New York University Salomon Center
Leonard N. Stern School of Business

Special Report on

The Investment Performance and Market Dynamics of Defaulted Bonds and Bank Loans:
2010 Review and 2011 Outlook

By

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and

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Acknowledgments

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Executive Summary

Defaulted debt securities ended 2010 with sound positive annual returns that were about two times the historical average; albeit far lower than last year's record-setting gains. The gain on the Combined Altman-Kuehne Index was 17.70%. This long-only, U.S. and Canadian debt index was paced by a strong performance from defaulted bonds, though defaulted loans also experienced above average returns. The Combined Index return was slightly higher than that of both Citigroup's High-Yield Bond Index (+14.32%) and the S&P 500 Stock Index (+15.06%).

The Altman-Kuehne Defaulted Bond Index performed well in 2010, though returns were far lower than those of one year earlier (+96.42%). The long-only defaulted bond index gained 25.76% in 2010. Defaulted bank loans were less productive, with the Altman-Kuehne Defaulted Loan Index posting an annual gain of 9.98%, once again lower than 2009's annual return of 32.80%.

The market-to-face-value ratio of the defaulted *bond* index fell slightly in 2010 to 31%, a two percentage point decrease from 2009's year-end level (33%). This decrease was driven by the exit from the index, over the course of the year, of several issues which had been pricing at or over par for some time, and the entrance of lower-priced defaults through 2010. The market-to-face value of defaulted *bank loans* fell to 52% from 59% in 2010 for similar reasons.

In stark contrast to the jump in 2009 to near-record levels, the dollar-denominated default rate on high-yield bonds dropped to its lowest level since 2007, decreasing from 10.77% in 2009 to 1.13% in 2010. Default rates on leveraged loans also decreased accordingly with an issuer-based default rate of 2.86%, and 1.87% based on amount of issuance (from 8.07% and 9.61%, respectively), according to S&P's LCD compilations. In addition to a decrease in corporate defaults, there was also a significant dip in the distressed ratio as well as higher amounts of emergences from reorganization, causing the size of the face value of public and private distressed and defaulted debt to drop by 35% from $1.6 trillion at the end of 2009 to $1.1 trillion. The estimated market value dollar amount fell by about 41% from $1.02 trillion at the end of 2009 to $597 billion one year later.

As for distressed debt hedge-fund indexes' performance, 2010 was also a solid year, almost as much so as our long-only, 100% invested defaulted debt indexes, reported above. These hedge fund indexes reflect actual performance averages of samples of hedge funds. The average performance for four of these indexes in 2010 was +13.55%. These indexes are based on returns after manager fees while our price performance indexes are not.

Measuring and Monitoring Performance of Defaulted Bonds

Defaulted Bond Index

The Altman-Kuehne Defaulted Bond Index was developed in 1990 for the purpose of measuring and monitoring the performance of defaulted debt securities.[1] This work was complemented two years later by an analysis of the distressed bank loan market.[2] The performance statistics on bonds goes back to 1987, and a later time series on defaulted loans was originated in 1996. As of December 31, 2010, the number of issues in our defaulted bond index was 53, down significantly from the 91 at year-end 2009, and about one-quarter the number of its previous highs in the early 1990s and 2001 (Figure 1). The face value of the defaulted bonds that comprised this index decreased from its level in 2009 by 42%, to $26.4 billion, and the market value decreased by an estimated 45% to $8.3 billion.

There were 16 firms included in the defaulted bond index at year-end 2010, about half the number of 2009. This tends to point to a smaller number of entrances and more exits amongst defaulted companies. It should be noted that the number and amount of defaulted bond issues is considerably greater than those listed in Figure 1 since our index totals are limited to any one issuer comprising no more than 10% of the index's total market value, and we only include issues for which we find consistent monthly quotes.

Combined with the lower prices of newly defaulted bonds in 2010, the market value of our index decreased by almost $7 billion, and the market-to-face value ratio fell slightly to 31%, a two percentage point decrease over the prior year.

[1] This index, originally developed in "Investing in Distressed Securities," E. Altman, The Foothill Group, 1990, is maintained and published on a monthly basis by the NYU Salomon Center of the Leonard N. Stern School of Business. It is available by subscription from the Salomon Center, (212) 998-0701 or (212) 998-0709.

[2] E. Altman (1992), "The Market for Distressed Securities and Bank Loans," The Foothill Group, Los Angeles, CA.

Figure 1. Size of the Altman-Kuehne Defaulted Bond Index, 1987–2010

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
2006	85	36	31.2	23.3	0.75
2007	48	17	13.8	6.3	0.46
2008	77	28	29.6	4.5	0.15
2009	91	34	45.5	15.1	0.33
2010	**53**	**16**	**26.4**	**8.3**	**0.31**

Source: NYU Salomon Center.

Defaulted Bank Loan Index

Bank loans — another major market in defaulted debt instruments — had a similar performance experience to that of bonds in 2010, with even more drastic decreases in the number of issues, face values and market values. As can be seen in Figure 2, the face value of the loan facilities that comprised the index in 2010 dropped to one-fifth of the value in 2009, with a similar decrease in market values, from $34.1 billion to $5.9 billion. The market-to-face value ratio fell by seven percentage points to 52% by year-end 2010. The face value of this Index dropped to a level last seen in 2006, and the market value last seen in 1999.

Figure 2. Size of the Altman-Kuehne Defaulted Bank Loan Index, 1995–2010 (Dollars in Billions)

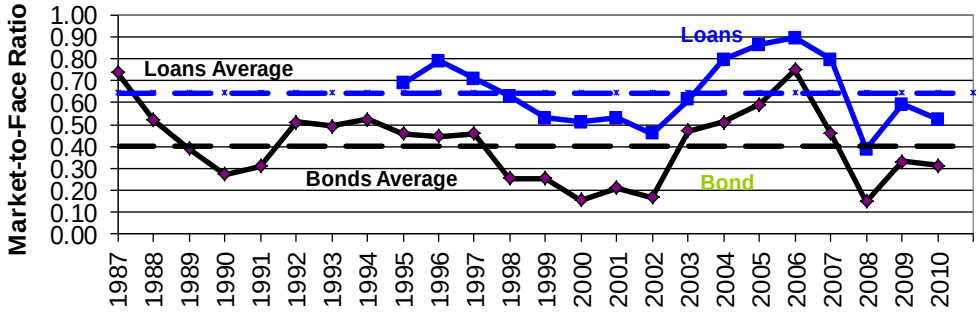
Year-End	Number of Issues	Number of Firms	Face Value ($ Billions)	Market Value ($ Billions)	Market/ Face Ratio
1995	17	14	2.9	2.0	0.69
1996	23	22	4.2	3.3	0.79
1997	18	15	3.4	2.4	0.71
1998	15	13	3.0	1.9	0.63
1999	45	23	12.9	6.8	0.53
2000	100	39	26.9	13.6	0.51
2001	141	56	44.7	23.8	0.53
2002	64	51	37.7	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
2006	27	23	11.2	10.0	0.89
2007	31	13	13.0	10.4	0.79
2008	71	31	27.5	10.7	0.39
2009	67	27	57.6	34.1	0.59
2010	**20**	**12**	**11.3**	**5.9**	**0.52**

Source: NYU Salomon Center

Market-to-Face-Value Ratios

Figure 3 shows the time series trend in the market-to-face value ratios of defaulted bonds and bank loans. In 2010, both the bond and loan indexes' ratios dropped slightly from the prior year to widen the gap between the current market-to-face value and their historical averages. As of year-end 2010, the market-to-face value ratio for defaulted bonds was 31%, nine percentage points lower than the historical average of 40%. Similarly, the market-to-face value ratio for defaulted loans was 12 percentage points lower than the historical average (64%) at 52%. This is the third year in a row that the Index levels have been below historical averages. The last time we saw such a string of below average levels was 1998-2002.

