

The Market in Defaulted Bonds and Bank Loans

2005 review and 2006 predictions.

Edward I. Altman and William Stonberg

EDWARD I. ALTMAN

is the Max L. Heine professor of finance and director of the Credit and Debt Markets Research Program at the New York University Salomon Center, Leonard N. Stern School of Business, in New York City.
ealtman@stern.nyu.edu

WILLIAM STONBERG

is a research associate at the New York University Salomon Center.
wes219@stern.nyu.edu

The good news for investors in the distressed debt market in 2005 is an increase in the face and market values of defaulted bonds and bank loans by over \$100 billion. The bad news? It was the end of a two-year string of very impressive returns on investment in defaulted bonds and bank loans. A long-only strategy of investing in defaulted bonds and bank loans yielded barely positive returns in 2005.

The 2005 yearly return on the Altman-New York University Salomon Center Defaulted Bond Index registered a negative 1.78%, but the market-to-face value ratio increased to a near-record 0.59. The latter figure was driven by a surge in the recovery rate on newly defaulted bonds in 2005, several related to very large bankruptcies.

The Altman-NYU Salomon Center Defaulted Bank Loan Index performed considerably better in 2005 than defaulted bonds, with a 7.19% annual return—pretty much in line with average distressed debt hedge fund performance. The market-to-face value ratio of the index surged to a record 0.86, reflecting both increased prices on existing loans and very high price levels on newly defaulted, secured bank loan defaults.

The Combined Index of Defaulted Bonds and Bank Loans increased by a below-average 1.84%. This index slightly underperformed the return on the S&P 500 stock index (+4.92%) and the Citigroup High-Yield Bond Index (+2.08%).

In 2005, the face value of the defaulted public bond and private debt market increased to over \$700 billion—an increase of about \$100 billion over the 2004 total. The market value estimate of \$525 billion was an even greater increase over the level one year earlier. These increases reflect a relatively high new defaulting debt total and an

increase in the distress ratio of high-yield bonds (bonds yielding more than 1,000 basis points over ten-year U.S. Treasuries).

As for the outlook, the key areas to consider are the expected change in the defaulted and distressed debt population and the amount of demand from the increasing number of distressed debt investors. Finally, we must consider the fact that the existing price levels of distressed and defaulted debt are possibly at, or close to, an all-time record high level, reflecting a fairly fully priced market.

According to our traditional mortality rate forecasting technique and the observed very high levels of newly issued high-yield bonds rated B- or below, we are again forecasting higher default rates in 2006 and even higher rates in 2007. Our method was very accurate for our 2005 prediction (3.00% forecast, 3.37% actual). For 2006, we are predicting about a 4.0% dollar-denominated default rate and as much as 5.0% or more in 2007.

We continue to observe a fairly strong appetite for distressed debt among new and current investors, so both supply and demand should be up in 2006. The high price levels could result in another challenging year for this market, which has become unquestionably one of the most popular hedge fund asset classes.

We know of about 160 distressed debt investors. At least two dozen operate outside the United States, and another 10-15 European-based investors who do not have a U.S. operation. These distressed institutional investor enterprises practice an increasingly diversified set of strategies in

both domestic and international markets. The distressed debt market outside the United States seems every bit as large as, if not larger than, the U.S. market, but it is located in somewhat uncertain legal and credit environments, and far less of this mainly bank loan market is available for trading at the moment.

MEASURING AND MONITORING PERFORMANCE OF DEFAULTED BONDS

The Altman-NYU Salomon Center Defaulted Bond Index was developed in 1990 to measure and monitor the performance of defaulted debt securities.* The sample period, which begins in January 1987, included, as of December 31, 2005, 98 issues from 35 firms (see Exhibit 1). Its market value was \$17.5 billion, and its face value \$29.9 billion. This is about one-and-a-half times the face value and three times the market value levels during the early 1990s, but about half the face value level of the record total in 2002.

Because of the enormous increase in prices of existing default bonds in 2003 and in the prices of newly defaulted bonds, especially in 2004 and 2005, the market value level of the index at year-end 2005 was actually higher than the level in 2002 and about the same as in 2003 after the record returns in that year.

Exhibit 1 exhibits various measures of the index size since its 1987 inception. There is notable variability in the number of issues, with a low of 36 in 1998 and a high of 231 in 1992. The huge new-issue supply of non-investment-grade debt in the years 1996-1999 resulted in a large increase of default amounts during subsequent years through 2002.

With the drop in default rates in 2003 and 2004 and a culling of issues that do not trade regularly, we observed a marked reduction in the number of issues and the face value of the index as of year-end 2004. In 2005, the face value dollar amount and the number of issues declined slightly, but the market value increased.

Defaulted Bank Loan Index

Managers of distressed securities routinely invest in the distressed bonds and the private debt (particularly bank debt) of defaulting companies. The size and liquidity of the distressed loan market have increased

EXHIBIT 1

Altman-NYU Salomon Center Defaulted Bond Index—1987-2005

Year-End	Number of Issues	Number of Firms	Face Value (\$ Billions)	Market Value (\$ Billions)	Market/Face Ratio
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

Sources: NYU Salomon Center, Credit and Debt Markets Program.

