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# Current Conditions in Global Credit Markets

Are historically based default and recovery models in the high yield and distressed debt markets still relevant in today's credit environment?

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# Major Agencies Bond Rating Categories

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<u>Moody's</u>		<u>S&amp;P/Fitch</u>
Aaa	↑ Investment Grade ↓ High Yield ("Junk")	AAA
Aa1		AA+
Aa2		AA
Aa3		AA-
A1		A+
A2		A
A3		A-
Baa1		BBB+
Baa2		BBB
Baa3		BBB-
Ba1	BB+	
Ba2	BB	
Ba3	BB-	
B1	B+	
B2	B	
B3	B-	
Caa1	CCC+	
Caa	CCC	
Caa3	CCC-	
Ca	CC	
C	C	
	D	

# **Changes in the Credit Environment: Are Historical Default and Recovery Estimates Still Relevant?**

## **Default and Recovery Forecasting Models**

- Macro-Economic Models: Default Probabilities
- Mortality Rate Models: Default Probabilities
- Recovery Rate Models: Loss-Given-Default
- Distressed Debt Market Size Estimate

# Factors Affecting the Transformation of Credit Markets in Last Few Years

- Massive Global Liquidity
  - Petrodollars, Foreign Governments, Financial Institutions, Global Money Supply Expansion, etc.
- Explosion of Hedge Fund Activity
- Frenetic Activity in M&A/LBO transactions
- Growth of the Institutional Loan Market, esp. Leveraged Loans
- Easy Credit Standards by both Bank and Non-Bank Lenders
- Record Low Required Yield Spreads in a Higher Credit Risk Profile Environment

# Factors Affecting the Transformation of Credit Markets in Last Few Years

- Rapid Growth in Derivatives and Synthetics, esp. CDOs
- Historically Low Default Rates and High Recoveries
- Extremely Low Equity and Debt Volatility
- Globalization of Information and Technology
- Escalating Leverage Throughout the Credit Markets in Search of Alpha

# **Are Historical Default and Recovery Estimates Still Relevant?**

## **Increased Creditor Influences and Lower Default Rates**

- Rescue Financing Restructurings
- Pre-Petition Credit Facilities
- Distressed Debt Control Investing
- DIP Financings, Exit Financing

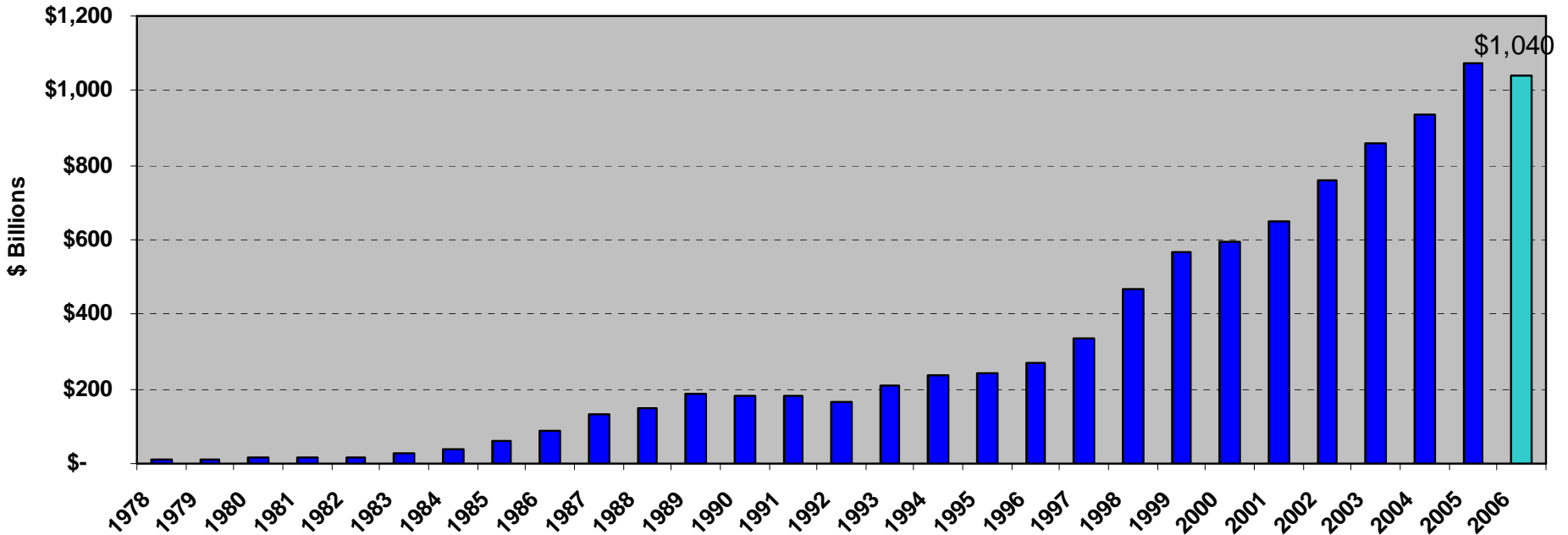
# **Changes in the Credit Environment: Are Historical Default and Recovery Estimates Still Relevant?**

## **The New Bankruptcy Code of 2005**

- Increased Creditor Rights
- Reduced Management Flexibility
- Greater Role of Turnaround Managers

# Size of the US High-Yield Bond Market

1978 – 2006 (Mid-year US\$ billions)





# Historical Default Rates

Straight Bonds Only Excluding Defaulted Issues From Par Value Outstanding, 1971 – 2006  
(US\$ millions)

Year	Par Value Outstanding <sup>a</sup>	Par Value Defaults	Default Rates (%)	Year	Par Value Outstanding <sup>a</sup>	Par Value Defaults	Default Rates (%)
<b>2006</b>	<b>\$993,600</b>	<b>\$7,559</b>	<b>0.761</b>	1981	\$17,115	\$27	0.158
2005	\$1,073,000	\$36,181	3.372	1980	\$14,935	\$224	1.500
<b>2004</b>	<b>\$933,100</b>	<b>\$11,657</b>	<b>1.249</b>	1979	\$10,356	\$20	0.193
2003	\$856,000	\$38,451	4.661	1978	\$8,946	\$119	1.330
2002	\$757,000	\$96,855	12.795	1977	\$8,157	\$381	4.671
2001	\$649,000	\$63,609	9.801	1976	\$7,735	\$30	0.388
2000	\$597,200	\$30,295	5.073	1975	\$7,471	\$204	2.731
1999	\$567,400	\$23,532	4.147	1974	\$10,894	\$123	1.129
1998	\$465,500	\$7,464	1.603	1973	\$7,824	\$49	0.626
1997	\$335,400	\$4,200	1.252	1972	\$6,928	\$193	2.786
1996	\$271,000	\$3,336	1.231	1971	\$6,602	\$82	1.242
1995	\$240,000	\$4,551	1.896				
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				

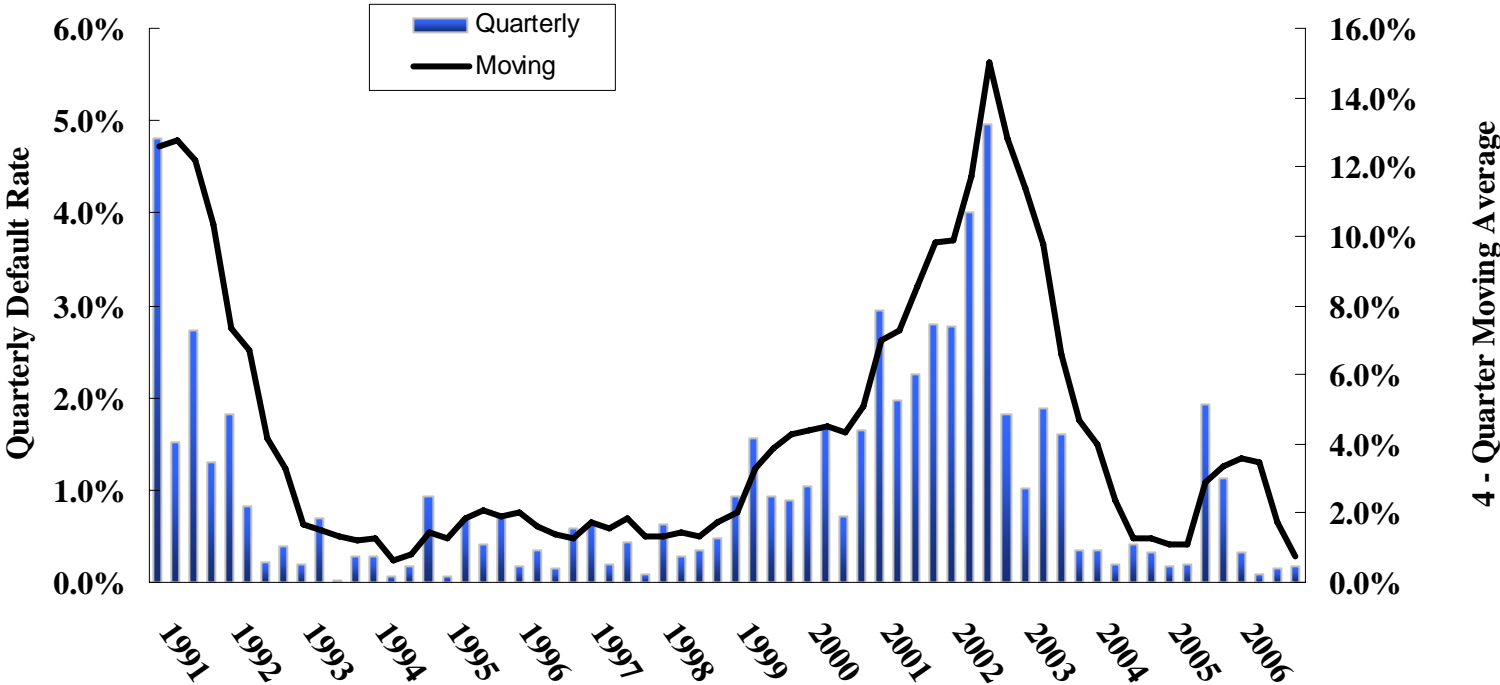
  

		Standard Deviation (%)
<b>Arithmetic Average Default Rate</b>		
1971 to 2006	3.167%	3.072%
1978 to 2006	3.464%	3.283%
1985 to 2006	4.189%	3.428%
<b>Weighted Average Default Rate<sup>b</sup></b>		
1971 to 2006	4.244%	
1978 to 2006	4.258%	
1985 to 2006	4.303%	
<b>Median Annual Default Rate</b>		
1971 to 2006	1.802%	