Figure 3. Altman-Kuehne Default Debt Indexes — Market-to-Face Value Ratios, Annual 1987–2010



Note: The loans median market-to-face value is 0.62 and average market-to-face value is 0.64. Bonds median market-to-face value is 0.45 and the average market-to-face value is 0.40.
Sources: Figures 1 and 2, NYU Salomon Center.

Performance Measurement

Our indexes include the securities of firms in different stages of reorganization — either bankruptcy or restructuring. We calculate the returns for the index using data compiled just after default to the point when the bankrupt firm emerges from Chapter 11, is liquidated, or until the default is "cured" or resolved through an exchange. The bond index includes issues of all seniorities, from senior-secured to junior unsecured debt. The return history shows that seniority of the issue is an extremely important characteristic of the performance of defaulted securities over specific periods, whether from issuance to emergence or from default to emergence (see, for example, Altman and Eberhart (1994)[3].

Our indexes do not include convertible or non-US and non-Canadian company issues, nor do they include distressed but not defaulted securities or distressed exchange securities. The performance measure is based on a fully invested, long-only strategy. Returns are calculated from individual bond and bank loan price movements; they are not based on average performance by managers. Returns are gross returns and do not reflect manager fees and expenses. There are, however, several distressed debt hedge fund indexes that reflect a sample of investment firms' performances (discussed later in this report).

2010 Defaulted Bond Performance

The Altman-Kuehne Index of Defaulted Bonds performed well in 2010, increasing by 25.76%, more than twice the index's historical arithmetic average. The average arithmetic annual rate of return on our index increased by 59bp to 12.23% (Figure 4). It is now 233bp more than the average annual performance of US high-yield bonds over the same period (1987–2010) and 91bp more than the S&P 500 (dividends reinvested). However, the compound average annual rate of return is considerably lower, reflecting its time series negative performance in nine of the 24 years in our sample period. The entire time series of returns in these three indexes is shown in Figure 5. Using the time series as a basis of comparison, the stock market slightly outperformed high-yield bonds, which outperformed defaulted bonds, over the last 24 years.

The volatility of the defaulted bond index is considerably greater than either high-yield bonds or common stocks when measured on an annual basis, but only slightly greater than common stocks, when measured on a monthly basis. No doubt, the "calming" influence of coupon payments on high-yield bonds is a major reason why that index's volatility measure (both annual and monthly) is considerably below those of defaulted bonds and common stocks. Indeed, defaulted bonds are "no-yield" bonds since they trade "flat." Still, as we will show at a later point, this high relative volatility of defaulted bonds is somewhat mitigated by its low correlation with most other asset classes. This mitigation factor has diminished of late, however.

[3] Generally, the higher the seniority, the better the performance. See E. Altman and A. Eberhart (1994), "Do Security Provisions Protect Bondholders' Investments?", *Journal of Portfolio Management*, Summer.

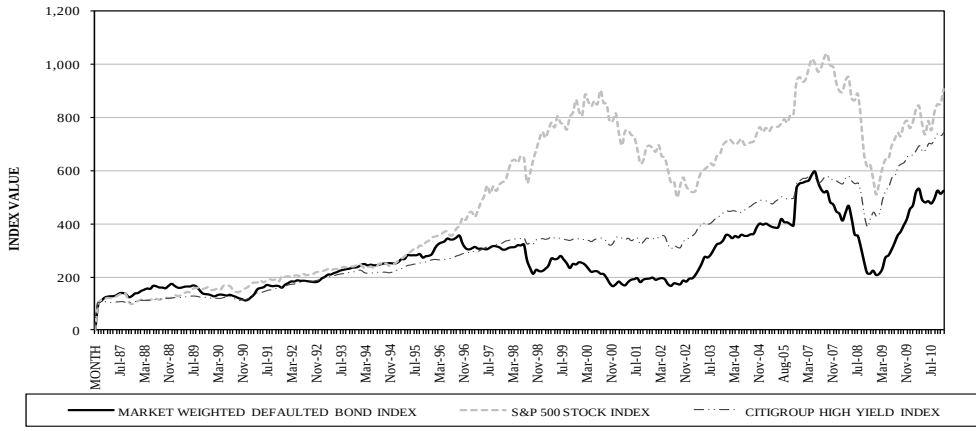
From a return/risk standpoint, the average annual return to annual standard deviation ratio favored the high-yield bond market and the stock market. Using arithmetic average returns, the ratios are 0.61 for both High-Yield Bonds and the S&P 500 and 0.36 for Defaulted Bonds. On a monthly return basis, the Defaulted Bond Index performs relatively better, as does the High-Yield Bond Index (which performs best).

Figure 4. Altman-Kuehne Defaulted Bond Index Comparison of Returns, 1987–2010

Year	Altman-Kuehne 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
2006	35.62	15.80	11.85
2007	-11.53	5.50	1.84
2008	-55.09	-37.00	-25.91
2009	96.42	26.46	55.19
2010	**25.76**	**15.06**	**14.32**
Arithmetic Average (Annual) Rate, 1987–2010	**12.23**	**11.32**	**9.90**
Standard Deviation	**34.11**	**18.61**	**16.19**
Compounded Average (Annual) Rate, 1987–2010	**7.15**	**9.62**	**8.80**
Return/Standard Deviation Ratio	**0.36**	**0.61**	**0.61**
Arithmetic Average (Monthly) Rate, 1987–2010	**0.70**	**0.87**	**0.73**
Standard Deviation	**4.85**	**4.56**	**2.57**
Compounded Average (Monthly) Rate, 1987–2010	**0.59**	**0.77**	**0.71**
Return/Standard Deviation Ratio	**0.14**	**0.19**	**0.28**

Sources: NYU Salomon Center, Standard & Poor's, and Citi.

Figure 5. Defaulted Bond, Stock, and High Yield Bond Indexes, Dec 86–Dec 10



Source: NYU Salomon Center.

Defaulted Bank Loan Performance

The Defaulted Bank Loan Index also performed solidly, with an annual gain in 2010 of 9.98%, five percentage points higher than its historical average of 4.98% (Figure 6). This average annual return rose by 35bp from 4.63% in 2009. However, the historical average annual return over the 15-year time series compares poorly to the S&P 500 Index (8.94%) and high-yield bonds (8.59%). Again, our compound average annual returns are lower than the arithmetic averages by a wide margin.

The volatility of the Defaulted Bank Loan Index compares favorably with common stocks based on both annual and monthly returns (about a 3.1% lower standard deviation based on annual returns compared to common stocks). The volatility of defaulted loans in comparison to high-yield bonds was similar, with only a 7bp difference between the two. Some of our defaulted loans continue to pay interest each month, even in the post-Chapter 11 petition period. In general, price changes are less volatile than those of lower-priority bonds. Again, like with Defaulted Bonds, the average returns to standard deviation ratios favor common stocks and High-Yield Bonds over Defaulted Loans, with High-Yield Bonds the clear winner based on both annual average and monthly average measures.

Figure 6. Altman-NYU Salomon Center Defaulted Bank Loan Index Versus S&P 500 and Citigroup High-Yield Market Index — Comparison of Returns, 1996–2010

Year	Altman-Kuehne 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
2006	4.35	15.80	11.85
2007	2.27	5.50	1.84
2008	-43.11	-37.00	-25.91
2009	32.80	26.46	55.19
2010	**9.98**	**15.06**	**14.32**
Arithmetic Average (Annual) Rate, 1996–2010	**4.98**	**8.94**	**8.59**
Standard Deviation	**17.66**	**20.73**	**17.73**
Compounded Average (Annual) Rate, 1996–2010	**3.32**	**6.82**	**7.30**
Return/Standard Deviation Ratio	**0.28**	**0.43**	**0.48**
Arithmetic Average (Monthly) Rate, 1996–2010	**0.33**	**0.66**	**0.63**
Standard Deviation	**3.28**	**4.73**	**2.92**
Compounded Average (Monthly) Rate, 1996–2010	**0.29**	**0.55**	**0.59**
Return/Standard Deviation Ratio	**0.10**	**0.14**	**0.22**

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

Winners and Losers in 2010

There were several spectacular positive performing bonds in 2010 as well as some almost equally spectacular negative performers (Figure 7). The two *best* performing bonds had returns of 900%, though we must note that the beginning of the year prices on these top two issues were mere pennies or fractions of face value. Loan recoveries did not swing quite as far in 2010 with the top performing loan recording an 89.5% return in one year.