EXHIBIT 2

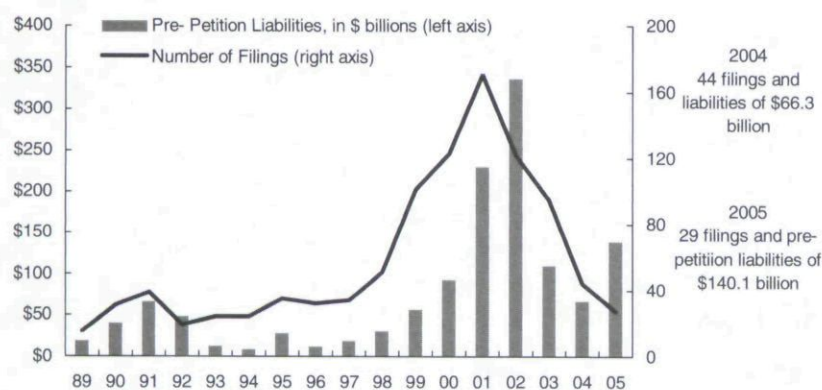
Altman-NYU Salomon Center Defaulted Bank Loan Index—1995-2005 (Dollars in Billions)

Year-End	Number of Issues	Number of Firms	Face Value (\$ Billions)	Market Value (\$ Billions)	Market/Face Ratio
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

Source: Altman-NYU Salomon Center Defaulted Bank Loan Index Database.

EXHIBIT 3

Chapter 11 Filings and Pre-Petition Liabilities of Public Companies—1989-2005 (Dollars in Billions)



Note: Minimum \$100 million in liabilities.

Source: NYU Salomon Center bankruptcy filings database.

as market makers have devoted considerable resources to bank loan trading.

We responded to this increased emphasis on bank loans by introducing in 1996 an index of defaulted bank debt facilities, as well as a combined index of bonds and bank loans. Over 2003-2005, there was considerable trading in distressed bank debt (loans trading at or below 90 cents on the dollar). Indeed, 40% of the trading was in distressed and defaulted loans in 2003, with 27% in 2004 and 23% in 2005 (data are from the Loan Pricing Corporation).

The Altman-NYU Salomon Center Index of Defaulted Bank Loans, like the Defaulted Bond Index, is a market-weighted monthly total return index composed of U.S. and Canadian companies. The index included 17

facilities at its inception in December 1995 and grew to a high of 141 facilities from 56 borrowers as of December 31, 2001. It has since shrunk to 41 facilities from 21 borrowers at the end of 2005, with a face value of \$18.7 billion and a market value of \$16.2 billion (see Exhibit 2).

While there was an increase in the liabilities of bankrupt companies in 2005, new bank debt from these companies represented a lower proportion than in earlier years (Exhibit 3). Indeed, the senior secured bond proportion was much greater from defaults in 2005, such as Delta and Northwest Airlines, Charter Communications, and Calpine Corp. The latter's default, and one or two others, included some second-lien bonds and loans.

Market/Face Value Ratios

We consider the ratio of the aggregate market value-to-face value of the component securities in our indexes to be an important measure of the defaulted debt markets' current relative health and potential future returns. This ratio for defaulted *bonds* has ranged, at year-end, from a maximum level of 0.74 in 1987 to a minimum of 0.15 in 2000 (see Exhibit 4).

While the defaulted bond index market/face value ratio has varied within a fairly narrow range of 0.30 to 0.55 during a majority

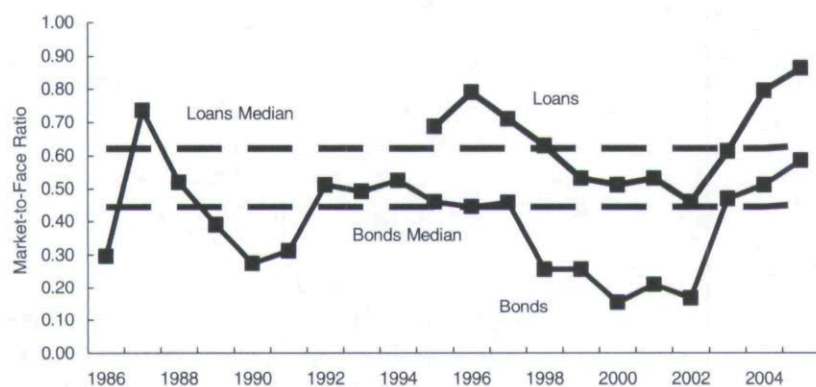
of years in our 19-year sample period (1987-2005), abnormal annual returns for the index and unusual recovery rate years have resulted in a number of market/face value ratio observations well outside this range. The ratio was 0.25 or below for the five-year period of 1998-2002 and ended 2002 at 0.17.

In 2003, the ratio almost tripled to 0.47, increasing further in 2004 to 0.53 and to a near-record level of 0.59 in 2005. The trend in the market/face value ratios of defaulted bonds and bank loans, as well as the historical medians can be seen in Exhibit 4. Note that the Defaulted Bank Loan Index dropped to its all-time low in 2002 of 0.46, but rebounded sharply to 0.61 one year later. It reached a record level of 0.86 as of year-end 2005.

One can conclude that if there is movement in the average price level of both defaulted bonds and bank loans

EXHIBIT 4

Altman-NYU Salomon Center Defaulted Debt Indexes— Market-to-Face Value Ratios, Annual 1987-2005



Note: The loans' median market-to-face value is 0.63, and the average market-to-face value is 0.65. Bonds' median market-to-face value is 0.45, and the average market-to-face value is 0.41.

Source: NYU Salomon Center.

that resembles a regression to the mean, both indexes should decline. From Exhibit 4, we can observe that the level of the market/face value ratio at the end of 2005 was considerably above mean and median levels for 1987-2005 for defaulted bonds (0.59 versus 0.45 median) and considerably above the mean (0.65) and median level (0.63) for defaulted bank loans. The latter's level in 2005 (0.86) grew over the 2004 ratio (0.80). This implies a very frothy and perhaps fully priced market, which has likely resulted in a challenging investment climate for 2006. Our prognosis was very similar last year.