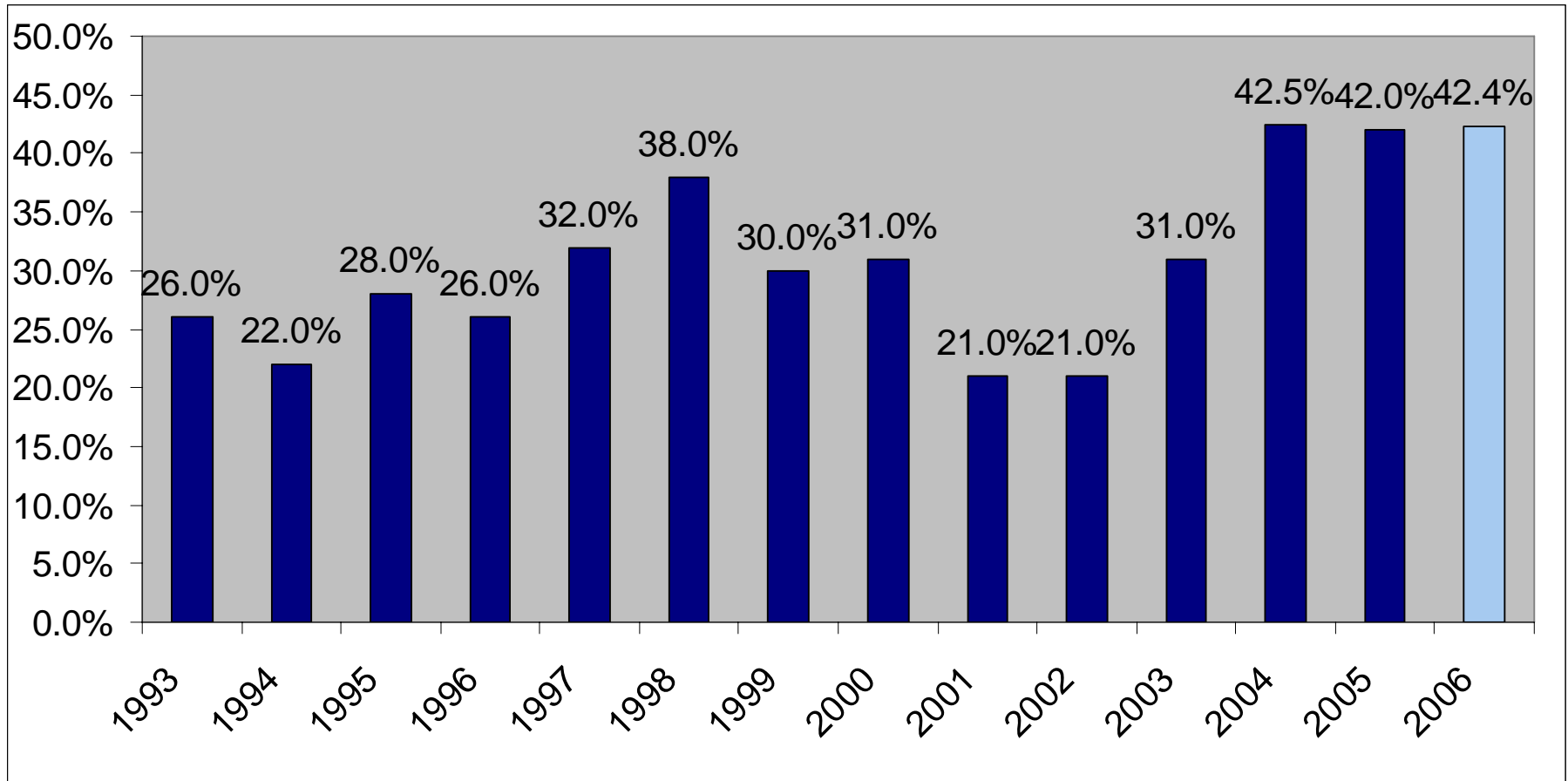
<sup>b</sup> Weighted by par value of amount outstanding for each year.

# Historical Default Rates

QUARTERLY DEFAULT RATE AND FOUR QUARTER MOVING AVERAGE  
1991 - 2006



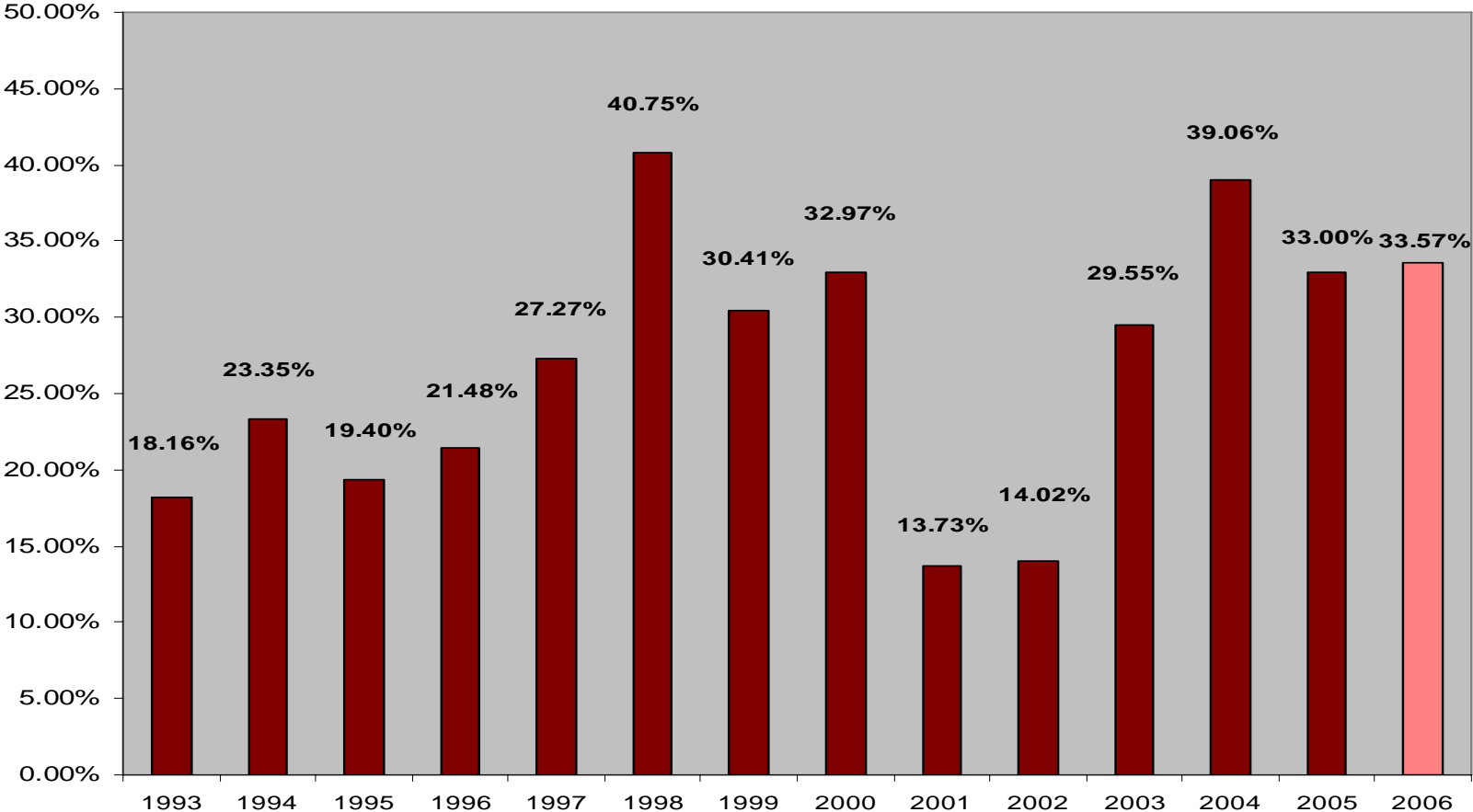
# New Issues Rated B- or Below as Percentage of all New Issues (1993 – 2006)



Source: Standard & Poor's

# Percentage of New High-Yield Issues Rated B- or Below Based on Amount of Issuance

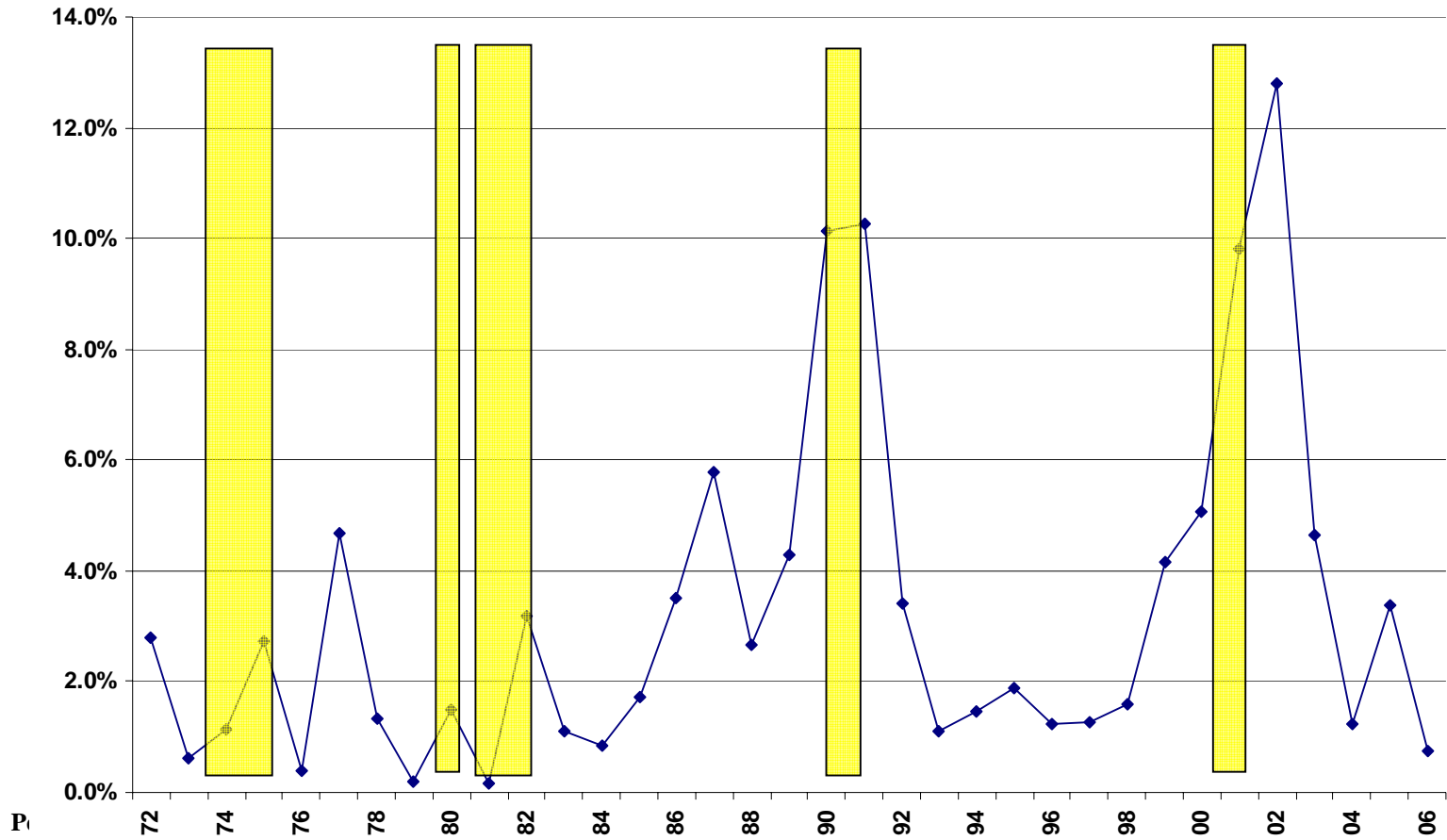
(1993 - 2006)