To be fair, Figure 7 lists only bonds and loans that were in our indexes for the entire year, and each individual category shows only one bond or loan from a company, although several firms had similar performances amongst its many securities. All industry sectors appeared to be continuing to recover from the credit meltdown and ensuing recession.

Colonial BancGroup and Lehman Brothers appear on both the "best and "worst" performers' lists for bonds, while Tribune Co.'s loans performed likewise. Capmark Financial is on the best performers' list for both bonds and loans, reflecting the small number of eligible bonds and loans for full-year performance.

Figure 7. Top- and Bottom-Performing Defaulted Bonds and Loans, 2010

Top Three Bonds	Coupon (%)	Maturity	Return (%)
Colonial BancGroup, Inc.	6.4	12/01/2015	900.0
Lehman Brothers Holdings, Inc.	6.5	7/19/2017	900.0
Capmark Financial Group, Inc.	6.3	5/10/2017	91.7

Bottom Three Bonds	Coupon (%)	Maturity	Return (%)
TOUSA, Inc.	10.4	7/01/2012	-100.0
Lehman Brothers Holdings, Inc.	6.9	7/17/2037	-83.3
Colonial BancGroup, Inc.	9.4	6/01/2011	-50.0

Top Three Loans	Facility	Return (%)
Tribune Co.	Bridge	89.5
Capmark Financial Group, Inc.	Revolver	60.2
IAP Worldwide Services, Inc.	Term – 2nd Lien	47.9

Bottom Three Loans	Facility	Return (%)
Fontainbleau Las Vegas.	Term T1	-43.2
Fairpoint Communications, Inc.	Term B	-11.5
Tribune Co.	Revolver	12.4

Source: NYU Salomon Center.

Combined Bond and Bank Loan Index

Our market-weighted combined defaulted debt index was up by 17.70% in 2010, and now shows an average annual arithmetic rate of return of 7.64% for 1996–2010, up about 72bp from last year's annual average return (Figure 8). The average annual return during this 15-year period was still below that of high-yield bonds (8.59%) and the return on common stocks (8.95%). However, the 2010 performance was slightly above the performances of both high-yield bonds (+14.32%) and common stocks (+15.06%).

The weights for the combined index as of year-end 2010 were 42% for loans versus 58% for bonds, compared to 69% loans and 31% bonds in 2009. This underscores the fact that even though both debt classes performed well, bonds fared significantly better. The annual volatility of the combined index of defaulted bonds and loans was slightly higher than common stocks, but eight percentage points higher than that of high-yield bonds. Based on monthly returns, however, our combined index had lower volatility than common stocks.

Figure 8. Combined Altman-NYU Salomon Center Defaulted Public Bond and Bank Loan Index Comparison of Returns, 1996–2010

Year	Altman-Kuehne 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
2006	23.40	15.80	11.85
2007	-3.30	5.58	1.84
2008	-47.52	-37.00	-25.91
2009	55.99	26.46	55.19
2010	**17.70**	**15.06**	**14.32**
Arithmetic Average (Annual) Rate, 1996–2010	**7.64**	**8.95**	**8.59**
Standard Deviation	**25.52**	**20.73**	**17.73**
Compounded Average (Annual) Rate, 1996–2010	**3.83**	**6.82**	**7.30**
Arithmetic Average (Monthly) Rate, 1996–2010	**0.43**	**0.64**	**0.63**
Standard Deviation	**3.80**	**4.73**	**2.93**
Compounded Average (Monthly) Rate, 1996–2010	**0.35**	**0.52**	**0.59**

Sources: NYU-Salomon Center, Standard & Poor's, and Citi.

Performance Comparison with Other Distressed Debt Indexes

We compare our index returns with at least five other "distressed" debt indexes. Three of these (Hennessey, HFR, and Van hedge) are indexes based on average manager performance, while the Moody's index is based only on bankrupt bonds, and Dow Jones/Credit Suisse's is based on defaulted bonds. All of the manager-based indexes underperformed both our combined and defaulted bond indexes in 2010, with the average performance ranging between 10.26% (Dow Jones/Credit Suisse) and 16.3% (Van Hedge) (see Figure 9). Keep in mind that the manager-based indexes incorporate all strategies of distressed hedge funds, including short sales, high-yield bonds (especially those selling at discounts), equities of Chapter 11 emerging firms, international securities, and more. The returns to the funds are after transaction costs and fees to the manager. The average performance of these four hedge-fund-manager indexes in 2010 was 13.55%.

Figure 9. Hedge Fund Distressed Debt Index Returns, 2003–2010

Calendar Year	Dow Jones/ Credit Suisse	Hennessee	HFR	Van Hedge	Altman-Kuehne Combined
2003	25.12%	26.79%	29.58%	27.42%	49.30%
2004	15.60%	18.98%	18.89%	18.19%	15.14%
2005	11.75%	9.71%	8.25%	9.34%	1.73%
2006	15.58%	15.78%	15.95%	15.33%	23.38%
2007	8.28%	8.31%	5.07%	7.37%	-3.30%
2008	-20.48%	-29.28%	-25.21%	-21.05%	-47.52%
2009	20.95%	42.97%	28.54%	24.69%	55.99%
2010	**10.26%**	**15.47%**	**12.12%**	**16.35%**	**17.70%**

Source: Bloomberg and NYU Salomon Center.

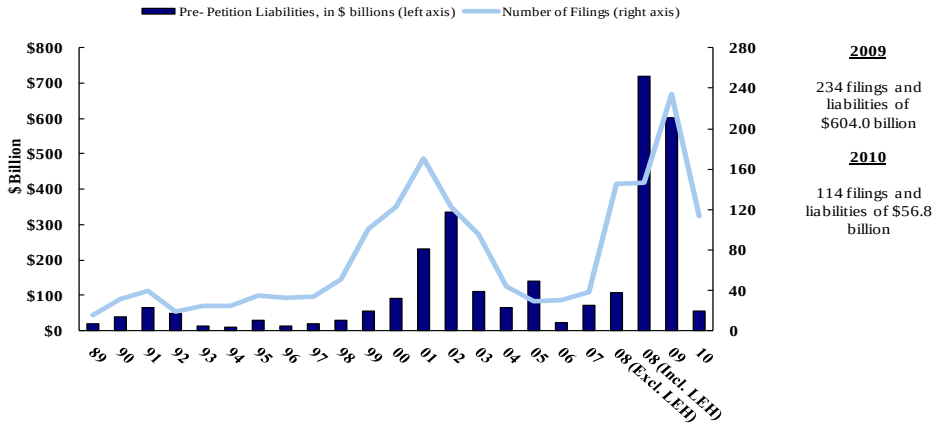
Moody's bankrupt bond index had a return of approximately 23% in 2010, while Credit Suisse's defaulted bond index, a breakout of the high-yield index, posted returns of 19.5%. Recall, the Altman-Kuehne Defaulted Bond Index was up 25.76%. Credit Suisse's defaulted loan index, a breakout of the leveraged loan index, posted gains of 8.86% (our Loan index was up by 9.98%).

Bankruptcies and Defaults

One hundred fourteen companies with liabilities of more than $100 million filed for Chapter 11 in 2010, slightly less than half the number of companies that filed in 2009 (Figure 10). The amount of liabilities decreased substantially to about $56 billion from $604 billion in 2009. The number of mega-bankruptcies with liabilities greater than $1 billion decreased seventy percent to 14 from 50 last year. The latter was the highest annual number ever.