Our indexes are based on a long-only defaulted securities investment strategy. Many distressed debt investors now do not follow such a strategy, but rather hedge their portfolios through various arbitrage strategies using shorting techniques such as capital structure arbitrage and credit default swaps. And, distressed investors are also investing in other instruments such as distressed but not defaulted debt, the equity of firms emerging from bankruptcy, and foreign company securities, as well as holding cash.

PERFORMANCE MEASUREMENT

Our indexes include the securities of firms at various stages of reorganization either in bankruptcy or restructuring. We calculate returns for the index using data compiled from just after default to the time the bankrupt firm emerges from Chapter 11, is liquidated, or until the default is cured or resolved through an exchange. The securities

of distressed restructured companies are also included in the index until the restructuring is completed. The Defaulted Bond Index includes issues of all securities, from senior-secured to junior unsecured debt.

Altman and Eberhart [1994] and Brand and Behar [2000] measure the performance of defaulted debt from the time of original issuance through default and then to emergence from bankruptcy. They find seniority of the issue an extremely important characteristic of the performance of defaulted securities over specific periods, whether from issuance to emergence or from default to emergence. And, in 2005, there was a large new supply of senior-secured defaulted bonds.

Our indexes do not include convertible or non-U.S. and Canadian company issues, nor do they include distressed, but not

defaulted, securities. And, as noted, the performance measure is based on a fully invested long-only strategy. Returns are calculated from individual bond and bank loan security movements; they are not based on any average performance by managers. Returns are gross returns and do not reflect manager fees and expenses.

A manager performance index of distressed debt investors appears daily in *The Wall Street Journal*, and there are several distressed debt hedge fund indexes reflecting a sample of investment firms' performances.

2005 Performance of Defaulted Bonds

The Altman-NYU Salomon Center Index of Defaulted Bonds performed relatively poorly in 2005, declining by 1.78%. This marks the index's seventh negative annual return in our 19-year period (Exhibits 5 and 6). The index experienced negative returns in 8 of the 12 months in 2005. Despite the increased supply of new defaulted bond issues in 2005, prices of outstanding bonds fell somewhat. The level of the index fell from 401.3 at the end of 2004 to 394.2 at the end of 2005 (December 1986 = 100).

The S&P 500 stock index finished 2005 with an annual return of 4.92% (assuming reinvestment of dividends). Defaulted bond securities underperformed the total return on the S&P 500 index for the first year in the last five years. The Defaulted Bond Index also underperformed the Citigroup High-Yield Bond Market Index, which returned 2.08%. Ten-year government bonds posted a return of 2.04% in 2005.

EXHIBIT 5

Comparison of Returns—1987-2005

Year	Altman-NYU Salomon Center Defaulted Bond Index (%)	S&P 500 (%)	Citigroup High Yield Market 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	17.8
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
Arithmetic Average (Annual) Rate, 1987–2005	10.65	12.94	9.37
Standard Deviation	27.69	17.13	12.09
Compounded Average (Annual) Rate, 1987–2005	7.49	11.64	8.77
Arithmetic Average (Monthly) Rate, 1987–2005	0.70	1.01	0.73
Standard Deviation	4.27	4.40	2.08
Compounded Average (Monthly) Rate, 1987–2005	0.56	0.86	0.70

Sources: Altman-NYU Salomon Center Index of Defaulted Bonds, Standard & Poor's, and Citigroup.

EXHIBIT 6

Defaulted Bond, Stock, and High-Yield Bond Indexes— Dec 86-Dec 05



Sources: Altman-NYU Salomon Center Index of Defaulted Bonds, Standard & Poor's, and Citigroup.

Nineteen-Year Comparative Performance

Exhibit 5 shows the return on defaulted bonds, common stocks, and high-yield bonds over the entire 19-year sample period, 1987–2005. The arithmetic annual

average for the Altman-NYU Salomon Center Defaulted Bond Index dropped to 10.65%, down by 0.69% from one year ago. This arithmetic average annual return is now about 2.25 percentage points below the S&P 500 (12.94% per year). The average monthly return fell by 4 b.p. (0.74% to 0.70% per month). The Defaulted Bond Index has an annual average return above that of the Citigroup High-Yield Bond Market Index (9.37% per year) for the sample period. In 8 of the 19 years, defaulted bonds performed better than the other two alternative indexes; also in eight years the Defaulted Bond Index was the poorest performer.

The standard deviation of annual returns for the defaulted bond index fell somewhat in 2005, but it remains the highest of the three indexes. Comparing volatility on a monthly basis, however, the standard deviation of monthly returns for defaulted bond issues (4.27%) is, in fact, slightly lower than the s.d. of the S&P 500 (4.40%), while each of these indexes is considerably more volatile than the High-Yield Bond Market Index (2.08%).

The discrepancy between the standard deviations of high-yield bonds and defaulted bonds is logical because high-yield bonds pay a steady fixed interest component, while defaulted bonds typically do not pay any interest at all.

Defaulted Bank Loan Performance

Defaulted private debt investment has grown as the bank loan market has increased in size and liquidity and as market makers have devoted considerable resources to bank debt trading. The superior information efficiency of the bank loan versus public bond daily prices of defaulting companies is analyzed in Altman, Gande, and Saunders [2004].

In 2005, our Defaulted Bank Loan Index again performed fairly well compared to most asset classes, returning 7.19% for the year and closing at 184.0 (December 1995 = 100). The index performed considerably better than our Defaulted Bond Index and also outperformed the Citigroup High-Yield Bond Market Index and the S&P 500 (see Exhibit 7).