Source: Standard & Poor's

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

## HIGH YIELD BOND MARKET 1972 – 2006

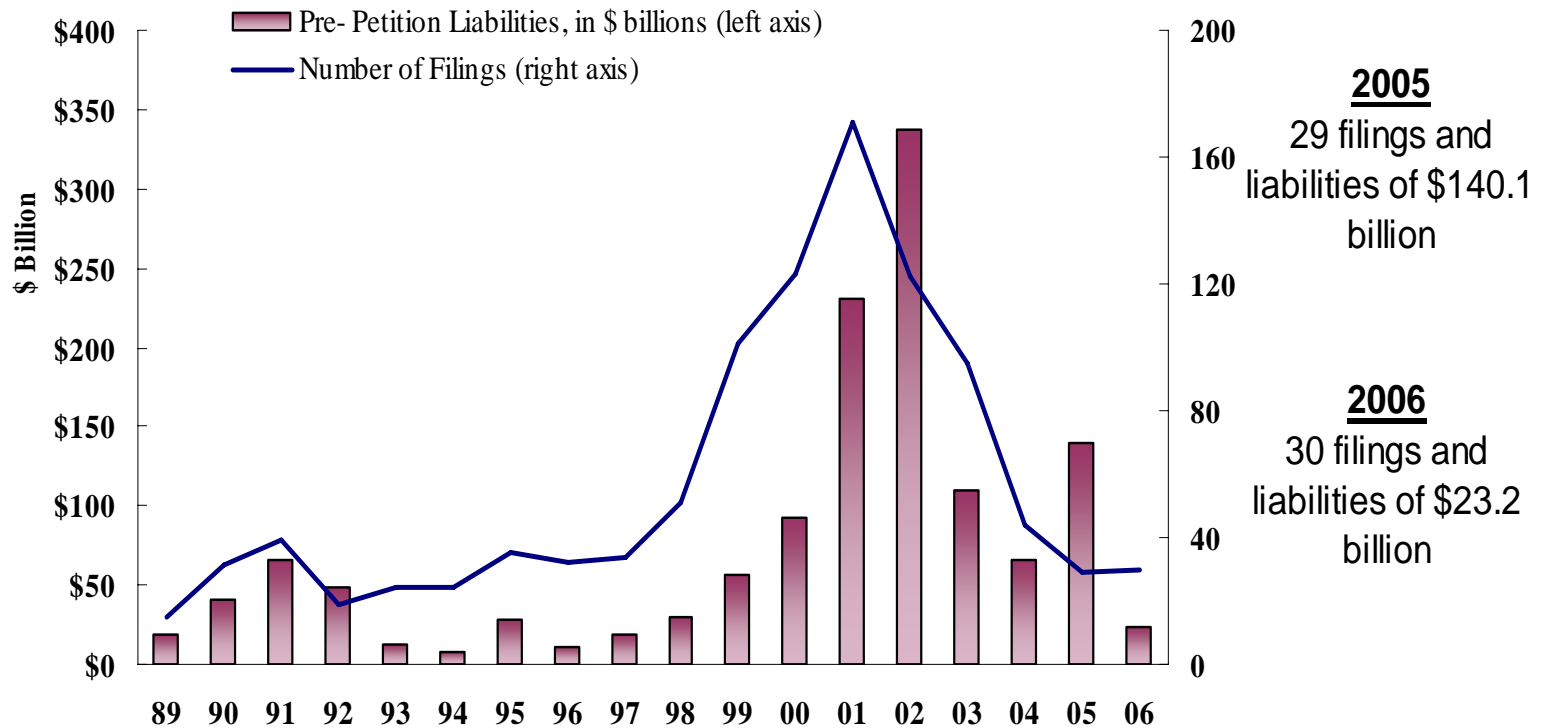


Source: E. Altman (NYU Salomon Center) & National Bureau of Economic Research

# Filings for Chapter 11

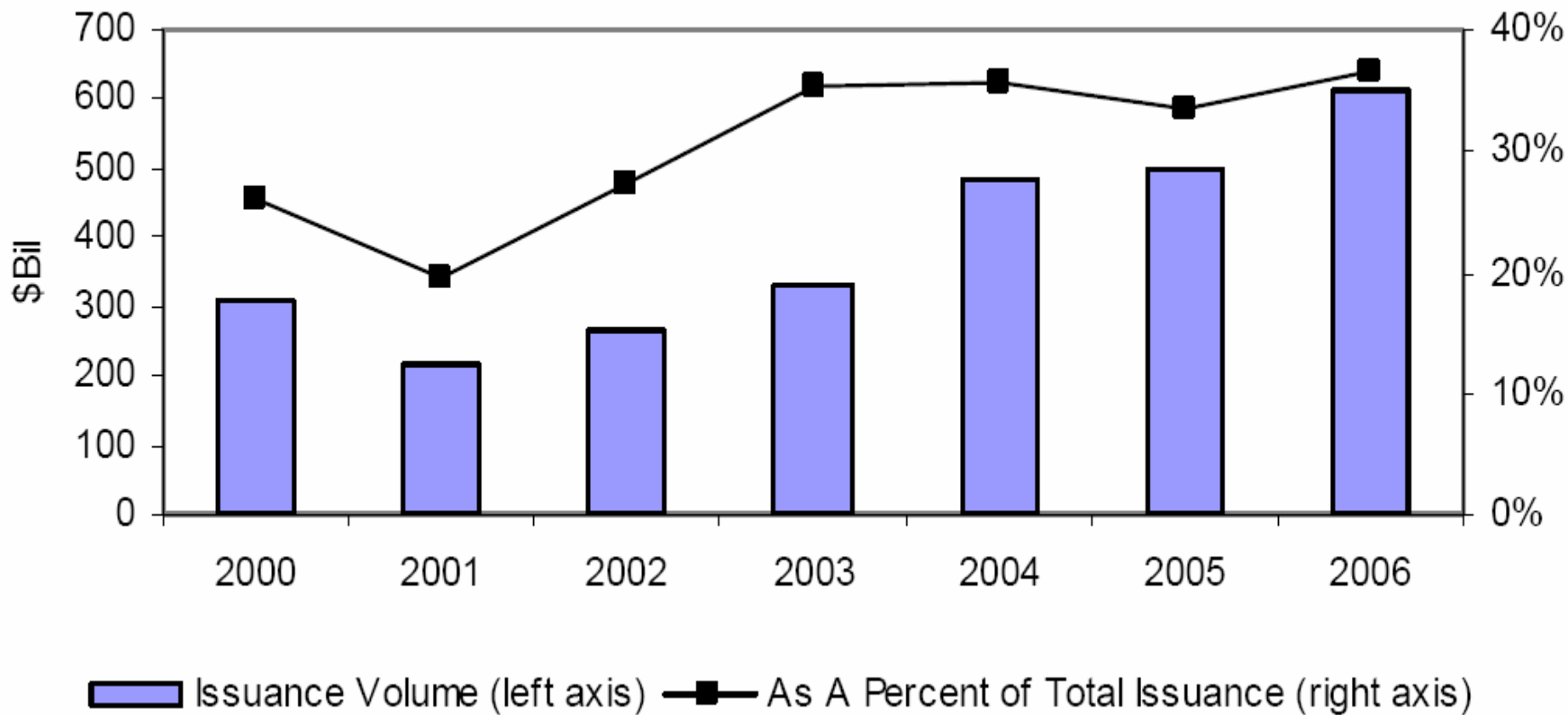
Number of Filings and Pre-petition Liabilities of Public Companies

1989 – 2006



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

## Leveraged Loan Market U.S. Distressed Market Update

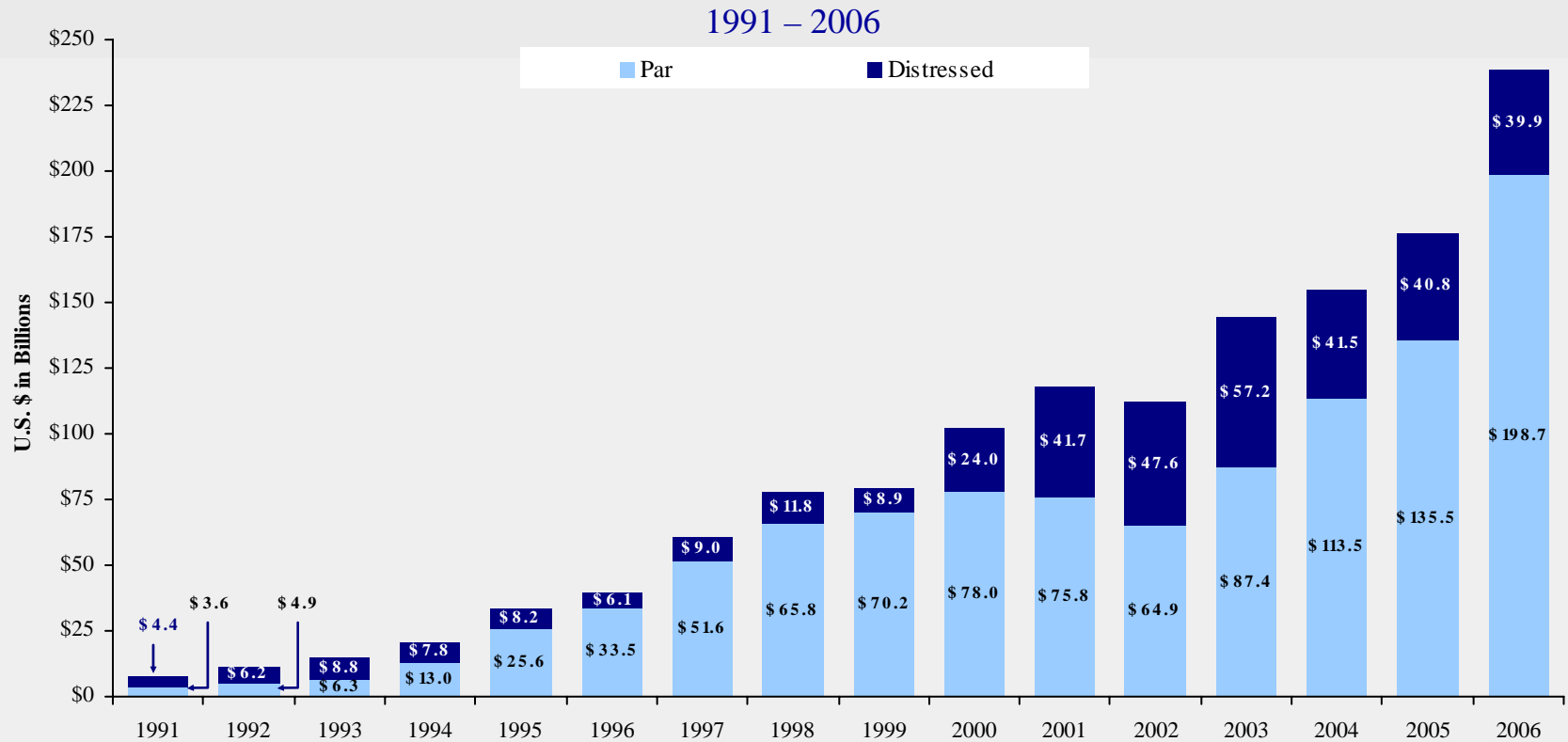


Source: Fitch, Reuters/LPC

# Leveraged Loan Market

## U.S. Distressed Market Update

### The U.S. Secondary Loan Market Volume<sup>(a)</sup>



(a) Represents single-sided secondary trading volume subdivided into par and distressed volume.

Source: Reuters, Loan Pricing Corporation

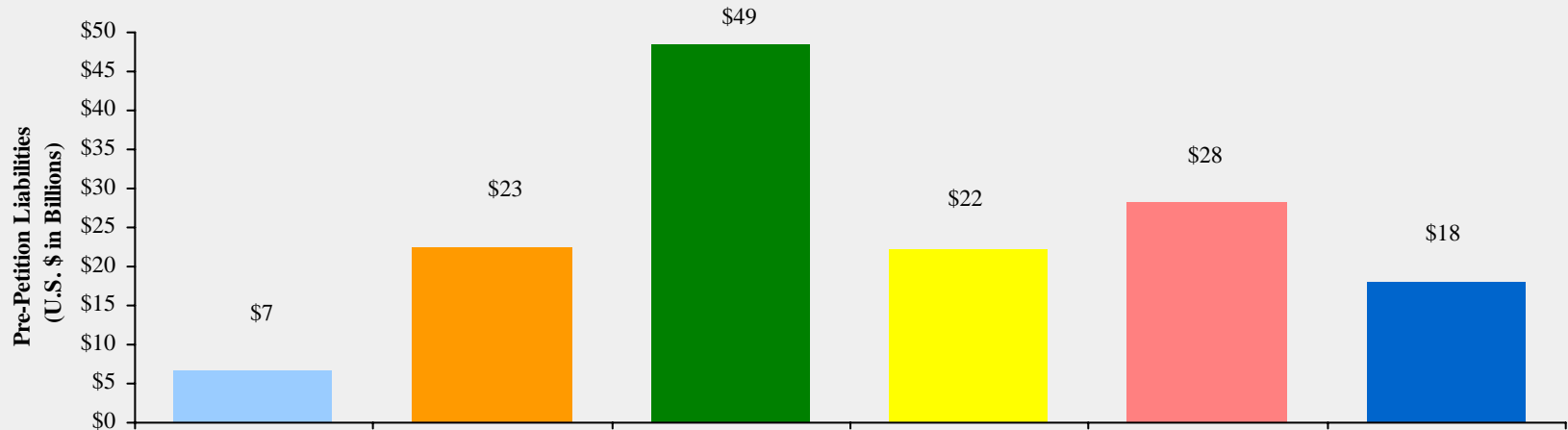
- U.S. secondary bank loan market activity continues to grow



# Recent Large Bankruptcies

## U.S. Distressed Market

### Recent Large Bankruptcies



<b>Company:</b>	<b>Dana Corp.</b>	<b>Calpine</b>	<b>Refco</b>	<b>Delphi Corp.</b>	<b>Delta Airlines</b>	<b>Northwest Airlines</b>
<b>Date Filed:</b>	3/6/06	12/20/05	10/17/05	10/8/05	9/14/05	9/14/05
<b>Industry:</b>	Auto Parts	Energy	Finance	Auto Parts	Airlines	Airlines