The default rate on high-yield bonds registered 1.13% in 2010, decreasing from a near record-high 10.74% in 2009, with $13.8 billion in new bond defaults (Figure 11). The default rate reached its lowest point since 2007, prior to the credit crisis.

Figure 10. Liabilities[a] of Public Companies Filing for Chapter 11 Protection, 1989–2010



[a] Minimum $100 million in liabilities.
Source: NYU Salomon Center Bankruptcy Database.

Figure 11. Historical Default Rates (Straight Bonds Only Excluding Defaulted Issues From Par Value Outstanding), 1971–2010 (US Dollars in Millions)

Year	Par Value Outstanding[a] ($)	Par Value Defaults ($)	Default Rates (%)	Year	Par Value Outstanding[a] ($)	Par Value Defaults ($)	Default Rates (%)
2010	1,221,569	13,809	1.130	1984	40,939	344	0.840
2009	1.152.952	124,130	10.766	1983	27,492	301	1.095
2008	1,091,000	50,763	4.653	1982	18,109	577	3.186
2007	1,075,400	5,473	0.509	1981	17,115	27	0.158
2006	993,600	7,559	0.761	1980	14,935	224	1.500
2005	1,073,000	36,209	3.375	1979	10,356	20	0.193
2004	933,100	11,657	1.249	1978	8,946	119	1.330
2003	825,000	38,451	4.661	1977	8,157	381	4.671
2002	757,000	96,858	12.795	1976	7,735	30	0.388
2001	649,000	63,609	9.801	1975	7,471	204	2.731
2000	597,200	30,295	5.073	1974	10,894	123	1.129
1999	567,400	23,532	4.147	1973	7,824	49	0.626
1998	465,500	7,464	1.603	1972	6,928	193	2.786
1997	335,400	4,200	1.252	1971	6,602	82	1.242
1996	271,000	3,336	1.231				
1995	240,000	4,551	1.896				Std Dev (%)
1994	235,000	3,418	1.454	**Arithmetic Average Default Rate**			
1993	206,907	2,287	1.105	1971–2010		3.277	3.204
1992	163,000	5,545	3.402	1978–2010		3.561	3.399
1991	183,600	18,862	10.273	1985–2010		4.200	3.535
1990	181,000	18,354	10.140	**Weighted Average Default Rate[b]**			
1989	189,258	8,110	4.285	1971–2010		4.254	
1988	148,187	3,944	2.662	1978–2010		4.264	
1987	129,557	7,486	5.778	1985–2010		4.294	
1986	90,243	3,156	3.497	**Median Annual Default Rate**			
1985	58,088	992	1.708	1971–2010		1.802	

[a] As of midyear. [b] Weighted by par value outstanding for each year.
Sources: Authors' compilations, NYU Salomon Center Database.

Recovery Rates on Defaulted Debt

The weighted-average recovery rate (based on market prices just after defaults) on high-yield bond defaults in 2010 rose from 36.1% in 2009 to 44.6% by the end of the

year. This is slightly above the historic average (1978-2010) of 44.8%, and the highest recovery rate since 2007.

Due to the fact that 36% of all defaults, based on dollar amount, occurred due to a distressed exchange in 2010, the recovery rate was affected by these transactions more so than in 2009. DE recoveries are generally higher than typical defaults. Without DE defaults, the 2010 recovery rate was only 29.9%, 1,470bp lower than the recovery rate including all defaults! This latter rate is more relevant to our defaulted debt indexes because distressed exchange bonds do not enter our indexes.

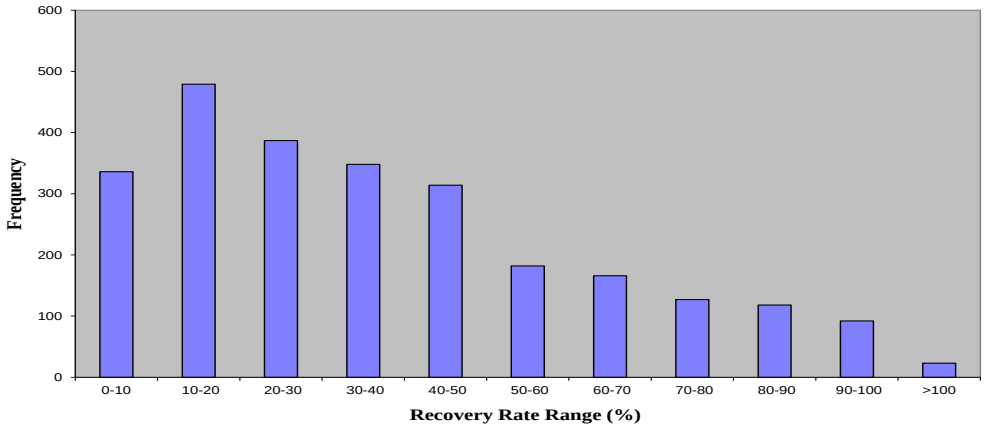
Figure 12 shows the frequency distribution of recovery rates across all seniority and industry classifications for more than 2,500 bond defaults during 1971–2010. Note that the modal value is actually only 10–20%, even though our historical average recovery rate range is 35–40%. The vast majority falls in the 0–50% range. For a more complete treatment and discussion of bond recovery rates, see our companion report on defaults in the high-yield bond market.[4]

The weighted-average recovery rate on defaulted loans was only 52.5% in 2010, compared to the historical average of 64.4%. The frequency distribution of default recovery rates was quite different for corporate loans (Figure 13) than we saw earlier for defaulted bonds (Figure 12). Based on a smaller but still relevant sample of 547 loan defaults during 1996–2010, we can observe loan recoveries based on the price one month after default. The distribution of loan recoveries in 2010 was skewed more toward the higher end of the default distribution, with the bulk in the 50-100% range, the opposite as is the case with bonds. The most frequent decile was 80-90%. The higher average recovery rate on defaulted loans compared to bonds reflects its senior, and often secured, status. The shorter measurement period is also more favorable. The standard deviation of loan recoveries was about 27%, comparable to the same for bonds (25%). Relative to the means, however, the standard deviation divided by mean recoveries for loans was 0.42, compared to 0.62 for bonds, indicative of the higher variability of bond default recoveries[5].

[4] E. Altman and B. Kuehne, "NYU Salomon Center Special Report on Defaults and Returns in the High-Yield and Distressed Debt Market: The Year 2010 in Review and Outlook", *NYU Salomon Center*, February 2011; also published under: E. Altman and B. Kuehne, " Defaults and Returns in the High-Yield and Distressed Debt Market: The Year 2010 in Review and Outlook", *Paulson & Co, Inc.*, February 4, 2011

[5] This statistic is known as the coefficient of variation and is a relevant comparative statistic for populations with different mean values.

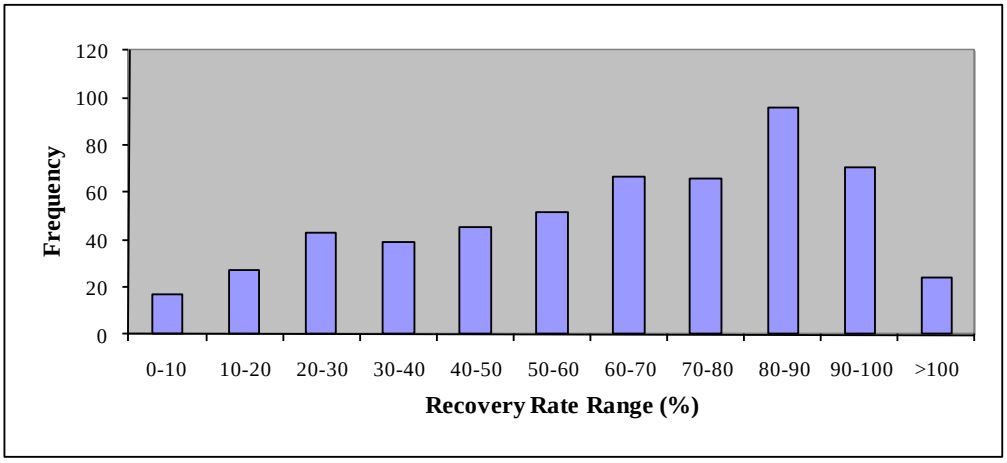
Figure 12. Corporate Bond Default Recovery Rate Frequency (Based on Number of Issues 1971–2010)[a]



[a] Number of Observations = 2,572.