EXHIBIT 7

Comparison of Altman-NYU Salomon Center Defaulted Bank Loan Index versus S&P 500 and Citigroup High Yield Market Index—1996-2005

Year	Altman-NYU Salomon Center Defaulted Bank Loan Index (%)	S&P 500 Stock Index (%)	Citigroup High Yield Market 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
2005	7.19	4.92	2.08
Arithmetic Average (Annual) Rate, 1996-2005			
	6.85	10.83	7.15
Standard Deviation			
	11.61	19.63	10.15
Compounded Average (Annual) Rate, 1996-2005			
	6.29	9.16	6.75
Arithmetic Average (Monthly) Rate, 1996-2005			
	0.56	0.84	0.57
Standard Deviation			
	2.69	4.50	2.27
Compounded Average (Monthly) Rate, 1996-2005			
	0.52	0.71	0.53

Sources: Altman-NYU Salomon Center Index of Defaulted Bank Loans, Standard & Poor's, and Citigroup.

EXHIBIT 8

Comparison of Combined Defaulted Public Bond and Bank Loan Index—1996-2005

Year	Altman-NYU Salomon Center Defaulted Public Bond and Bank Loan Index (%)	S&P 500 (%)	Citigroup High Yield Market Index (%)
1996	15.62	22.96	11.29
1997	0.44	34.36	13.18
1998	-17.55	28.58	3.60
1999	4.45	20.98	1.74
2000	-15.84	-9.11	-5.68
2001	15.53	-11.87	5.44
2002	-0.53	-22.08	-1.53
2003	49.30	28.70	30.62
2004	15.40	10.88	10.79
2005	1.84	4.92	2.08
Arithmetic Average (Annual) Rate, 1996-2005			
	6.87	10.83	7.15
Standard Deviation			
	19.04	19.63	10.15
Compounded Average (Annual) Rate, 1996-2005			
	5.43	9.16	6.75
Arithmetic Average (Monthly) Rate, 1996-2005			
	0.52	0.88	0.57
Standard Deviation			
	3.15	4.50	2.27
Compounded Average (Monthly) Rate, 1996-2005			
	0.46	0.71	0.54

Sources: Altman NYU-Salomon Center Defaulted Public Bond and Loan Index, Standard & Poor's, and Citigroup.

Over the 1996-2005 period, defaulted bank loans underperformed common stocks and high-yield bonds, but the time series is quite short. The index was the top performer in four of the ten-year sample period and was the poorest performer in three years. The Bank Loan Index logged seven positive return months in 2005.

Its average annual return since its inception in 1996 rose to 6.85% from 6.81% one year ago. The arithmetic

average annual return is 30 b.p. per year below that of the High-Yield Bond Index (7.15%) over the comparable period.

Returns on defaulted bank loans are considerably less volatile than returns on defaulted bonds and also less volatile than stocks. And, they are only slightly more volatile than high-yield bonds. This is true whether the measurement period is annual or monthly.

Combined Bond and Bank Loan Index

Our Combined Defaulted Securities Index is calculated using the relative market values and total returns of public bonds and private bank loans in our two indexes. Returns for the Combined Index, from its inception in 1996 through 2005, are displayed in Exhibit 8.

The annual return for the Combined Index was up 1.84% for 2005. The cumulative index level closed out the year at 169.3, up from 166.3 at year-end 2004 (December 1995 = 100).

The Combined Index enables us to benchmark performance criteria for a more broadly defined defaulted securities market. At the end of 2005, the market values of the Defaulted Bond versus Defaulted Bank Loan indexes were very close, at \$17.5 billion for bonds and \$16.2 billion for loans.

Index Performance Comparison

With the increased popularity of distressed debt hedge funds, the number of potential benchmark indexes has also grown. We are aware of at least eight indexes measuring various aspects of distressed securities' performance. These include our Combined Index, Moody's and Citigroup's

Bankrupt Bond Indexes, and five others that aggregate samples of distressed investing hedge funds, including the Dow Jones, CS/Tremont, Hennessee Group, HFR, and Greenwich-Van Hedge indexes. The average performance of these eight indexes in 2005 was 7.0%, but the three long-only indexes averaged only 3.5%.

The distressed hedge fund average return indexes, of course, represent the results of the various strategies

EXHIBIT 9

Correlation of Altman-NYU Salomon Center Indexes of Defaulted Bonds with Other Securities Indexes—1987-2005

	Altman Defaulted Bond Index (%)	S&P 500 (%)	Citigroup High Yield Market Index (%)	Ten-Year Tsy Bond (%)
Altman Defaulted Bond Index	100.00	28.95	61.30	-14.31
S&P 500		100.00	50.21	4.32
Citigroup High Yield Market Index			100.00	7.14
Ten-Year Treasury Bond				100.00

Source: NYU Salomon Center, Credit and Default Markets Program.

EXHIBIT 10

Correlation of Altman-NYU Salomon Center Indexes of Bank Loans with Other Securities Indexes—1996-2005

Correlation of Monthly Returns	Altman Defaulted Loan Index (%)	S&P 500 (%)	Citigroup High Yield Market Index (%)	Ten-Year Tsy Bond (%)	Altman Defaulted Bond Index (%)
Jan 96–Dec 05					
Altman Defaulted Bank Loan Index	100.00	-0.04	43.75	-11.62	59.41
S&P 500		100.00	49.58	-11.12	24.39
Citigroup High Yield Market Index			100.00	-7.95	63.47
Ten-Year Treasury Bond				100.00	-16.59
Altman Defaulted Bond Index					100.00
Jan 96–Dec 00					
Altman Defaulted Bank Loan Index	100.00	-7.41	39.51	-30.73	58.68
S&P 500		100.00	56.12	16.55	18.53
Citigroup High Yield Market Index			100.00	2.97	56.16
Ten-Year Treasury Bond				100.00	-44.65
Altman Defaulted Bond Index					100.00
Jan 01–Dec 05					
Altman Defaulted Bank Loan Index	100.00	15.06	48.79	-0.94	56.64
S&P 500		100.00	51.89	-29.20	43.39
Citigroup High Yield Market Index			100.00	-11.94	74.50
Ten-Year Treasury Bond				100.00	-0.82
Altman Defaulted Bond Index					100.00

Source: NYU Salomon Center, Credit and Debt Markets Program.

adopted by the sampled funds. These strategies include short-selling, hedging strategies like capital structure arbitrage, the use of credit derivatives, investing in the equity of emerging firms from Chapter 11, international company securities, cash accumulation, and others. The ability to short some overpriced distressed debt securities and the performance of equities of firms that emerged from Chapter 11 were particularly helpful for some investors in 2005.