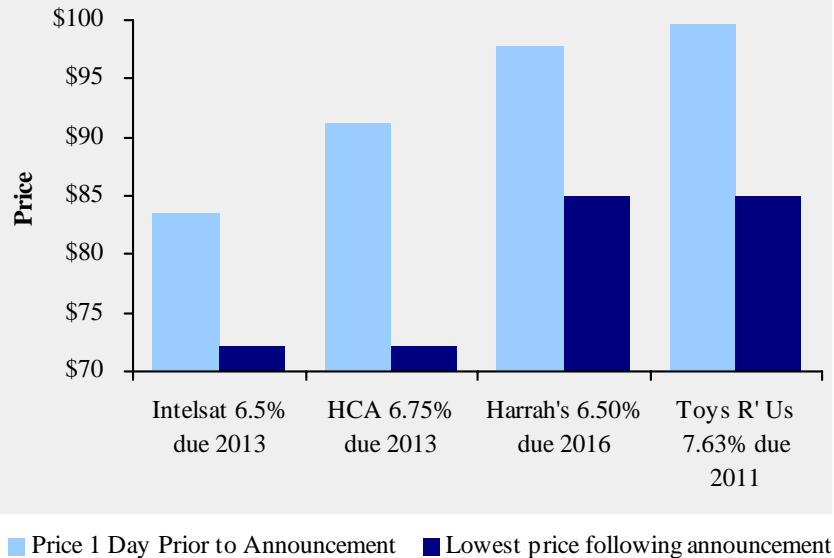
# LBO Market Overview

## The Current Environment

### Bond Performance – Before and After LBO announcement

#### Completed and Proposed LBOs

1997 – 2/1/07

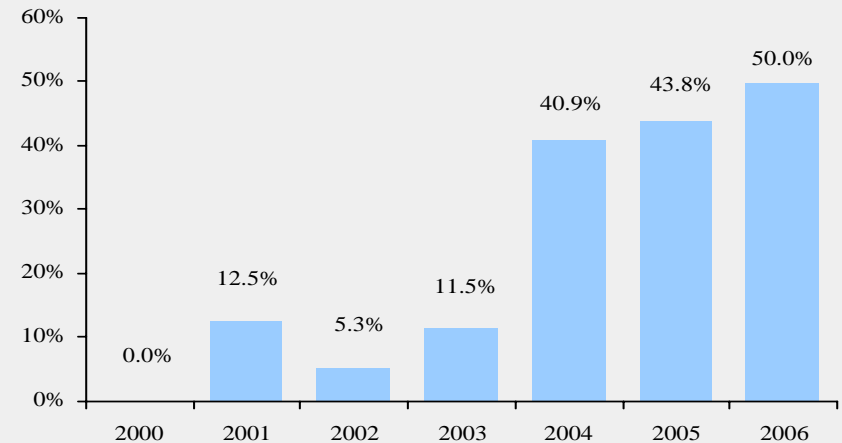


Source: Bloomberg LLC

### LBOs Are More Highly Leveraged

#### % of Acquisition Financing Rated CCC

2000 – 12/31/06





Source: J.P. Morgan

- Financial sponsors have taken advantage of “covenant-light” unsecured debt in recent transactions
- Acquisition financing is more aggressive than it has been in several years

# Private Equity Fundraising and Leverage Buyout Activity is Abundant U.S. Distressed Market

## Selected Recent Completed & Announced Large LBOs (as of January 20, 2007)

Company	Transaction Size U.S. \$ in Millions	Timing	Company	Transaction Size U.S. \$ in Millions	Timing	Company	Transaction Size U.S. \$ in Millions	Timing
	\$12,960	Completed		\$33,200	Completed		\$21,800	Proposed
	\$5,480	Completed		\$8,300	Completed		\$25,300	Proposed
	\$4,300	Completed		\$6,000	Completed		\$32,500	Proposed
	\$4,000	Completed		\$4,100	Completed		\$26,700	Proposed
	\$3,400	Completed		\$3,400	Completed		\$19,152	Proposed
	\$3,000	Completed		\$17,400	Completed		\$11,104	Proposed
	\$10,600	Completed		\$13,600	Proposed		\$10,874	Proposed
	\$6,400	Completed		\$3,150	Proposed			

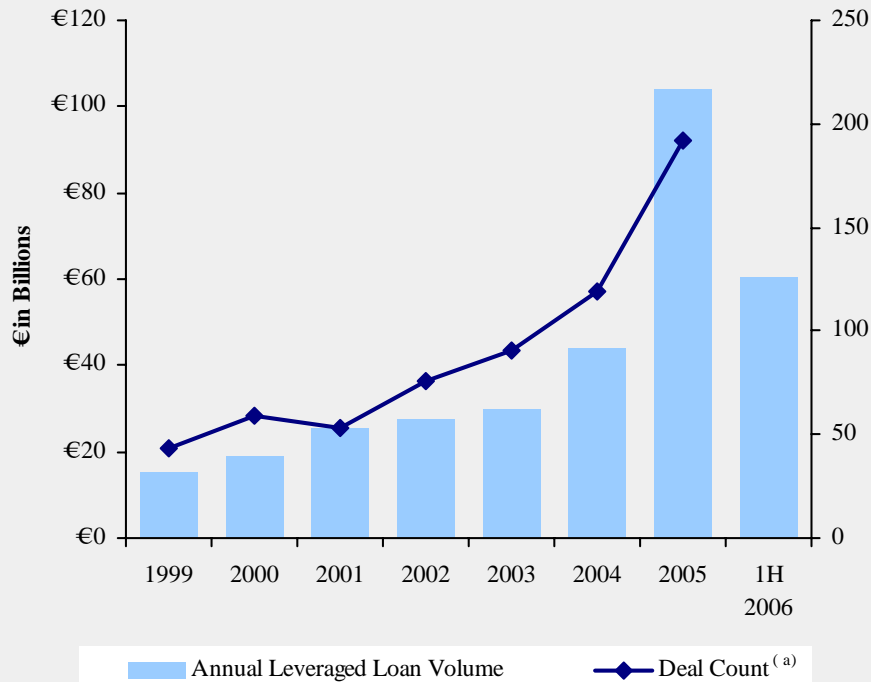
Source: Standard and Poor's LCD and Avenue estimates

- Many of today's LBOs are highly leveraged, large capitalization companies that may provide a pipeline of scalable investment opportunities

# Leveraged Buy-Outs Fueling Loan Growth

## Current European Environment

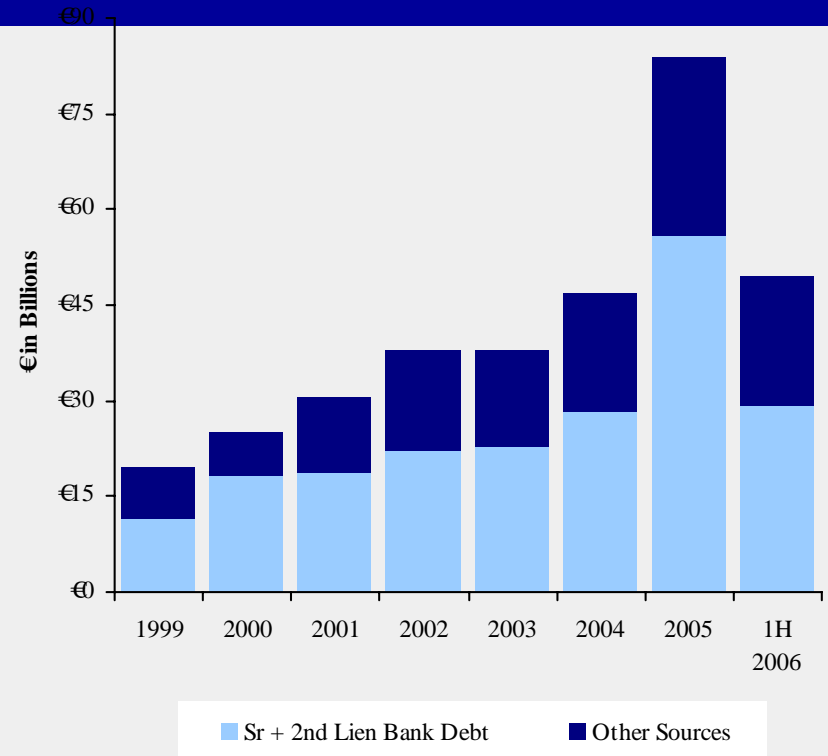
### LBO Transaction Volume



(a) Deal Count counts First and Second Lien portions of a single transaction as one event; Deal Count also excludes any amendments.

Source: Standard & Poor's

### Annual Leveraged Loan Volume



Source: Standard & Poor's

- Leveraged buy-outs continue to grow in size and number
- Leveraged loan volume continues to grow correspondingly

## Leverage Continues to Increase Current European Environment

### Leverage Multiples for European LBOs



Source: Standard & Poor's LCD; Thomson Datastream

- In 2002 the average leverage multiple on European LBOs was 4.2x earnings
- By June 2006, average leverage multiples were 5.4, and in the third quarter, leverage multiples on European LBOs were expected to approach 6.0x earnings

# 2006 Default Loss Rate

	Unadjusted for Fallen Angels	Only Fallen Angels	All except Fallen Angels	Price Adjusted for Fallen Angels
<b><i>BACKGROUND DATA</i></b>				
AVERAGE DEFAULT RATE	0.761%	1.402%	0.671%	0.836%
AVERAGE PRICE AT DEFAULT (a)	65.322%	66.305%	65.023%	65.312%
AVERAGE PRICE AT DOWNGRADE (a)		95.000%		
AVERAGE RECOVERY	65.322%	69.795%	65.023%	66.100%
AVERAGE LOSS OF PRINCIPAL	34.678%	30.205%	34.977%	33.900%
AVERAGE COUPON PAYMENT	9.330%	6.388%	10.103%	9.265%
<b><i>DEFAULT LOSS COMPUTATION</i></b>				
DEFAULT RATE	0.761%	1.402%	0.671%	0.836%
X LOSS OF PRINCIPAL	34.678%	30.205%	34.977%	33.900%
DEFAULT LOSS OF PRINCIPAL	0.264%	0.423%	0.235%	0.283%
DEFAULT RATE	0.761%	1.402%	0.671%	0.836%
X LOSS OF 1/2 COUPON	4.665%	3.194%	5.052%	4.632%
DEFAULT LOSS OF COUPON	0.035%	0.045%	0.034%	0.039%
<b>DEFAULT LOSS OF PRINCIPAL AND COUPON</b>	<b>0.299%</b>	<b>0.468%</b>	<b>0.269%</b>	<b>0.322%</b>

(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<sup>a</sup>

1978 – 2006

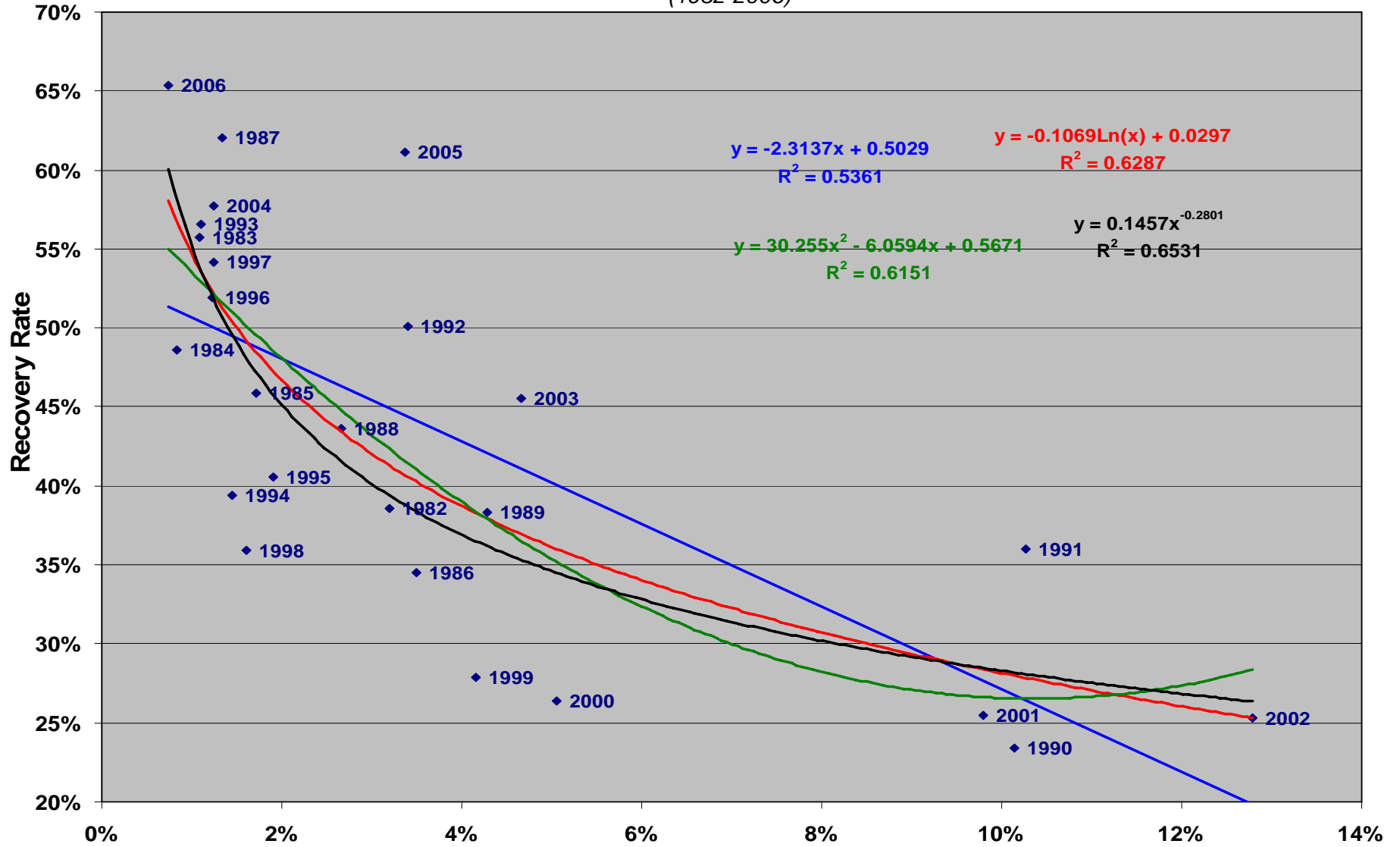
Year	Par Value Outstanding <sup>a</sup> (\$MM)	Par Value Of Default (\$MMs)	Default Rate (%)	Weighted Price After Default	Weighted Coupon (%)	Default Loss (%)
<b>2006</b>	<b>\$993,600</b>	<b>\$7,559</b>	<b>0.76</b>	<b>\$65.3</b>	<b>9.33</b>	<b>0.30</b>
<b>2005</b>	<b>\$1,073,000</b>	<b>\$36,181</b>	<b>3.37</b>	<b>\$61.1</b>	<b>8.61</b>	<b>1.46</b>
<b>2004</b>	<b>\$933,100</b>	<b>\$11,657</b>	<b>1.25</b>	<b>\$57.7</b>	<b>10.30</b>	<b>0.61</b>
2003	\$825,000	\$ 38,451	4.66	<b>\$45.5</b>	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 1978-2006:			3.46	\$44.1	10.84	2.34
Weighted Average 1978-2006:			4.26			2.94