Source: NYU Salomon Center Default Database.

Figure 13. Loan Default Recovery Rate Frequency (Based on Number of Issues 1996–2010)[a]



[a] Number of Observations = 547. Source: NYU Salomon Center.

Defaulted Debt Performance versus Default Rates

We have sometimes commented upon the relatively very high returns on defaulted bonds and loans in the year(s) following a surge in defaults in one or more prior years. The best example of this is the huge outperformance on defaulted bonds (84.9%) and loans (27.5%) in 2003, following the record default rate year of 2002 (12.8%). Something similar occurred in 1991, when defaulted bonds returned 43.1%, although the high default rate year of 1990 was followed by an equally high rate in 1991, mostly in the early months of that year.

In 2009, however, we observed an out-performance on defaulted bonds and bank loans which coincided with a huge year in defaults. Actually, 2009 had two distinct periods. In the first several months, defaults surged and returns were poor. In the

second two-thirds of the year, defaults dropped dramatically (especially in the second half, excluding November) and returns surged. So, in effect, a strong recovery in the market did follow a peak in defaults, only both occurred in the same calendar year. The same phenomenon occurred in 1991.

In 2010, we observed above average returns following a very high year in default rates in 2009 and an average year in 2008. The latter year was an extremely stressed one economically, but defaults only picked up toward the end of the year.

We can examine the relationship between default rates and either concurrent or subsequent returns on defaulted bonds, bank loans, and our combined index in Figure 14. We ran univariate regressions where the independent variable is the default rate and the dependent variable is either the defaulted bond, loan, or combined index performance. It appears that the strongest relationship between default rates and subsequent returns is when the default rate is from one to two years prior to the performance year. There was very little relationship found over the period 1987-2010 between default rates and returns measured on a concurrent basis.

Figure 14. Regression (Correlation) Analysis of Defaulted Debt Index Returns Versus Default Rates (1997-2010)

Panel A. Defaulted Debt (t+1) Versus Default Rate (t)	
Defaulted Bonds (t+1) =	-0.14 + 5.64 (Default Rate (t))
Correlation (y/x) =	54.2%
R2 =	29.4%
t-test =	2.23 (.05 level)
Defaulted Loans (t+1) =	-0.06 + 2.35 (Default Rate (t))
Correlation (y/x) =	52.7%
R2 =	27.8%
t-test =	2.15 (.05 level)
Combined Index (t+1) =	-0.09 + 3.67 (Default Rate (t))
Correlation (y/x) =	55.6%
R2 =	31.0%
t-test =	2.32 (.05 level)
Panel B. Defaulted Debt (t+2) Versus Default Rate (t)	
Defaulted Bonds (t+2) =	-0.01 + 3.37 (Default Rate (t))
Correlation (y/x) =	28.9%
R2 =	8.3%
t-test =	1.00 (not significant)
Defaulted Loans (t+2) =	-0.04 + 2.04 (Default Rate (t))
Correlation (y/x) =	40.8%
R2 =	16.6%
t-test =	1.48 (not significant)
Combined Index (t+2) =	-0.02 + 2.50 (Default Rate (t))
Correlation (y/x) =	33.8%
R2 =	11.4%
t-test =	1.19 (not significant)
Panel C. Defaulted Debt (t) Versus Default Rate (t)	
Defaulted Bonds (t) =	0.01 + 2.27 (Default Rate (t))
Correlation (y/x) =	22.3%
R2 =	5.0%
t-test =	0.83 (.not significant)
Defaulted Loans (t) =	0.02 + 0.81 (Default Rate (t))
Correlation (y/x) =	18.0%
R2 =	3.2%
t-test =	0.66 (.not significant)
Combined Index (t) =	0.02 + 1.22 (Default Rate (t))
Correlation (y/x) =	18.9%
R2 =	3.6%
t-test =	0.69 (.not significant)

Source: NYU Salomon Center.

We find that the correlation between the default rate on high-yield bonds and the following year's Combined Index of Defaulted Bonds and Bank Loans was quite high, at close to 56% (Panel A, bottom). Indeed, the default rate explained about 31% of the variance in the combined index's next year's performance. Similar results can be seen with the default rate and the bond and the bank loan performance association. While our time series is only 14 years, the t-statistic (2.32), which measures whether the independent variable (default rate) is statistically meaningful, was significant at the 5% level of confidence.

It is important to note that the coincident relationship between default rates and defaulted debt returns shows little association (R^2 = 3.6%) for the combined index, 3.2% for the defaulted bank loans, and 5.0% for the defaulted bonds; see panel C in Figure 14). As noted above, however, our regressions did not pick up the possibility of an intra-year correlation between defaults and subsequent returns on defaulted bonds and bank loans.

Diversification: Management Styles and Return Correlations

Return Correlations

We have often noted the attractive diversification strategies with distressed debt and most other asset classes. Several domestic pension, hedge fund, and foreign investors have used this strategy by allocating a portion of their total investments to distressed debt money managers. In addition, Fund of Funds, which invest in alternative investment managers, now typically consider distressed debt an important asset class. The principal idea behind this strategy is that returns from distressed debt portfolios have a relatively low correlation with returns from most other asset classes. This notion is being challenged, however, in recent years (see below).

In addition, managers have carved out distinctive styles within the distressed space (for example, passive, active, control or near control, long-short, arbitrage, and mid-caps, to name a few). We estimate that there are over 200 investment institutions in the United States that specialize in distressed securities.

Figure 15 shows the correlations between monthly returns on the Altman-Kuehne Defaulted Bond Index and two other risky asset classes, as well as 10-Yr Treasury Bonds for the 24-year period of 1987–2010. During this period, the correlation of defaulted bond returns with the S&P 500 was 41.13%, 67.27% with Citigroup's High Yield Bonds, and -27.90%, with 10-Yr Treasury Bonds.

Figure 15. Correlation of Altman-Kuehne Monthly Indexes of Defaulted Bonds With Other Securities Indexes, 1987–2010

	Altman-Kuehne Defaulted Bond Index (%)	S&P 500 (%)	Citi High-Yield Bond Index (%)	10-Yr Tsy Bond (%)
Altman-Kuehne Defaulted Bond Index	100.00	41.13	67.27	-27.90
S&P 500		100.00	56.84	-3.59
Citi High-Yield Bond Index			100.00	-3.89
Ten-Year Treasury Bond				100.00

Sources: NYU Salomon Center, S&P and Citi.

As was the case previously, the correlation of high-yield bonds and the Defaulted Bank Loan Index (57.49%) is weaker than with defaulted bonds (69.69%, Figure 16). Note the shorter measurement period for the loan index correlations. The correlation of returns on defaulted bank loans and 10-Yr Treasuries remained negative through 2010 at -25.78% and showed only slight correlation (32.85%) with the S&P 500 Index, the latter of which was down slightly from last year's 33.38% correlation. As will be discussed shortly, returns for all asset classes in the period 2008-2010 appeared to be more highly correlated than in any other distressed credit and subsequent recovery cycle we have ever observed.

Finally, the monthly return correlation between our two defaulted debt indexes decreased slightly to 65.87% from 66.29% one year earlier. This follows from the fact that the even though both indexes experienced gains in 2010, the annual bond index return was almost three times that of the loan index's.