DIVERSIFICATION: RETURN CORRELATIONS AND MANAGEMENT STYLES

Our analysis suggests that an effective strategy is to include distressed debt in a larger portfolio of risky secu-

rities. Several domestic pension funds and foreign portfolios have effectively used this strategy by allocating a portion of their total investments to distressed debt money managers. And of course this is the primary strategy of certain funds of funds.

Return Correlations

One of the principal ideas behind allocations to the distressed debt sector is that the returns from investing in distressed debt securities have relatively low correlations with returns of most other major asset classes and, in the case of funds of funds, different investor styles complement each other. The former can be clearly seen from the data on the correlation of returns that we have been tracking for many years and from our listing of investment strategies in Appendix A. The active/control strategy has gained increased popularity of late for both large traditional distressed debt hedge funds and also private equity firms.

Exhibit 9 exhibits the correlations between the Altman-NYU Salomon Center Defaulted Bond Index and the two other risky asset classes—common stocks and high-yield bonds—for the past 19 years. As of December 31, 2005, the monthly return correlation between defaulted bonds and the S&P 500 was only 28.95%, slightly above the historical correlation between these two asset classes.

It is of interest that this correlation is weak because holders of defaulted bonds usually exchange their debt for the equity of the emerged Chapter 11 entity, unless they sell the debt just prior to emergence. (We do not yet have an index of emerging equity performance).

The correlation between defaulted bonds and high-yield bonds is comparatively strong. The monthly correlation of returns is 61.30%, while the quarterly correlation between the two asset classes is slightly higher. Both are down slightly from the previous year. As in the past, the correlation between high-yield bonds and the Defaulted Bank Loan Index (43.75%) is weaker than that between defaulted bonds and high-yield bonds (63.47%) (see Exhibit 10). The returns for defaulted bank loans have a negative relationship with the S&P 500 (−0.04%) and

EXHIBIT 11

Correlation of Altman-NYU Salomon Center Indexes of Defaulted Bonds with Other Securities Indexes: Subperiods—1987-2005

Correlation of Monthly Returns	Altman Defaulted Bond Index (%)	S&P 500 (%)	Citigroup High Yield Market Index (%)	Ten-Year Treasury Bond (%)
Jan 87–Dec 92				
Altman Defaulted Bond Index	100.00	37.62	60.28	-18.64
S&P 500		100.00	49.25	21.52
Citigroup High Yield Market Index			100.00	21.40
Ten-Year Treasury Bond				100.00
Jan 93–Dec 98				
Altman Defaulted Bond Index	100.00	14.59	50.49	-25.18
S&P 500		100.00	61.45	26.74
Citigroup High Yield Market Index			100.00	33.92
Ten-Year Treasury Bond				100.00
Jan 99–Dec 05				
Altman Defaulted Bond Index	100.00	32.37	68.43	-6.79
S&P 500		100.00	46.81	-20.17
Citigroup High Yield Market Index			100.00	-9.87
Ten-Year Treasury Bond				100.00

Source: NYU Salomon Center, Credit and Debt Markets Program.

EXHIBIT 12

Historical Default Rates

Year	Par Value Outstanding ^a (\$)	Par Value Defaults (\$)	Default Rates (%)	Year	Par Value Outstanding ^a (\$)	Par Value Defaults (\$)	Default Rates (%)
2005	1,073,000	36,181	3.372	1980	14,935	224	1.500
2004	933,100	11,657	1.249	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				
1981	17,115	27	0.158				

(Straight bonds only excluding defaulted issues from par value outstanding)—1971-2005 (U.S. Dollars in Millions)

^aAs of mid-year.

^bWeighted by par value of amount outstanding for each year.

Source: Fenn [2006] and NYU Salomon Center Special Report, February 2006.

an even more negative correlation (-11.12%) with ten-year U.S. Treasuries.

Finally, the monthly returns correlation between our two defaulted debt indexes (bonds and bank loans) was 59.41%. A somewhat higher correlation might have

been expected, but the reality perhaps reflects the trading strategies of distressed investors, such as capital structure arbitrage, where bonds may be invested long and loans may be shorted or vice versa, as well as the success of negotiations in the relative claims of loans versus bonds during the bankruptcy process.

Exhibits 10 and 11 also show the correlation results for subsample periods. The correlations of defaulted bonds with other asset classes were weakest during the six-year benign credit cycle, 1993-1998, when default rates were extremely low (see Exhibit 12).

We report in a companion report on the high-yield bond market that the market was in a two-and-a-half year benign credit phase in 2003 and 2004 and the first half of 2005, but defaults increased considerably in the third and fourth quarters of 2005.

Diversification by Manager Style

Almost all portfolio managers involved in the distressed market are specialists in the sector, rather than investors in distressed securities within broader-based portfolios. Some hedge funds, however, provide a multi-asset alternative to investors. Therefore, the avenue of diversification appears to be primarily through the use of different investment managers, although there are some rare exceptions when a fund invests in more traditional debt and equity securities combined with distressed securities.