<sup>a</sup> Excludes defaulted issues.

Source: Authors' compilations and various dealer price quotes.

# Recovery Rate/Default Rate Association

Dollar Weighted Average Recovery Rates to Dollar Weighted Average Default Rates  
(1982-2006)





**WEIGHTED AVERAGE (BY ISSUE) RECOVERY RATES ON DEFAULTED DEBT  
BY SENIORITY PER \$100 FACE AMOUNT (1978 - 2006)**

Default Year	Senior Secured			Senior Unsecured			Senior Subordinated			Subordinated			Discount and Zero Coupon			All Seniorities	
	No.	%	\$	No.	%	\$	No.	%	\$	No.	%	\$	No.	%	\$	No.	\$
2006	9	18%	\$90.60	26	52%	\$60.90	8	16%	\$50.24	1	2%	\$60.33	6	12%	\$78.31	50	\$65.32
2005	67	54%	\$76.50	44	36%	\$45.88	7	6%	\$32.67	0	0%	\$0.00	5	4%	\$74.21	123	\$61.10
2004	27	39%	\$63.67	33	48%	\$56.77	2	3%	\$37.44	0	0%	\$0.00	7	10%	\$43.06	69	\$57.72
2003	57	28%	\$53.51	108	53%	\$45.40	29	14%	\$35.98	1	0%	\$38.00	8	4%	\$32.27	203	\$45.58
2002	37	11%	\$52.81	254	75%	\$21.82	21	6%	\$32.79	0	0%	\$0.00	28	8%	\$26.47	340	\$25.30
2001	9	3%	\$40.95	187	67%	\$28.84	48	17%	\$18.37	0	0%	\$0.00	37	13%	\$15.05	281	\$25.62
2000	13	8%	\$39.58	47	29%	\$25.40	61	37%	\$25.96	26	16%	\$26.62	17	10%	\$23.61	164	\$26.74
1999	14	11%	\$26.90	60	47%	\$42.54	40	31%	\$23.56	2	2%	\$13.88	11	9%	\$17.30	127	\$27.90
1998	6	18%	\$70.38	21	62%	\$39.57	6	18%	\$17.54	0	0%	0.00	1	3%	\$17.00	34	\$40.46
1997	4	16%	\$74.90	12	48%	\$70.94	6	24%	\$31.89	1	4%	\$60.00	2	8%	\$19.00	25	\$57.61
1996	4	17%	\$59.08	4	17%	\$50.11	9	38%	\$48.99	4	17%	\$44.23	3	13%	\$11.99	24	\$45.44
1995	5	15%	\$44.64	9	27%	\$50.50	17	52%	\$39.01	1	3%	\$20.00	1	3%	\$17.50	33	\$41.77
1994	5	23%	\$48.66	8	36%	\$51.14	5	23%	\$19.81	3	14%	\$37.04	1	5%	\$5.00	22	\$39.44
1993	2	6%	\$55.75	7	22%	\$33.38	10	31%	\$51.50	9	28%	\$28.38	4	13%	\$31.75	32	\$38.83
1992	15	22%	\$59.85	8	12%	\$35.61	17	25%	\$58.20	22	33%	\$49.13	5	7%	\$19.82	67	\$50.03
1991	4	3%	\$44.12	69	44%	\$55.84	37	24%	\$31.91	38	24%	\$24.30	9	6%	\$27.89	157	\$40.67
1990	12	10%	\$32.18	31	27%	\$29.02	38	33%	\$25.01	24	21%	\$18.83	11	9%	\$15.63	116	\$24.66
1989	9	12%	\$82.69	16	21%	\$53.70	21	28%	\$19.60	30	39%	\$23.95				76	\$35.97
1988	13	21%	\$67.96	19	31%	\$41.99	10	16%	\$30.70	20	32%	\$35.27				62	\$43.45
1987	4	13%	\$90.68	17	55%	\$72.02	6	19%	\$56.24	4	13%	\$35.25				31	\$66.63
1986	8	14%	\$48.32	11	20%	\$37.72	7	13%	\$35.20	30	54%	\$33.39				56	\$36.60
1985	2	7%	\$74.25	3	11%	\$34.81	7	26%	\$36.18	15	56%	\$41.45				27	\$41.78
1984	4	29%	\$53.42	1	7%	\$50.50	2	14%	\$65.88	7	50%	\$44.68				14	\$50.62
1983	1	13%	\$71.00	3	38%	\$67.72				4	50%	\$41.79				8	\$55.17
1982				16	80%	\$39.31				4	20%	\$32.91				20	\$38.03
1981	1	100%	\$72.00													1	\$72.00
1980				2	50%	\$26.71				2	50%	\$16.63				4	\$21.67
1979										1	100%	\$31.00				1	\$31.00
1978				1	100%	\$60.00										1	\$60.00
Total/Average	332	15%	\$59.65	1017	47%	\$36.85	414	19%	\$30.60	249	11%	\$31.17	156	7%	\$25.98	2,168	\$37.16
Median			\$59.08			\$45.40			\$32.79			\$31.00			\$19.82		\$41.77
Standard Dev			\$17.20			\$13.97			\$13.59			\$17.77					

# Annual Returns

## Yields and Spreads on 10-Year Treasury (Treas) and High Yield (HY) Bonds 1978 - 2006

Year	Return (%)			Promised Yield (%) <sup>a</sup>		
	HY	Treas	Spread	HY	Treas	Spread
2006	11.85	1.37	10.47	7.82	4.70	3.11
2005	2.08	2.04	0.04	8.44	4.39	4.05
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
<b>Arithmetic Annual Average</b> 1978-2006	11.07	8.51	2.56	12.17	7.36	4.80
<b>Compound Annual Average</b> 1978-2006	10.46	7.94	2.51			

<sup>a</sup> End-of-year yields.

Source: Salomon Smith Barney and author's compilations

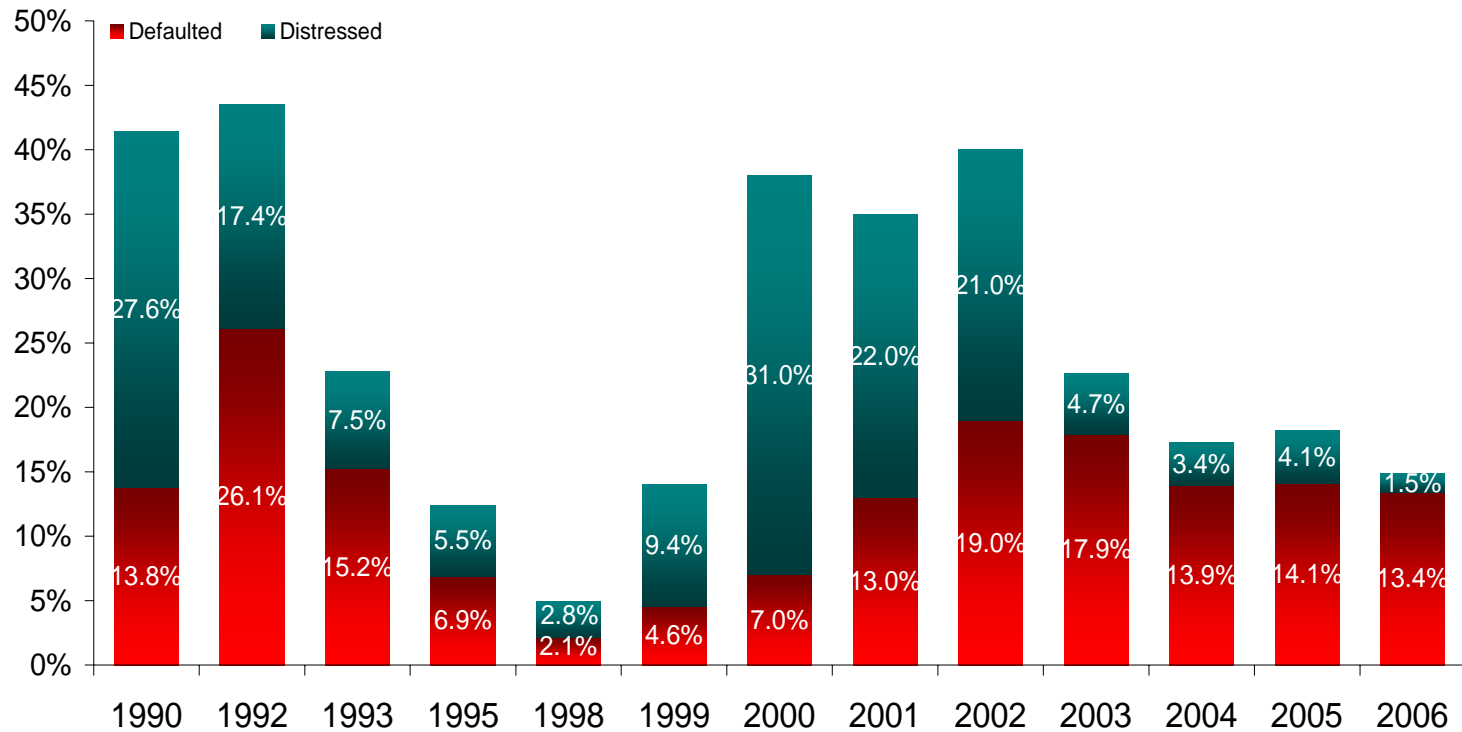
Asset Class Returns (%) 2003 - 2006

	2003	2004	2005	2006
<b>U.S. Bond Market Returns:</b>				
Investment Grade	8.31	5.42	1.97	4.38
BBB	11.52	6.21	0.99	4.56
Fallen Angels	34.67	11.48	2.68	15.23
High Yield	30.62	10.79	2.08	11.85
BB	19.45	9.33	3.11	9.90
B	26.01	10.44	3.74	11.43
CCC	60.99	15.75	-0.54	18.63
High Yield Distressed	78.71	24.78	-15.95	42.80
Defaulted Bond & Loans	49.30	15.40	1.84	23.40
Leveraged Loans	9.97	5.17	5.08	6.77
US 10-Year Treasury	1.32	4.83	1.99	1.36
Agency Bonds	2.63	3.29	2.27	4.39
Municipal Bonds	6.18	5.45	3.94	4.97
Asset-Backed Securities	2.27	2.33	3.41	5.43
Mortgage	3.29	4.74	2.62	5.32
S&P 500 Index	28.69	10.88	4.91	15.79

# Size of Distressed Debt Market

# Distressed And Defaulted Debt as a Percentage of High Yield And Defaulted Debt Markets

1990 – 2006



Public deals only.  
Source: Citigroup Estimates.