Figure 16. Correlation of Altman-Kuehne Indexes of Defaulted Loans With Other Securities Indexes, 1996–2010 (In Percent)

	Altman-Kuehne Bond Index (%)	Altman-Kuehne Loan Index	Altman-Kuehne Combined Index	S&P 500 (%)	Citi High-Yield Bond Index (%)	10-Yr Tsy Bond (%)
Altman-Kuehne Defaulted Bond Index	100.00	65.87	92.40	43.33	69.69	-34.89
Altman-Kuehne Defaulted Loan Index		100.00	88.40	32.85	57.49	-25.78
Altman-Kuehne Combined Index			100.00	42.20	69.42	-34.42
S&P 500				100.00	60.62	-19.28
Citi High-Yield Bond Index					100.00	-15.74
Ten-Year Treasury Bond						100.00

Sources: NYU Salomon Center, S&P, and Citi.

A Continuing Investment Dilemma

Normally, in a credit environment of extremely low default risk, both in terms of recent and near-term future estimates, yield spreads should be below average and the outlook for risky debt markets fairly bullish. The yield spread at the end of 2010 is exactly that, having dropped from 564bp, and above average, at the end of the third quarter to 458bp at year-end 2010 (vs. 521bp average). However, we feel that there is still uncertainty about the future due to concerns about European sovereign and banking default risk, inflation and interest rate increases, and the refinancing needs of the private and government sectors in the U.S. These uncertainties would seem to justify at least a normal required return, risk premium situation. Indeed, if anything, yield spreads appear to us slightly below average for the uncertainties going forward.

The stock market looks undervalued, with P/E ratios relatively low, excellent growth in many corporate profits (and the economy as well), albeit mainly from cost-cutting, and interest rates still at extremely low levels. With all of the above in mind, one could be fairly bullish about the stock market's prospects, yet bearish, or at least not very optimistic about bond markets, especially high-yield. Considering investment

choices between various capital markets, it is instructive to observe historical correlations with particular scrutiny of the most recent past.

Figure 17 shows the correlation between the S&P 500 stock index monthly returns vs. both high-yield and defaulted debt indexes. The latter are based on our Altman-Kuehne Defaulted Bond and the Combined Defaulted Bond and Bank Loan Indexes. The periods covered are the last three stressed credit cycles: 1990/1991, 2001/2002, and the most recent 2008-2009 period. We also observe the correlations for the recovery period since April 2009, and other past recoveries (not shown here), as well as the entire sample period 1987-2010. The results are quite startling.

Typically during stressed credit cycles (and also the subsequent recovery), correlations between the stock market and risky debt markets are quite low - - 12% in 1990/1991, 23% in 2001/2002, and, not shown, -16% and 43% in their subsequent recoveries. Over the entire sample period since we have been tracking defaulted debt as an asset class (1987–present), the correlation between the S&P 500 and defaulted debt is only 40%, and a moderate 57% for the high-yield bond and stock markets. However, in the most recent economic and financial collapse of 2008–early 2009, correlations between defaulted bonds and the S&P 500 spiked enormously to 73% and they have continued in the subsequent recovery to 66%. In the most recent cycle (April-December 2010), the correlation between defaulted bonds and bank loans and the S&P 500 Stock Index was 77%. On any given day of late, it is almost certain that if there is bad news about financial or default related uncertainties, both risky bond and stock markets decline, with a flight to quality, and the opposite is true if the news is positive.

Our dilemma, much as it has been for all of 2010, is that if we are to be bearish about risky debt in the near future, how can we be bullish about the stock market? If the main uncertainties diminish, for example in Europe, and/or the real economies in the U.S., Europe and even China improve, can we be very confident about common stocks. The latter uncertainty seems to have diminished considerably of late. A more positive spin on the correlation pattern is that the optimistic stock market outlook will dominate bond market uncertainties and both will prosper in the near-term future.

Figure 17. Total Monthly Return Correlations on Various Asset Class Indexes During Stressed and Recovery Credit Cycles

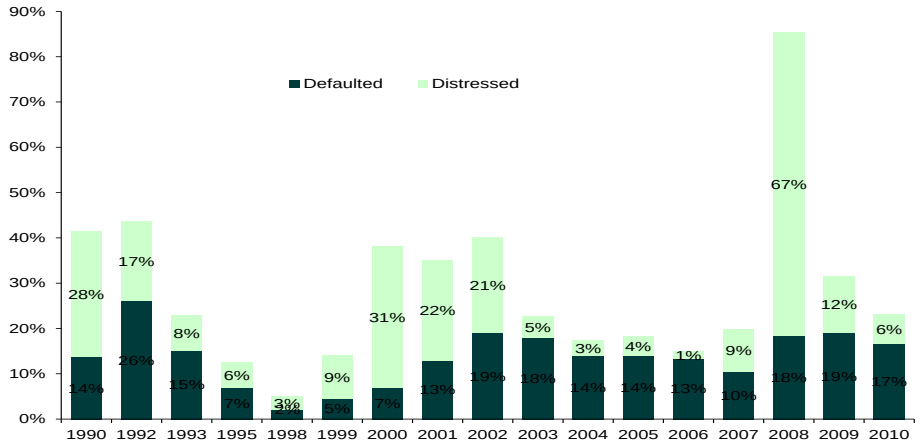
		Citi HY Index	S&P 500 Stock Index
Stressed Cycle I[a] 01/1990 – 12/1991 (24 obs.)	Defaulted Bond Index	68%	12%
	S&P 500 Stock Index	48%	
Stressed Cycle II[b] 01/2001 – 12/2002 (24 obs.)	Defaulted Bond Index	76%	23%
	S&P 500 Stock Index	54%	
Stressed Cycle III 01/2008 – 03/2009 (15 obs.)	Defaulted Bond Index	80%	73%
	S&P 500 Stock Index	73%	
Recovery Cycle 04/2009 – 12/2010 (21 obs.)	Defaulted Bond Index	70%	66%
	S&P 500 Stock Index	67%	
Full Sample Period 01/1987 – 12/2010 (288 obs.)	Defaulted Bond Index	65%	40%
	S&P 500 Stock Index	57%	
Most Recent Cycle 04/2010 – 12/2010 (9 obs.)	Defaulted Bond Index	85%	77%
	S&P 500 Stock Index	81%	

[a] Correlation between Defaulted Bond Index and S&P 500 during recovery cycle was -16%.
[b] Correlation between Defaulted Bond and Bank Loan Index and S&P 500 during recovery cycle was 43%, and the Defaulted Bond Index and the S&P was 49%.
Source: E. Altman, NYU Salomon Center.

Proportion and Size of the Distressed and Defaulted Public and Private Debt Markets

The distressed and defaulted debt proportion of the high-yield plus defaulted debt markets in the United States comprised roughly 23.0%, as of December 31, 2010 down considerably from 31.5% one year earlier (Figure 18). The primary reason for the steady decrease since December 31, 2008 was the drop in the distress ratio of issues trading at least 1,000bp over the 10-yr US Treasury bond. This ratio fell from 12.4% of the high-yield bond market, as of year-end 2009, to 7.6% by the end of 2010 and from 12% to 6% of the high-yield + defaulted debt markets. As a result, the distressed segment comprised only 6% of the total high-yield plus defaulted debt market ($1.533 trillion) as of year-end, while the defaulted segment decreased to 17%, slightly below the prior two years.

Figure 18. Distressed[a] and Defaulted Debt, as a Percentage of Total High Yield Plus the Defaulted Debt Market,[b] 1990–2010[c]



[a] Defined as yield-to-maturity spread greater than or equal to 1,000bp over comparable Treasuries. [b] $1.533 trillion as of December 31, 2010. [c] Some years not available as no survey results are available.
Source: NYU Salomon Center, Merrill Lynch (Bank of America).