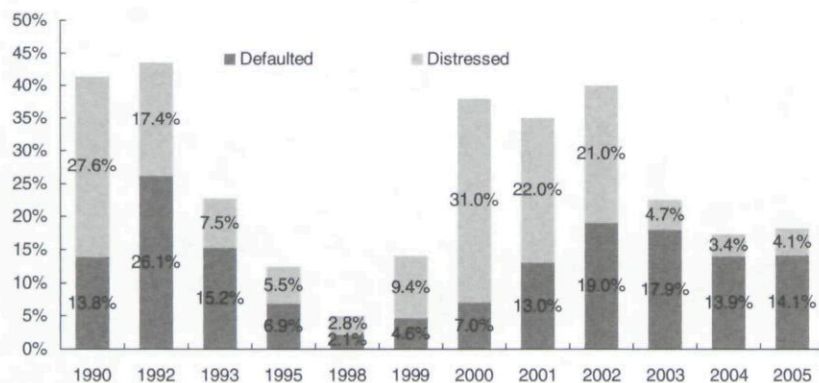
Some funds of funds, domestic pension and endowment funds, and foreign closed-end funds have adopted the strategy of selecting managers of distressed securities with different styles. In addition to diversifying across asset classes, these funds invest with managers of distressed securities who practice different strategies (for example,

active, passive, control, long-short, senior versus subordinate, midcaps).

We estimate that there are now over 160 U.S. investment institutions that specialize in distressed debt (Appendix B) and about three dozen in Europe

EXHIBIT 13

Distressed and Defaulted Debt as a Percentage of Total High-Yield Debt Market—1990-2005



Note: Public deals only.

Source: NYU Salomon Center, Credit and Debt Market Program and Citigroup estimates.

EXHIBIT 14

Estimated Face and Market Values of Defaulted and Distressed Debt

	Face Value (\$)			Market Value (\$)			Market/Face Ratio
	31 Dec 03	31 Dec 04	31 Dec 05	31 Dec 03	31 Dec 04	31 Dec 05	
Public Debt							
Defaulted	193.6	152.0	170.4 ^a	87.1	76.0	93.7	0.55
Distressed	50.5	36.6	49.3 ^b	32.8	23.8	34.5	0.70
Total Public	244.1	188.6	219.7	119.9	99.8	128.2	
Private Debt							
Defaulted	425.9	334.4	374.9 ^c	298.1	234.1	299.9 ^c	0.80
Distressed	111.1	80.6	108.5 ^c	94.4	68.5	97.6 ^c	0.90
Total Private	537.0	415.0	483.3	392.6	302.6	397.5	
Total Public and Private	781.1	603.6	703.0	512.5	402.4	525.7	

^aCalculated as: (2004 defaulted population) + (2005 defaults) — (2005 emergences).

^bBased on 4.75% of size of high-yield market (\$1,039 billion).

^cFor December 31, 2004, and December 31, 2005, we use a private-to-public ratio of 2.20.

Source: NYU Salomon Center.

(Appendix C). Our estimate is that these investment enterprises in the U.S. dedicated combined assets of between \$150 and \$200 billion under management, as of year-end 2005, to distressed debt and some equity investments of emerging companies. This is up by perhaps \$50 billion from the year previous.

PROPORTION AND SIZE OF THE MARKETS

The distressed and defaulted public debt proportion of the straight (non-convertible) high-yield and defaulted corporate debt markets in the United States at year-end 2005 represented about 18.2% of the total high-yield and

defaulted debt markets (\$1,091.5 billion), up somewhat from 17.3% in 2004 (Exhibit 13).

The distressed proportion of bonds yielding at least 1,000 b.p. over ten-year Treasuries was 4.1% (4.75% of just the high-yield market) as of year-end 2005. This level is lower than the 4.7% proportion in 2003 but higher than the 3.4% in 2004. While such a low proportion would generally mean low future one-year default rates, note that the 1999 default rate rose significantly to 4.15%, despite the very low distressed proportion in 1998.

The defaulted debt proportion as of year-end 2005 also increased to 14.1% from 13.9% one year earlier. This reflects the larger size of new 2005 defaults (\$36.2 billion) compared with emerging bonds from reorganization of \$17.8 billion. The defaulted bond proportion increased considerably in the last six months of 2005, when the dollar-denominated quarterly default rates surged.

The total of defaulted and distressed public and private debt increased in 2005 to just over \$700 billion (face value) and about \$525 billion (market value); see Exhibit 14. This includes \$170 billion (face value) of defaulted bonds still outstanding, up by almost \$20 billion from one year earlier, as emergences from Chapter 11 fell to about one-half of new defaults. Indeed, while 25 firms with a minimum of \$100 million in liabilities and with public debt emerged from Chapter 11 in 2005, accounting for \$17.8 billion, slightly

more much larger firms defaulted (34), most in the last two quarters of the year.

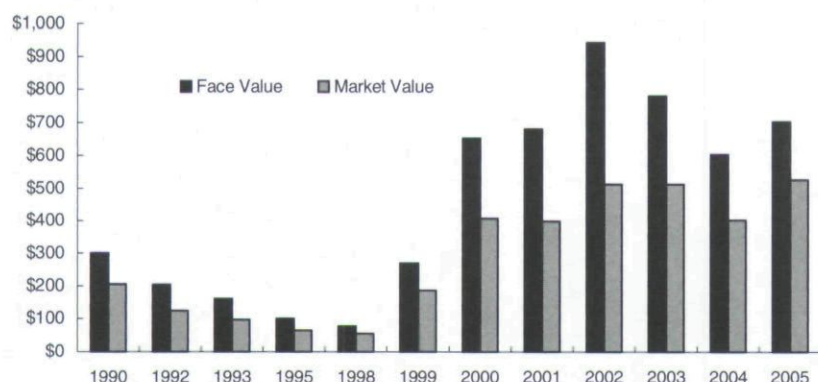
The distressed debt total increased by about \$13 billion (face value) as of year-end 2005. Finally, the market values of public and private defaulting securities increased considerably to about \$525 billion—an increase of over \$125 billion in just one year.