# Estimated Face And Market Values Of Defaulted And Distressed Debt

	<u>Face Value</u>			<u>Market Value</u>			Market/Face Ratio
	12/31/2004	12/31/2005	12/31/2006	12/31/2004	12/31/2005	12/31/2006	
<b><u>Public Debt</u></b>							
Defaulted	\$ 152.0	\$ 163.5	\$ 156.2 <sup>(1)</sup>	\$ 76.0	\$ 89.9	\$ 101.5	0.65 <sup>(4)</sup>
Distressed	\$ 36.6	\$ 49.3	\$ 17.9 <sup>(2)</sup>	\$ 23.8	\$ 34.5	\$ 13.4	0.75 <sup>(4)</sup>
<b>Total Public</b>	<b>\$ 188.6</b>	<b>\$ 212.8</b>	<b>\$ 174.1</b>	<b>\$ 99.8</b>	<b>\$ 124.5</b>	<b>\$ 115.0</b>	
<b><u>Private Debt</u></b>							
Defaulted	\$ 334.4	\$ 359.8	\$ 406.1 <sup>(3)</sup>	\$ 234.1	\$ 287.8	\$ 365.5	0.90 <sup>(4)</sup>
Distressed	\$ 80.6	\$ 108.5	\$ 46.6 <sup>(3)</sup>	\$ 68.5	\$ 97.6	\$ 44.3	0.95 <sup>(4)</sup>
<b>Total Private</b>	<b>\$ 415.0</b>	<b>\$ 468.2</b>	<b>\$ 452.7</b>	<b>\$ 302.6</b>	<b>\$ 385.4</b>	<b>\$ 409.7</b>	
<b>Total Public and Private</b>	<b>\$ 603.6</b>	<b>\$ 681.1</b>	<b>\$ 626.8</b>	<b>\$ 402.4</b>	<b>\$ 509.9</b>	<b>\$ 524.7</b>	

(1) Calculated using: (2005 defaulted population) + (2006 defaults) - (2006 Emergences)

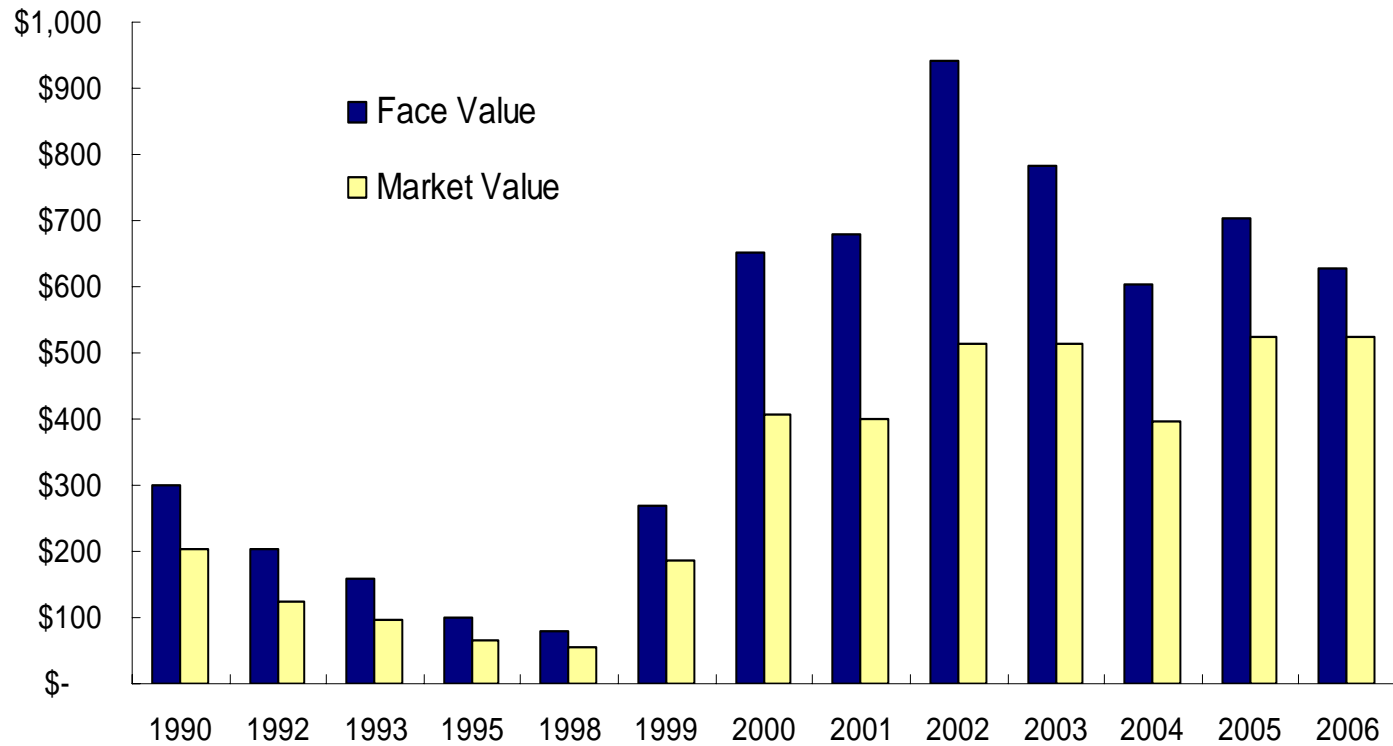
(2) Based on 1.70% of the high yield bond market (\$1039.7 billion)

(3) Based on a private/public ratio of 2.6.

(4) The market/face value ratio was 0.65 for public defaulted debt, 0.75 for public distressed debt, 0.90 for private defaulted debt and 0.95 for private distressed debt in 2006.

Sources: Estimated by Professor Edward Altman, NYU Stern School of Business from NYU Salomon Center's Defaulted Bond and Bank Loan Databases

### SIZE OF THE US DEFAULTED AND DISTRESSED DEBT MARKET (\$ Billions) (1990-2006)



# Returns and Correlations of the Defaulted Debt Markets

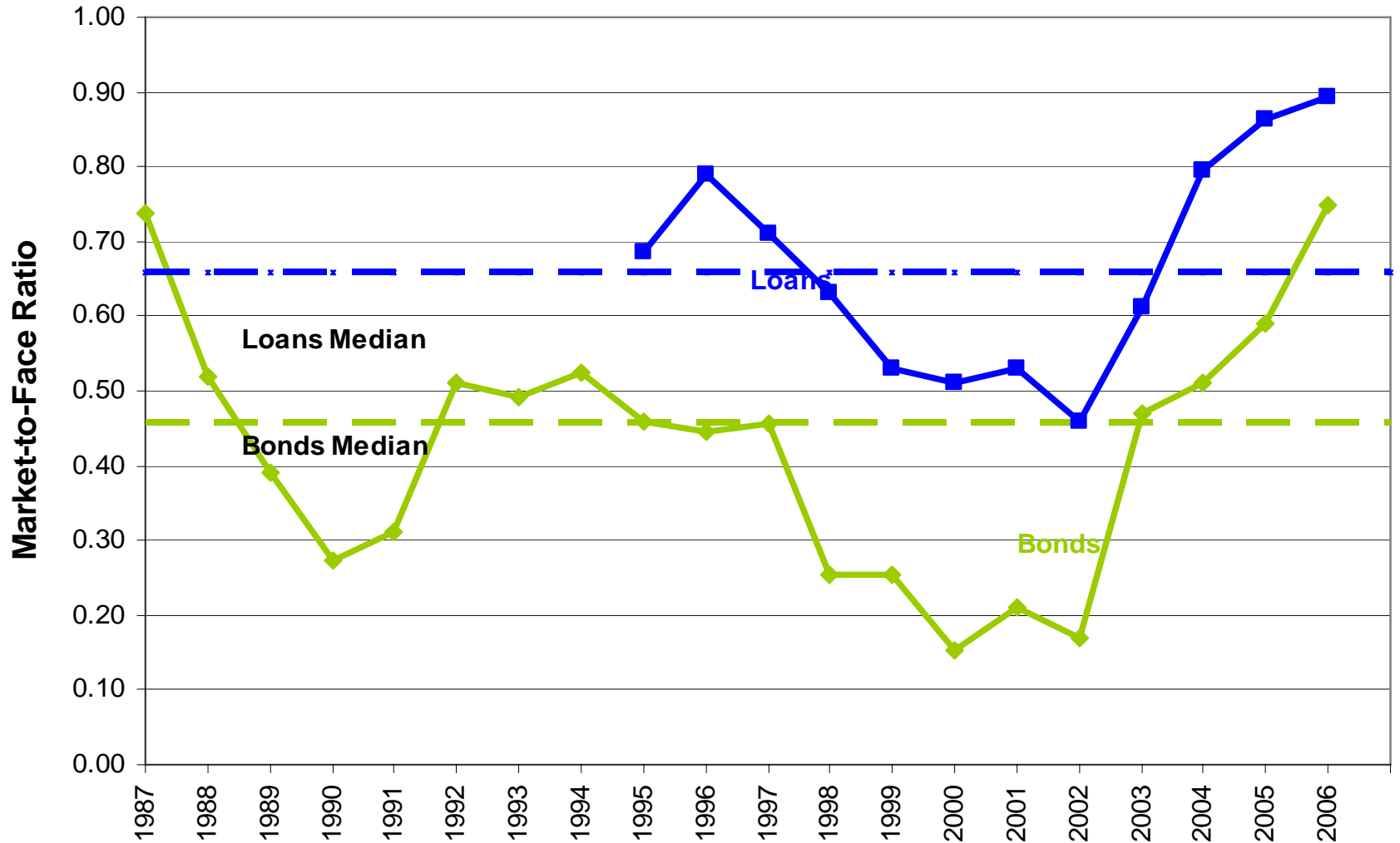


**SIZE OF THE ALTMAN-NYU SALOMON CENTER  
DEFAULTED BOND INDEX  
(1987 - Oct 2006)**

<b>Year End</b>	<b>Number of Issues</b>	<b>Number of Firms</b>	<b>Face Value (\$ Billions)</b>	<b>Market Value (\$ Billions)</b>	<b>Market / Face Ratio</b>
1987	53	18	5.7	4.2	0.74
1988	91	34	5.2	2.7	0.52
1989	111	35	8.7	3.4	0.39
1990	173	68	18.7	5.1	0.27
1991	207	80	19.6	6.1	0.31
1992	231	90	21.7	11.1	0.51
1993	151	77	11.8	5.8	0.49
1994	93	35	6.3	3.3	0.52
1995	50	27	5.0	2.3	0.46
1996	39	28	5.3	2.4	0.45
1997	37	26	5.9	2.7	0.46
1998	36	30	5.5	1.4	0.25
1999	83	60	16.3	4.1	0.25
2000	129	72	27.8	4.3	0.15
2001	202	86	56.2	11.8	0.21
2002	166	113	61.6	10.4	0.17
2003	128	63	36.9	17.7	0.48
2004	104	54	32.1	16.9	0.53
2005	98	35	29.9	17.5	0.59
2006	85	36	31.2	23.3	0.75

# Defaulted Debt Indexes: Market-to-Face Value Ratios

(Annual 1987 - 2006)



Loans Median Market-to-Face value is 0.66 and Average Market-to-Face value is 0.67