The defaulted bond amount total is derived by adding the new defaults of 2010 ($13.81 billion) to the existing defaulted bonds as of year-end 2009, subtracting those bonds of firms whose reorganization plans were deemed effective and have emerged from Chapter 11 ($33.4 billion) and, finally, by deducting the value of bonds which defaulted as part of a distressed exchange during the year ($5.0 billion). The latter, while part of our defaulted total, do not trade after the exchange, or trade as non-defaulted debt.

Figure 19 shows our estimate of the size of the defaulted and distressed debt markets for both public and privately issued debt. The estimated face value of distressed public bonds is $97.3 billion, down from $181.0 billion one year earlier. As previously discussed, this is attributable to the decrease in the "distress ratio."

We are now using a private-to-public debt ratio of 2.0 times[6] (decreased from 2.5 times in prior reports) to estimate the amount of defaulted and distressed private debt (mainly bank loans, mortgages, and trade debt). Applying the 2.0 ratio to our public debt totals, we estimate that the face value of private defaulted and distressed debt is $705.2 billion. The total face value of public and private, defaulted and distressed debt as of December 31, 2010, is an estimated $1.06 trillion (Figure 19). This is a staggering decrease of about $555 billion from one year earlier, primarily due to the decrease in the distress ratio as well as the re-evaluation of the private-to-public ratio.

As indicated in Figure 19, consistent with our observations of both newly defaulted and existing defaulted loan issues in our NYU Salomon Center Index of Defaulted Bond and Bank Loan performance, we have chosen to slightly decrease our market-to-face value ratios from year-end 2009. When applied, the market value estimate of defaulted and distressed debt is about $597 billion — down significantly from both the third quarter and one year earlier (Figure 20)

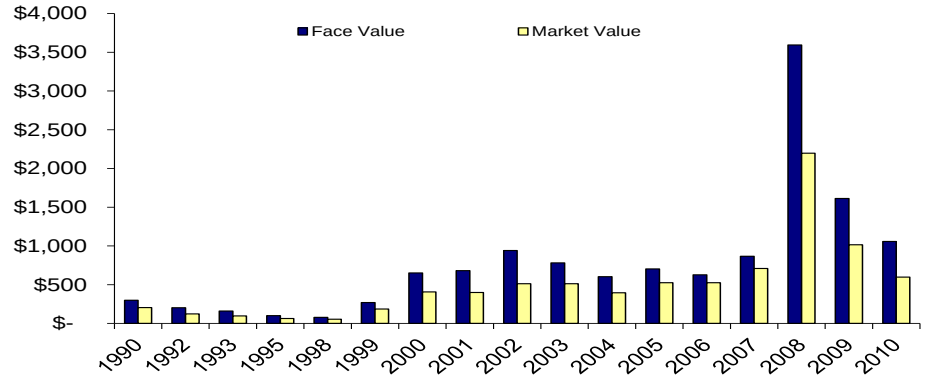
Figure 19. Estimated Face and Market Values of Defaulted and Distressed Debt, 2008–2010 (Dollars in Billions)

	Face Value ($)			Market Value ($)			
	31 Dec 08	31 Dec 09	31 Dec 10	31 Dec 08	31 Dec 09	31 Dec 10	Market/ Face Ratio[d]
Public Debt							
Defaulted	234.36	279.87	255.27[a]	40.69	97.95	102.11	0.40
Distressed	888.53	180.95	97.32[b]	488.69	135.71	68.12	0.70
Total Public	1,122.89	460.82	352.59	529.38	233.67	170.23	
Private Debt							
Defaulted	515.59	699.67	510.54[c]	299.11	419.80	280.79	0.55
Distressed	1,954.76	452.38	194.64[c]	1,368.33	361.90	145.98	0.75
Total Private	2,470.35	1,152.05	705.17	1,667.44	781.70	426.77	
Total Public and Private	3,593.24	1,612.86	1,057.76	2,196.82	1,015.37	597.00	

[a] Calculated using: (2009 defaulted population) + (2010 defaults) - (2010 Emergences) – (2010 Distressed Restructurings). [b] Based on 7.62% of the size of the high-yield market ($1.278 trillion). [c] Based on a private/public ratio of 2.0. [d] The market/face value ratio was 0.35 for public defaulted debt, 0.75 for public distressed debt, 0.60 for private defaulted debt and 0.80 for private distressed debt in 2009.
Source: NYU Salomon Center and estimates by Professor Edward I. Altman.

[6] Based on an updated sample of over 150 bankrupt firms from 2007-2009.

Figure 20. Size of the Defaulted and Distressed Debt Market, 1990–2010 (Dollars in Billions)



Source: Professor Edward I. Altman estimates, NYU Salomon Center.

Demand for Distressed Debt Securities

At the end of 2007, we estimated that the amount of assets under management (AUM) in distressed debt hedge funds and related investment vehicles was $350 billion. In 2008, however, due to average investment losses of about 20–25% and net redemptions of limited partner funds of a similar percentage, we estimated that the investment in distressed assets by these funds dropped by at least 40% to $210 billion, or less.

In 2009, distressed debt's attraction came roaring back as the credit market's meltdown dissipated and government actions calmed financial markets. Despite a considerable increase in defaults, returns soared and investors came back to some funds. We estimate that AUM increased in 2009 by over 30% to $275-$300 billion, mainly due to exceptional performance and less so due to net inflows. For 2010, with the increase in returns ranging from 10-17% depending upon the Index, and with the continued popularity in distressed and credit funds, the AUM at the end of 2010 could have equaled about $350 billion, back to the 2007 total.

Appendix A lists the Distressed Debt Managers in the US and Europe as well as those managers who practice an active/control strategy. Of course, these managers invest in many asset classes in addition to distressed securities. We try to update our lists periodically, but would appreciate your editing the list and informing us of any changes.

Forecasting Default Rates and Recoveries

Note: The following material is excerpted from our earlier report on "Defaults and Returns in the High-Yield Bond and Distressed Debt Market" (February 4, 2011). Readers who have already seen that report may skip this section.

Forecasting aggregate default and recovery rates is a tricky exercise that can be based on a "bottom-up" approach on individual issues and issuers or a macro, "top-down" approach – or both. For practical and track-record reasons, we have chosen the top-down approach using both aggregate amounts of new issuance over the last decade stratified by the major ratings categories (mortality statistics) and also point-in-time proportions of issues by the major non-investment grade, high-yield bond categories. The latter technique is specific to only recessionary results (scenario analysis). Finally, we also analyze the information content of market-based measures, such as yield spreads and distressed ratios, to forecast the near-term default performance of the market. These four techniques, or three in the case of non-recessionary expectations, are then averaged to arrive at our single default rate estimate, although the range of probable outcomes can be observed as well. Our default rate estimates are then used as inputs to form the basis for estimates of aggregate recovery rates on corporate high-yield bond defaults.

2010 Mortality Rate-Based Forecast

Using our standard mortality rate forecasting method for 2008, our forecast of 4.64% for the high-yield bond default rate was remarkably close to the actual 2008 rate, which came in at 4.65% (Figure 21). We then had expected our 2009 default rate forecast would be on the low side, using the same mortality rate methodology. After all, the mortality rate incidences of the past have been based on six recession periods covering only about six-and-a-half years of the 39 in our sample period (1971–2009). Therefore, a nonrecessionary, macroeconomic climate dominates our statistics. With a severe recession in place coming into 2009, we expected the mortality rate methodology to underestimate the actual default results. Indeed, the actual default rate was 10.77% in 2009 compared to our forecast of 7.98%, a respectable under-estimate. Since the mortality method is an actuarial smoothing technique, we know that it will not be sensitive to extreme yearly, abnormal conditions. For this reason, we also in addition sometimes consider recession scenario analyses and market-based statistics to provide useful estimates of future results.

Utilizing the updated mortality rate statistics in Figure 25 of our first Annual Report (published on February 4, 2011), and inputting new issuance statistics per rating class over the past ten years, we estimate that the 2011 default rate will be 3.90%, with a recovery rate of about 37.6% (Figure 21). Our forecast also utilizes an estimate of the expected size of the high-yield bond market for 2011.