While the year-end 2005 face value total is still below the record 2002 level, the market value is now actually above the total in 2002 and at a record high amount, as Exhibit 15 makes quite clear.

We continue to use a 2.2 to 1.0 ratio of private-to-public debt to estimate the private debt totals. We expect to update our periodic study of this ratio shortly, and there are some indications that the ratio actually fell in 2005.

EXHIBIT 15

Size of Defaulted and Distressed Debt Market—1990-2005 (Dollars in Billions)



Source: Authors' calculations.

EXHIBIT 16

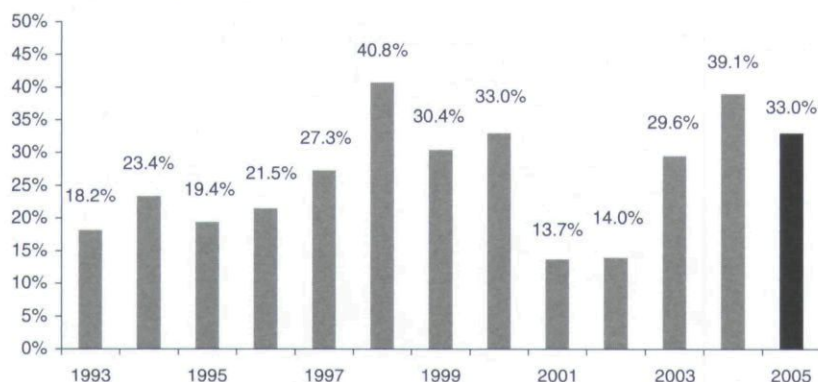
Actual and Forecasted High-Yield Market Size, Defaults, and Default Rates for 2005-2007 (Dollars in Billions)

	High-Yield Market	Default Rate (%)	Default Amount
2005	\$1,010.0*	3.00	\$30.30
2005 (actual)	1,073.0	3.37	36.20
2006	1,100.0	4.00	44.00
2007	1,210.0	5.00	60.50

Source: Fenn [2006].

EXHIBIT 17

New High-Yield Issues Rated B- or Below as a Percentage of New Issue Dollars



Source: Standard & Poor's.

Exhibit 14 reflects this ratio for 2003-2005. The current ratio is based on a sample of more than 150 bankruptcies in the three-year period 2002-2004. The ratio for years prior to 2003 and our estimates for the market in those

years are based on a lower private/public debt ratio.

FORECASTING DEFAULT RATES AND SIZE OF THE DISTRESSED AND DEFAULTED DEBT MARKET

Our forecast for the 2005 default rate was very close to the actual rate. By analyzing new issuance for the past ten years, by bond ratings, adjusted where possible for the issuing firms' bond rating equivalents based on our Z-score methodology (Altman and Hotchkiss [2005]) and then applying the mortality rate (Altman [1989]) to historical experience, we estimated that the 2005 default rate would be 3.0%. With a surge in the third and fourth quarters of 2005, the actual rate hit 3.37%.

For our 2006 forecast, based on new issuance credit quality from 1995 to 2005, we have predicted a continued rise in defaults, especially in the second half of the year, and we believe a 4.0% default rate overall is possible. It should be noted that the expected default rate implied by the year-end 2005 market yield spread over ten-year U.S. Treasuries (405 b.p.) implies a lower rate—perhaps about one-half of the 4.0% rate. While we are less sure that the default rate will continue to rise in 2006, we are more confident about increasing credit problems in 2007, when the rate of default could reach more than 5.0% (see Exhibit 16).

The extremely liberal credit standards currently set by market participants are worrisome. Indeed, as shown in Exhibit 17, the proportion of new high-yield bond issues (in dollars) with ratings B- or below remained extremely high in 2005 at 33% compared to an even higher percentage (39.1%) in 2004. And, the proportion of new issuance in 2005 rated CCC, CC, and C was at a record-high 17.4%, up from an already high 16.3% in 2004 (S&P data).

Our 2006-2007 forecasts use the mortality rate methodology and new issuance over the last decade. See the "Report on Defaults and Returns in the High-Yield Bond Market: 2005 in Review and Market Outlook" [2006] for

the latest update on mortality rates. These forecasts are not based on any forecasts of interest rates and GDP growth.

Given these forecasts, we expect the distressed and defaulted market to have grown in 2006 and certainly to grow in 2007. Because we expect the amount of defaults

to increase in the 2006–2007 period and the proportion of high-yield distressed bonds and loans to rise from their historically very low current levels, the distressed and defaulted public and private market could reach \$750 billion (face) and \$550 billion (market) by year-end 2006.