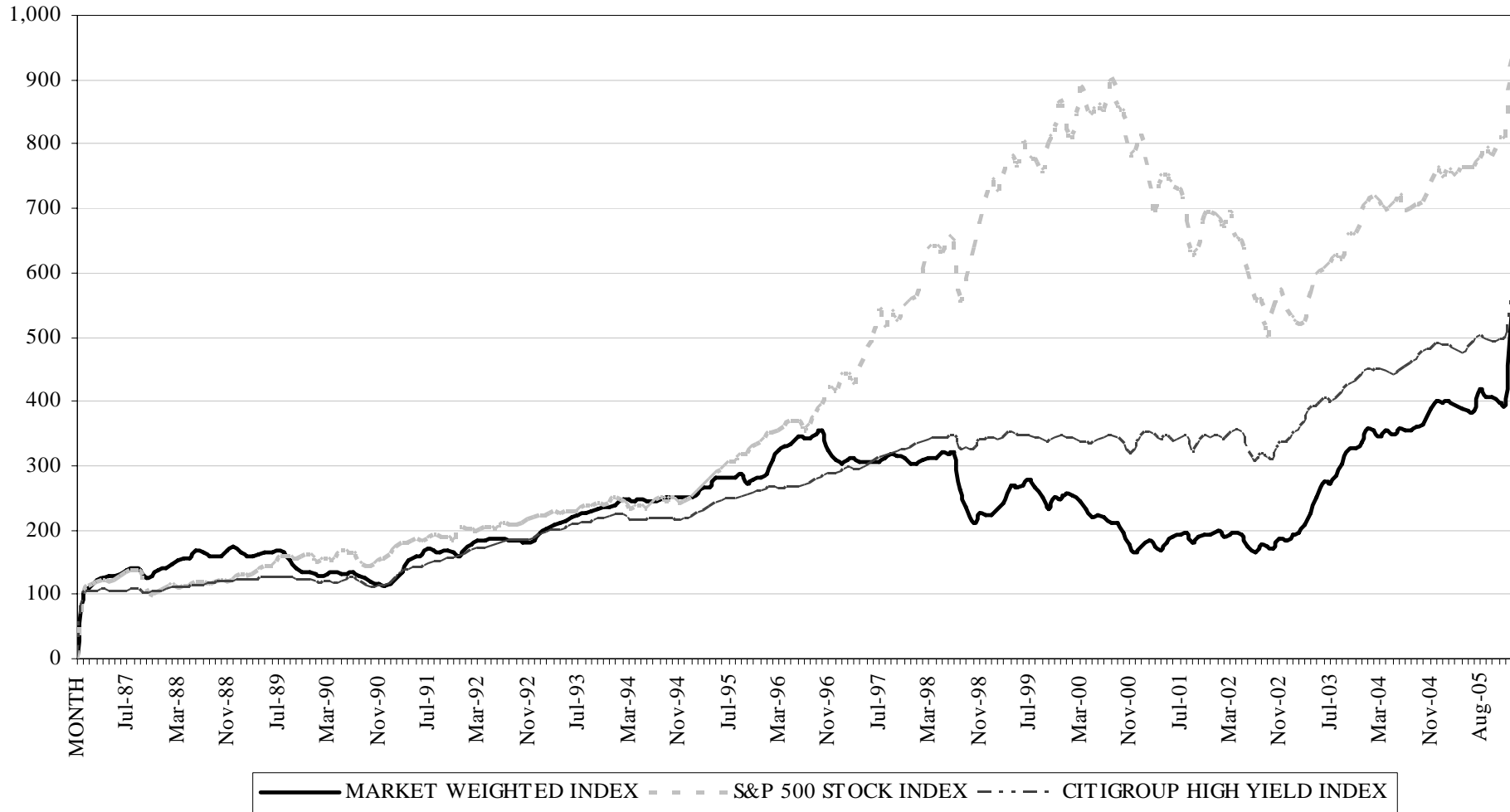
Bonds Median Market-to-Face value is 0.46 and Average Market-to-Face value is 0.41

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

**COMPARISON OF RETURNS  
(1987 - 2006)**

<b>Year</b>	<b>Altman-NYU Salomon Center Defaulted Bond Index</b>	<b>S&amp;P 500 Stock Index</b>	<b>Citigroup High Yield Bond Index</b>
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%
2005	-1.78%	4.92%	2.08%
2006	35.62%	15.80%	11.85%
<b>1987 - 2006 Arithmetic Average (Annual) Rate</b>	<b>11.90%</b>	<b>13.08%</b>	<b>9.49%</b>
<b>Standard Deviation</b>	<b>27.52%</b>	<b>16.68%</b>	<b>11.78%</b>
<b>1987 - 2006 Compounded Average (Annual) Rate</b>	<b>8.74%</b>	<b>11.84%</b>	<b>8.92%</b>
<b>1987 - 2006 Arithmetic Average (Monthly) Rate</b>	<b>0.79%</b>	<b>1.02%</b>	<b>0.74%</b>
<b>Standard Deviation</b>	<b>4.23%</b>	<b>4.31%</b>	<b>2.03%</b>
<b>1987 - 2006 Compounded Average (Monthly) Rate</b>	<b>0.70%</b>	<b>0.93%</b>	<b>0.72%</b>

# DEFAULTED BOND, STOCK, AND HIGH YIELD BOND INDICES 1987 - 2006



**SIZE OF THE ALTMAN-NYU SALOMON CENTER  
DEFAULTED BANK LOAN INDEX  
(1995 - 2006)**

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<b>Year End</b>	<b>Number of Issues</b>	<b>Number of Firms</b>	<b>Face Value (\$ Billions)</b>	<b>Market Value (\$ Billions)</b>	<b>Market/ Face Ratio</b>
1995	17	14	2.9	2.0	0.69
1996	23	22	4.2	3.3	0.79
1997	18	15	3.4	2.4	0.71
1998	15	13	3.0	1.9	0.63
1999	45	23	12.9	6.8	0.53
2000	100	39	26.9	13.6	0.51
2001	141	56	44.7	23.8	0.53
2002	64	51	37.7	17.4	0.46
2003	76	43	39.0	23.9	0.61
2004	45	26	22.9	18.2	0.80
2005	41	21	18.7	16.2	0.86
2006	27	23	11.2	10.0	0.89

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

**COMPARISON OF RETURNS  
(1996 - 2006)**

<b>Year</b>	<b>Altman-NYU Salomon Center Defaulted Bank Loan Index</b>	<b>S&amp;P 500 Stock Index</b>	<b>Citigroup High Yield Bond Index</b>
<b>1996</b>	<b>19.56%</b>	<b>22.96%</b>	<b>11.29%</b>
<b>1997</b>	<b>1.75%</b>	<b>34.36%</b>	<b>13.18%</b>
<b>1998</b>	<b>-10.22%</b>	<b>28.58%</b>	<b>3.60%</b>
<b>1999</b>	<b>0.65%</b>	<b>20.98%</b>	<b>1.74%</b>
<b>2000</b>	<b>-6.59%</b>	<b>-9.11%</b>	<b>-5.68%</b>
<b>2001</b>	<b>13.94%</b>	<b>-11.87%</b>	<b>5.44%</b>
<b>2002</b>	<b>3.03%</b>	<b>-22.08%</b>	<b>-1.53%</b>
<b>2003</b>	<b>27.48%</b>	<b>28.70%</b>	<b>30.62%</b>
<b>2004</b>	<b>11.70%</b>	<b>10.88%</b>	<b>10.79%</b>
<b>2005</b>	<b>7.19%</b>	<b>4.92%</b>	<b>2.08%</b>
<b>2006</b>	<b>4.35%</b>	<b>15.80%</b>	<b>11.85%</b>
<b>1996 - 2006 Arithmetic Average (Annual) Rate</b>	<b>6.62%</b>	<b>11.28%</b>	<b>7.58%</b>
<b>Standard Deviation</b>	<b>11.04%</b>	<b>18.69%</b>	<b>9.74%</b>
<b>1996 - 2006 Compounded Average (Annual) Rate</b>	<b>6.11%</b>	<b>9.74%</b>	<b>7.20%</b>
<b>1996 - 2006 Arithmetic Average (Monthly) Rate</b>	<b>0.55%</b>	<b>0.87%</b>	<b>0.60%</b>
<b>Standard Deviation</b>	<b>2.58%</b>	<b>4.32%</b>	<b>2.17%</b>
<b>1996 - 2006 Compounded Average (Monthly) Rate</b>	<b>0.51%</b>	<b>0.78%</b>	<b>0.58%</b>

# CORRELATION OF ALTMAN NYU-SALOMON CENTER INDEXES OF DEFAULTED BONDS WITH OTHER SECURITIES INDEXES 1987 - 2006

## Correlation of Monthly Returns January 1987 - Dec 2006

	ALTMAN BOND INDEX	S&P 500	CITIGROUP HY	10 YR T-BOND
ALTMAN BOND INDEX	100.00%	28.70%	60.74%	-11.51%
S&P 500		100.00%	50.39%	3.63%
CITIGROUP HY			100.00%	5.92%
10 YR T-BOND				100.00%

**COMBINED ALTMAN-NYU SALOMON CENTER  
DEFAULTED PUBLIC BOND AND BANK LOAN INDEX**

**COMPARISON OF RETURNS  
(1996 - 2006)**

<b>Year</b>	<b>Altman-NYU Salomon Center Combined Index</b>	<b>S&amp;P 500 Stock Index</b>	<b>Citigroup High Yield Bond Index</b>
<b>1996</b>	<b>15.62%</b>	<b>22.96%</b>	<b>11.29%</b>
<b>1997</b>	<b>0.44%</b>	<b>34.36%</b>	<b>13.18%</b>
<b>1998</b>	<b>-17.55%</b>	<b>28.58%</b>	<b>3.60%</b>
<b>1999</b>	<b>4.45%</b>	<b>20.98%</b>	<b>1.74%</b>
<b>2000</b>	<b>-15.84%</b>	<b>-9.11%</b>	<b>-5.68%</b>
<b>2001</b>	<b>15.53%</b>	<b>-11.87%</b>	<b>5.44%</b>
<b>2002</b>	<b>-0.53%</b>	<b>-22.08%</b>	<b>-1.53%</b>
<b>2003</b>	<b>49.30%</b>	<b>28.70%</b>	<b>30.62%</b>
<b>2004</b>	<b>15.40%</b>	<b>10.88%</b>	<b>10.79%</b>
<b>2005</b>	<b>1.84%</b>	<b>4.92%</b>	<b>2.08%</b>
<b>2006</b>	<b>23.40%</b>	<b>15.80%</b>	<b>11.85%</b>
<b>1996 - 2006 Arithmetic Average (Annual) Rate</b>	<b>8.37%</b>	<b>11.28%</b>	<b>7.58%</b>
<b>Standard Deviation</b>	<b>18.74%</b>	<b>18.69%</b>	<b>9.74%</b>
<b>1996 - 2006 Compounded Average (Annual) Rate</b>	<b>6.95%</b>	<b>9.74%</b>	<b>7.20%</b>
<b>1996 - 2006 Arithmetic Average (Monthly) Rate</b>	<b>0.61%</b>	<b>0.87%</b>	<b>0.61%</b>
<b>Standard Deviation</b>	<b>3.07%</b>	<b>4.34%</b>	<b>2.18%</b>
<b>1996 - 2006 Compounded</b>	<b>0.56%</b>	<b>0.78%</b>	<b>0.59%</b>



# CORRELATION OF ALTMAN NYU-SALOMON CENTER INDEXES OF DEFAULTED LOANS WITH OTHER SECURITIES INDEXES 1987 - 2006

## Correlation of Monthly Returns January 1996 - Dec 2006

	ALTMAN LOAN INDEX	S&P 500	CITIGROUP HY	10 YR T-BOND	ALTMAN BOND INDEX
ALTMAN LOAN INDEX	100.00%	-0.14%	42.92%	-8.11%	58.16%
S&P 500		100.00%	49.92%	-10.87%	24.28%
CITIGROUP HY			100.00%	-8.46%	62.71%
10 YR T-BOND				100.00%	-12.05%
ALTMAN BOND INDEX					100.00%

# U.S. Distressed Debt Managers 2007

Abrams Capital	Canyon Capital	DDJ Capital Management
AEG	Camulous Capital	Deephaven Capital Management
Angelo, Gordon & Company	Cardinal Capital	Delaware Street Capital
Apex Fundamental Partners LLC	Carl Marks	Elliott Advisors
Apollo Management	Carlyle Strategic Partners	Endurance Capital
Appaloosa Management	Cargill Value Investment	Deltec Recovery Fund
Ares Corporate Opportunities Fund	Catlock Capital	Durham Asset Management
Ashmore Asian Recovery	Centerbridge Capital	Eagle Rock Capital
Avenue Capital Group	Cerebrus Partners	EOS Partners
Basso Asset Management	Chrysalis Capital Partners	Epic Asset Management
Bay Harbour Advisors	Citadel Investments	Fairfield Greenwich
Bayside Capital	Cohanzick Management	Farallon Partners
Beltway Capital	Commonwealth	Forest Investment Management
Bennett Management Company	Concordia Advisors	Franklin Mutual Recovery
Black Diamond	Contrarian Capital Management	Fortress Capital Corp.
Blackport Capital Fund, LTD	Corsair	GE Finance
Boone Capital Management	Cypress Management	Glenview Capital Management
Brigade Capital	D.B. Zwirn Partners	Golden Capital
The Broe Companies	D.E. Shaw	Golden Tree LLC
Buckeye Capital Partners	Davidson/Kempner (MH Davidson)	Gracie Capital

