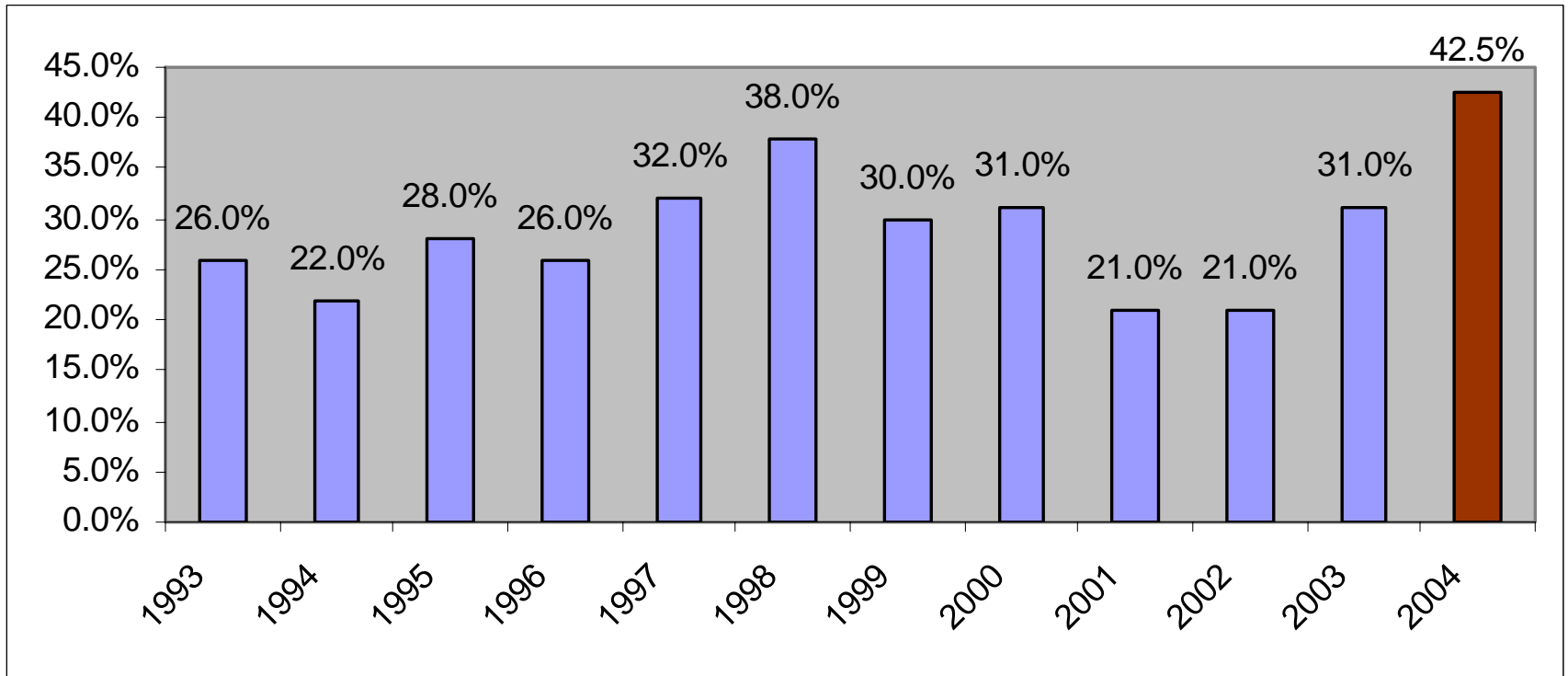
Source: Altman, Market value weights, by numbered years from original Standard & Poor's issuances, 1971-2004, based on actual ratings (Altman and Aguiar, 2005).

Moody's, Issuer weighted, cohort analysis, 1971-2004, based on actual or implied senior unsecured ratings (Moody's Investors Service, 2005).

S&P, Issuer weighted, static-pool analysis, 1981-2004, based on actual or implied senior unsecured ratings (Standard & Poor's, 2005).

New Issues

New Issues Rated B- or Below



Source: Standard & Poor's

Forecasted High Yield Market Size*, Defaults and Default Rates for 2005 and 2006

	High Yield Market* (\$ Billion)	Default Rate (%)	Default Amount (\$ Billion)
2005	\$1,010.0	3.00%	\$30.30
2006	\$1,080.0	4.10%	\$44.30

* Assumes GM not Downgraded