APPENDIX A

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%	

APPENDIX B

U.S. Distressed Debt Managers—2005

Abrams Capital	Gruss Asset Management L.P.	Redwood Capital
AEG	GSC Capital	Republic
Angelo, Gordon & Company	H.I.G.	Resolution Partners
Apollo Management	Hakcyon/Slika (Alan B.) Mgmt.	Restoration Capital Management
Appaloosa Management	Harvest Capital	Resurgence Corporate Fund
Ares Corporate Opportunities Fund	Helios Advisors	Salisbury
Ashmore Asian Recovery	Highbridge Capital Management	Sandell Asset Management
Avenue Capital Partners	Highland Capital	Satellite Asset Management
Basso Asset Management	Ivory Investment Management	Schultze Asset Management
Bay Harbour Advisors	JLL Partners	Scoggin Capital
Bayside Capital	JMB Capital	Scott's Cove Capital Mgmt. LLC
Beltway Capital	John A. Levin & Co.	Seneca Capital Investment Partnership
Bennett Management Company	K Capital Partners	Signature Capital Partners
Black Diamond	KD Distressed Capital	Silvergang
Blackport Capital Fund, LTD	King Street Advisors	Silverpoint Capital
Boone Capital Management	KPS Special Situations Fund	Spring Street
The Broe Companies	KS Distressed Debt	Stanfield Capital Management
Buckeye Capital Partners	Lampe Conway	Stairway Capital Advisors
Canyon Capital	Langley Management	Stark Investments
Cardinal Capital	Laurel Ridge Asset Management	Stonehill Capital
Carl Marks	Leucadia National Corporations	Strategic Value Partners
Carlyle Strategic Partners	Levco Debt Opportunities	Summit
Cargill Value Investment	Litespeed Partners	Sun Capital Partners, Inc.
Catlock Capital	Loeb Partners	Sunrise Capital Partners
Cerebrus Partners	Lonestar Partners LP	TA McKay & Co.
Chrysalis Capital Partners	LongAcre Capital Partners	Taconic Capital Partners
Citadel Investments	Longroad Asset Management	The Baupost Group
Cohanzyck Management	Marathon Capital LLC	Third Avenue Value Fund
Commonwealth	Mariner Investment Group	TPG Credit Management
Concordia Advisors	Mason Capital Management	Triage Capital
Contrarian Capital Management	MatlinPatterson Global Advisors	Trilogy Capital
Corsair	Mellon HBV Capital Management	Trust Company of the West
Cypress Management	MHR	Tumberry Capital
D.B. Zwirn Partners	Millennium	Tyndall Partners
D.E. Shaw	MJ Whitman Mgmt. Co.	Van Kampe
DALTON Investments	Moore Asian Recovery Fund	Varde Partners, Inc.
Davidson/Kempner (MH Davidson)	MSD Capital	W.L. Ross & Co.
DDJ Capital Management	Murray Capital	Wayland Fund
Deephaven Capital Management	MW Post	Wellspring Capital Partners
Delaware Street Capital	New Generation Advisers	Wexford Capital
Elliott Advisors	Oakhill	Whippoorwill Associates, Inc.
Endurance Capital	Oaktree Capital	William E. Simon & Sons
Deltec Recovery Fund	Och Ziff Friedheim	Woodside Management
Durham Asset Management	Owl Creek Capital	Xerion Partners
Eagle Rock Capital	Pacholder Associates, Inc.	York Capital
EOS Partners	Pacific Alternative Asset Management	
Epic Asset Management	Patriarch	
Fairfield Greenwich	Pegasus Investors	
Farallon Partners	Pequot Capital	
Forest Investment Management	Perry Partners	
Franklin Mutual Recovery	Peter Schoenfeld Asset Management	
Fortress Capital Corp.	Pine Creek	
GE Finance	Pinewood Capital Partners LLC	
Glenview Capital Management	Plainfield Asset Management	
Golden Capital	PMI	
Golden Tree LLC	PPM America	
Gracie Capital	Proprietary Trading of Market Makers	
Gramercy Capital	Quadrangle Group LLC	
Greenwich Capital	Questor Management	
Greywolf Capital	Radius Equity Partners	

APPENDIX C

U.S. Distressed Funds with European Offices

Cerebrus Partners
Citadel Investments
Elliott Advisors
Fortress Capital Corp
Highbridge Capital Management
Lonestar Partners LP
Millennium
Oaktree Capital
Och Ziff Friedheim
Peter Schoenfeld Asset Management
Strategic Value Partners
TPG Credit Management

European Distressed Debt Managers 2005

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

ENDNOTES

The authors appreciate the assistance of Pedro Campos, Brent Pasternack, and Lourdes C. Tanglao of the NYU Salomon Center and the many investors and institutions who provided price quotations and other data. A special thanks to the various rating agencies, and to New Generation Research for helpful data.

*This index, originally developed in "Investing in Distressed Securities" [1990], is maintained and published on a monthly basis at the NYU Salomon Center of the Leonard N. Stern School of Business. It is available, by subscription. For information, call (212)998-0701.

REFERENCES

- Altman, E. I. (1990) "Investing in Distressed Securities." Altman Foothill Report, Los Angeles.
- Altman, E. I. "Corporate Bond Mortality and Performance." *Journal of Finance*, September 1989.
- Altman, E. I., and A. Eberhart. "Do Seniority Provisions Protect Bondholders' Investments?" *The Journal of Portfolio Management*, Summer 1994.
- Altman, E. I., A. Gande, and A. Saunders. "The Informational Efficiency of Loans Versus Bonds: Evidence from Secondary Market Prices." Working paper, NYU Finance Department, 2004.
- Altman, E. I., and Edith Hotchkiss. *Corporate Financial Distress and Bankruptcy*, 3rd ed. New York: John Wiley & Sons, 2005.
- Brand, L., and R. Behar. "Recoveries on Defaulted Bonds Tied to Security Ratings." *S&P's Credit Week*, February 2000.
- Fenn, J. "Altman Report on Defaults and Returns in the High-Yield Bond Market." Citigroup, US Fixed Income Strategy, February 21, 2006.

To order reprints of this article, please contact Dewey Palmieri at dpalmieri@iijournals.com or 212-224-3675.

©Euromoney Institutional Investor PLC. This material must be used for the customer's internal business use only and a maximum of ten (10) hard copy print-outs may be made. No further copying or transmission of this material is allowed without the express permission of Euromoney Institutional Investor PLC. Copyright of *Journal of Portfolio Management* is the property of Euromoney Publications PLC and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.

The most recent two editions of this title are only ever available at <http://www.euromoneyplc.com>