# U.S. Distressed Debt Managers 2007

Gradient Partners L.P.	KPS Special Situations Fund	Moore Asian Recovery Fund
Gramercy Capital	KS Distressed Debt	MSD Capital
Greenwich Capital	Lampe Conway	Murray Capital
Greywolf Capital	Langley Management	MW Post
Gruss Asset Management L.P.	Laurel Ridge Asset Management	New Generation Advisers
GSC Capital	Leucadia National Corporations	Oakhill
H.I.G.	Levco Debt Opportunities	Oaktree Capital
Halcyon/Slika (Alan B.) Mgmt.	Litespeed Partners	Och Ziff Friedheim
Harbert Capital	Loeb Partners	Owl Creek Capital
Harvest Capital	Lonestar Partners LP	Pacholder Associates, Inc.
Helios Advisors	LongAcre Capital Partners	Pacific Alternative Asset Management
Highbridge Capital Management	Longroad Asset Management	Pardus Capital
Highland Capital	Marathon Capital LLC	Patriarch
Industria Partners	Mariner Investment Group	Pegasus Investors
Ivory Investment Management	Mason Capital Management	Pequot Capital
JLL Partners	MatlinPatterson Global Advisors	Perry Partners
JMB Capital	Mellon HBV Capital Management	Peter Schoenfeld Asset Management
K Capital Partners	MHR	Pine Creek
KD Distressed Capital	Millennium	Pinewood Capital Partners LLC
Kilimanjaro Advisors	MJ Whitman Mgmt Co.	Plainfield Asset Management
King Street Advisors	Monomoy Capital	PMI

# U.S. Distressed Debt Managers 2007

PPM America	Silvergang	Tyndall Partners
Proprietary Trading of Market Makers	Silverpoint Capital	Van Kampe
Quadrangle Group LLC	Spring Street	Varde Partners, Inc.
Questor Management	Stanfield Capital Management	W.L. Ross & Co.
Radius Equity Partners	Stairway Capital Advisors	Wayland Fund
Redwood Capital	Stark Investments	Wellspring Capital Partners
Republic	Strategic Value Partners	Wexford Capital
Resolution Partners	Summit	William E. Simon & Sons
Restoration Capital Management	Stonehill Capital	Woodside Management
Resurgence Corporate Fund	Sun Capital Partners, Inc.	Whippoorwill Associates, Inc.
Rebco/Weiss Peck & Greer	Sunrise Capital Partners	Xerion Partners
Salisbury	TA Mckay & Co.	York Capital
Sandell Asset Management	Taconic Capital Partners	
Satellite Asset Management	The Baupost Group	
Sato Capital	Third Avenue Value Fund	
Schultze Asset Management	TPG Credit Management	
Scoggin Capital	Triage Capital	
Scott's Cove Capital Mgmt. LLC	Trilogy Capital	
Seneca Capital Investment Partnership	Trust Company of the West	
Signature Capital Partners	Turnberry Capital	

## U.S. Distressed Funds with European Offices

Avenue Capital Group  
Cargill Investors  
Cerebrus Partners  
Citadel Investments  
Davidson Kempner  
Elliott Advisors  
EOS Partners  
Fortress Capital Corp  
HBK Investments LP  
Highbridge Capital Management  
Lonestar Partners LP  
Marathon Capital LLC  
Matlin Patterson Global Advisors  
Millennium Capital  
Oaktree Capital  
Och Ziff Capital Management  
Peter Schoenfeld Asset Management  
Silverpoint Capital  
Strategic Value Partners  
Texas Pacific Credit  
TPG Credit Management

## European Distressed Debt Managers as of January 2007

Argo Capital  
Bluebay Asset Management  
Centaurus Capital  
Cheyne Capital  
Cognis Capital  
Cyrus Capital  
Glencore Finance  
Orn Capital  
Picus Capital Management  
RAB Capital  
Sisu Capital  
Thames River LLP  
Tisbury Capital  
Trafalgar Asset Managers

# Distressed Active/Control Investors 2007

Angelo, Gordon & Co.  
Apollo management  
Appaloosa Management LP  
Avenue Capital partners  
Carlyle Strategic partners  
Centerbridge Capital Partners  
Cerberus partners  
Citadel Limited Partnership  
D.B. Zwirn Partners  
D.E. Shaw  
Elliott Associates, L.P.  
Farallon Capital  
Harbinger Capital Partners  
Industria Partners  
KPS Special Situations Fund  
MatlinPatterson Global Advisors

Mellon HBV  
Monomoy Capital Partners  
Oakhill  
Oaktee Capital  
P. Schoenfeld Asset Management LLC  
Perry Capital  
Plainfield Asset Mgt  
Ramius Capital Group LLC  
Sandell Asset Management Corp  
Silver Point Capital L.P.  
Stark Investments  
Sun Capital Partners  
Tudor Investment Corp et al  
W.L. Ross & Co  
Whippoowill Associates

# Investment Styles and Target Returns in Distressed Debt Investing

<u>Active/Control</u>	<u>Active/Non-Control</u>	<u>Passive</u>
Requires 1/3 minimum to block and ½ to control; may require partner(s)	Senior secured, senior unsecured	Invest in undervalued securities trading at distressed levels
Take Control of company through debt/equity swap	Active participation in restructuring process; Influence process	Sub-strategies: trading/buy-hold/senior or senior secured/sub debt/“busted converts”/capital structure arbitrage/long-short, value
Restructure or even purchase related businesses; roll-up	Exit via debt or equity (post-chapter 11) markets	Trading oriented; Sometimes get restricted
Equity infusion; run Company	Generally do not control	Holding period of 6 months to 1 year generally; Longer sometimes
Exit 2-3 years	Holding period of 1-2 years	Target return: 12-20%
Large or Mid-Small Cap focus	Large or Mid-Small Cap focus	
Target return: 20-25%	Target return: 15-20%	

# Forecasting Defaults and the Default Rate



# Forecasting Defaults and the Default Rate

## *MODEL DRIVERS*

- Mortality Rate Estimates: 1971 - 2005  
= f {bond rating, age, redemptions, defaults}
- Historical New Issuance over last 10 years by credit quality
  - Bond-ratings
  - Z-score Bond-equivalent ratings

*New Defaults and Default Rate in 2006*

- Estimate high yield market growth in 2006

*New Defaults and Default Rate in 2006*

# Marginal and Cumulative Mortality Rate Equation

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

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,

$$\text{CMR}_{(t)} = 1 - \prod_{t=1}^T \text{SR}_{(t)},$$

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	--	--	--	--	--	--
<b>Total</b>	<b>1,500</b>	<b>50</b>	<b>100</b>	<b>25</b>	<b>100</b>	<b>200</b>	<b>40</b>
Amount Start of Period	1,500	-	175	-	1,325	- 340	= 985
<b>Marginal Mortality Rate</b>		<b>Year 1</b>			<b>Year 2</b>		
		50/1,500 = 3.3%			100/1,325 = 7.5%		
<b>Cumulative Rate</b>		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<sup>a</sup> 1971-2006

Years after issuance

		1	2	3	4	5	6	7	8	9	10
AAA	Marginal	0.00%	0.00%	0.00%	0.00%	0.05%	0.03%	0.01%	0.00%	0.00%	0.00%
	Cumulative	0.00%	0.00%	0.00%	0.00%	0.05%	0.08%	0.09%	0.09%	0.09%	0.09%
AA	Marginal	0.00%	0.00%	0.30%	0.14%	0.02%	0.02%	0.00%	0.00%	0.05%	0.01%
	Cumulative	0.00%	0.00%	0.30%	0.44%	0.46%	0.48%	0.48%	0.48%	0.53%	0.54%
A	Marginal	0.01%	0.08%	0.02%	0.06%	0.06%	0.09%	0.05%	0.20%	0.09%	0.05%
	Cumulative	0.01%	0.09%	0.11%	0.17%	0.23%	0.32%	0.37%	0.57%	0.66%	0.71%
BBB	Marginal	0.33%	3.13%	1.34%	1.24%	0.74%	0.31%	0.25%	0.19%	0.14%	0.40%
	Cumulative	0.33%	3.45%	4.74%	5.92%	6.62%	7.10%	7.33%	7.51%	7.63%	8.00%
BB	Marginal	1.15%	2.42%	4.32%	2.26%	2.53%	1.27%	1.61%	1.11%	1.71%	3.47%
	Cumulative	1.15%	3.54%	7.72%	9.88%	12.10%	13.20%	14.60%	15.56%	17.00%	19.88%
B	Marginal	2.84%	6.78%	7.35%	8.49%	6.01%	4.32%	3.95%	2.40%	1.96%	0.83%
	Cumulative	2.84%	9.43%	16.08%	23.21%	27.82%	30.94%	35.67%	35.26%	36.53%	37.06%
CCC	Marginal	8.12%	15.42%	18.75%	11.76%	4.14%	9.33%	5.79%	5.70%	0.85%	4.70%
	Cumulative	8.12%	22.30%	36.86%	44.30%	46.60%	51.57%	54.38%	56.98%	57.34%	59.36%

(a) Rated by S&P at Issuance

Based on 1,955 issues

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

# Mortality Losses by Original Rating

## All Rated Corporate Bonds<sup>a</sup> 1971-2006

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%	0.05%	0.04%	0.01%	0.01%	0.00%	0.00%	0.02%	0.00%
	Cumulative	0.00%	0.00%	0.05%	0.09%	0.10%	0.11%	0.11%	0.11%	0.13%	0.14%
A	Marginal	0.00%	0.03%	0.01%	0.04%	0.03%	0.04%	0.02%	0.03%	0.06%	0.00%
	Cumulative	0.00%	0.03%	0.04%	0.08%	0.11%	0.15%	0.17%	0.20%	0.26%	0.26%
BBB	Marginal	0.23%	2.19%	1.06%	0.45%	0.44%	0.21%	0.10%	0.11%	0.07%	0.23%
	Cumulative	0.23%	2.41%	3.45%	3.88%	4.31%	4.54%	4.63%	4.74%	4.80%	5.02%
BB	Marginal	0.67%	1.41%	2.50%	1.27%	1.47%	0.65%	0.90%	0.48%	0.85%	1.25%
	Cumulative	0.67%	2.07%	4.52%	5.73%	7.12%	7.72%	8.55%	8.99%	9.76%	10.89%
B	Marginal	1.83%	4.74%	4.92%	5.49%	3.90%	2.37%	2.56%	1.34%	1.03%	0.61%
	Cumulative	1.83%	6.48%	11.08%	15.97%	18.37%	19.24%	21.31%	22.36%	23.16%	23.63%
CCC	Marginal	5.44%	11.10%	13.50%	8.46%	2.90%	7.00%	4.34%	4.41%	0.51%	3.01%
	Cumulative	5.44%	15.94%	27.38%	33.44%	35.37%	39.89%	42.50%	45.04%	45.32%	46.96%

(a) Rated by S&P at Issuance

Based on 1,777 issues

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

# Z'' Score Model for Manufacturers, Non-Manufacturer Industrials, & Emerging Market Credits

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

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

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

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

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

# US Bond Rating Equivalent Based on Adjusted Z'' Score Model

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

US Equivalent Rating	Average Z'' Score	Sample Size
AAA	8.15	8
AA+	7.6	-
AA	7.3	18
AA-	7	15
A+	6.85	24
A	6.65	42
A-	6.4	38
BBB+	6.25	38
BBB	5.85	59
BBB-	5.65	52
BB+	5.25	34
BB	4.95	25
BB-	4.75	65
B+	4.5	78
B	4.15	115
B-	3.75	95
CCC+	3.2	23
CCC	2.5	10
CCC-	1.75	6
D	0	14

# Forecasted High Yield Market Size, Defaults and Default Rates for 2005, 2006 and 2007

	<b>High Yield Market (\$ Billion)</b>	<b>Default Rate (%)</b>		<b>Default Amount (\$ Billions)</b>
<b>2005</b>	\$955.0	3.00%	*	28.70
<b>2005 (actual)</b>	\$1,073.0	3.37%		36.20
<b>2006</b>	\$1,110.0	4.27%	**	47.40
<b>2006 (actual)</b>	\$1,039.7	0.76%		7.56
<b>2007</b>	\$1,100.0	2.50%	***	27.55
<b>2008</b>	\$1,200.0	3.72%	***	32.61

\* as of January 2005

\*\* as of January 2006

\*\*\* as of January 2007