Figure 21. Mortality Rate-Based Forecasts of Default and Recovery Rates in the High-Yield Bond Market, 2008–2011

Year	Default Rate	Default Amount ($ Billions)	Recovery Rate
2008 (Forecast)	4.64%	$53.1	39.6%[a]
2008 (Actual)	4.65%	$50.2	42.5%
2009 (Forecast)	7.98%	$92.0	30.0%[a]
2009 (Actual)	10.77%	$124.1	36.1%
2010 (Forecast)	**5.06%**	**$62.5**	**34.9%**
2010 (Actual)	1.13%	$13.8	46.6%
2011 (Forecast)	**3.90%**	**$54.8**	**37.6%**

[a] Based on the log-linear and linear default/recovery rate regressions.
Source: NYU Salomon Center

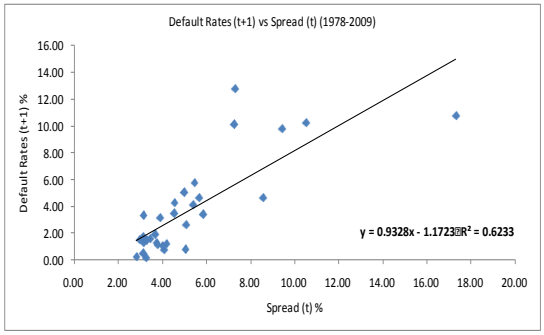
Market-Based Methods for Forecasting Defaults

In 2008, we introduced two alternative methods for forecasting default rates. The first relies on the market's spread on high-yield bonds compared to 10-yr US Treasuries. The second utilizes the proportion of high-yield bonds selling at 1,000bp over 10-yr US Treasuries (distress ratio)[7]. In both cases, we regress the market-based measure in period (t) and the subsequent one-year default rate in period (t+1).

Based on the yield-spread regression on December 31, 2007, this method predicted a 4.62% 2008 default rate, essentially a perfect forecast, and as of the end of 2008, it predicted an astounding 20.81% default rate. As of the end of 2009, we estimated through this method that the cumulative default rate for the next 12 months, ending December 2010, would be 3.89%. However, we have since updated the regression model to include 2009's data, and have recalculated the estimated default rate for the 12 months ending December 2010 to be 3.61%. Inputting the year-end spread of 4.58% into our updated regression model as of December 31, 2010 results in a one-year default rate forecast for December 2011 of 3.10%, lower than the mortality rate forecast (Figure 22).

[7] The distress-ratio first introduced in our 1990 study of "Investing in Distressed Securities," was recently the subject of review in a study by J. Gonzalez-Heres, P. Chen and S. Shin, "Revisiting the Altman Definition of Distressed Debt and a New Mechanism for Measuring the Liquidity Premium of the High-Yield Market", *Journal of Fixed Income*, Fall 2010.

Figure 22. Market-Based Forecast: Default Rate (t+1) Versus Spreads (t)



The regression equation is
Default Rate = - 1.17 + 0.93 * Spread

Predictor	Coef	SE Coef	T	P
Constant	-1.1723	0.8075	-1.4518	0.1573
Spread	0.9328	0.1347	6.9266	0.0000

S = 2.1914 R-Sq = 62.3% R-Sq(adj) = 61.0%

Application

Yield spread (12/31/2007) of 566bps, forecast P_D for 2008 = **4.11%** vs. actual of 4.65%

Yield spread (12/31/2008) of 1,731bps, forecast P_D for 2009 = **14.97%** vs. actual of 10.77%

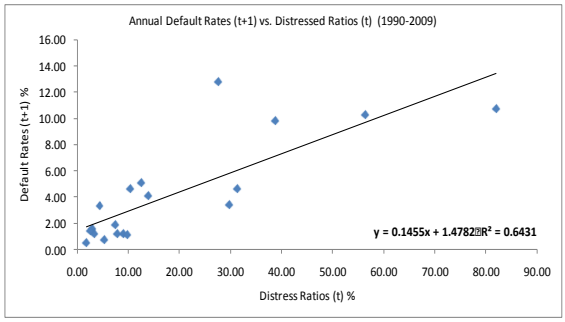
Yield spread (12/31/2009) of 513bps, forecast P_D for 2010 = **3.61%** vs. actual of 1.13%

Yield spread (12/31/2010) of 458bps, forecast P_D for 2011 = **3.10%**

Sources: Figures 1 and 27, NYU Salomon Center and authors' compilation.

A second market-based method utilizes the distress ratio, that is, the proportion of the high-yield bond market trading at least 1,000bp over Treasuries. Inserting the distress ratio of 7.62% as of December 31, 2010 into our updated regression model reveals an expected 2.59% default rate for year-end 2011 (Figure 23).

Figure 23. Market-Based Forecast: Default Rate (t+1) Versus Distressed Ratio (t)



The regression equation is
Default Rate = 1.48 + 0.15 * Distress Ratio

Predictor	Coef	SE Coef	T	P
Constant	1.4782	0.7352	2.0105	0.0605
Spread	0.1455	0.0263	5.5347	0.0000

S = 2.3745 R-Sq = 64.3% R-Sq(adj) = 62.2%

Application

Distress ratio (12/31/2007) of 10.42%, forecast P_D for 2008 = **3.00%** vs. actual of 4.65%

Distress ratio (12/31/2008) of 82.05%, forecast P_D for 2009 = **13.42%** vs. actual of 10.77%

Distress ratio (12/31/2009) of 15.28%, forecast P_D for 2010 = **3.70%** vs. actual of 1.13%

Distress ratio (12/31/2010) of 7.62%, forecast P_D for 2011 = **2.59%**

Sources: Merrill Lynch & Co., NYU Salomon Center and authors' compilation.

Default and Recovery Conclusions

Considering the various forecasting methods, we observe that the forecast range is between 2.59% (distress ratio) and 3.90% (mortality rate). There is no obvious way to reach a consensus from the different techniques, so we simply took the average of

the three to obtain our forecast of 3.20% (Figure 24). Inputting this estimate into our recovery regression (Figure 19 of our earlier Report[8]), we estimate that 2011's high-yield bond default recovery rate will be 39.8%, based on our log-linear model.

Note that the 2011 forecast assumes that the U.S. economy will *not* experience a "double- dip" recession in 2011, and therefore we have eliminated the recession scenario-based forecasting method from the default and recovery rate forecasts.

Figure 24. 2011 Default and Recovery Forecasts: Summary of Forecast Models

Model	2010 Recession Scenario Default Rate Forecast as of 12/31/2009	2010 No Recession Default Rate Forecast as of 12/31/2009	2011 Default Rate Forecast as of 12/31/2010
Mortality Rate	5.06%	5.06%	3.90%
Recession Scenarios	14.00%	n/r	n/r
Yield-Spread Regression	3.61% [a]	3.61% [a]	3.10% [c]
Distressed Ratio Regression	3.70% [b]	3.70% [b]	2.59% [d]
Average of Models	**6.59%**	**4.12%**	**3.20%**
Recovery Rates[a]	**32.0%**	**37.1%**	**39.8%**

[a] Based on the log-linear regression (Figure 19 of Altman-Kuehne (2011)). [b] Based on 12/31/2010 yield-spread of 458.0bp. [c] Based on 12/31/2010 Distressed Ratio of 7.62%.
Sources: All Corporate Bond Issuance, Figures 25, 37-38 (of Altman-Kuehne (2011), and Authors' Estimates of Market Size in 2011.

[8] E. Altman and B. Kuehne "NYU Salomon Center Report on Defaults and Returns in the High-Yield and Distressed Debt Market: The Year 2010 in Review and Outlook", *NYU Salomon Center*, February 4, 2011.

Appendix A

US Distressed Debt Managers

Abrams Capital	Bond Street Capital	DKPR Wolf Point Mgmt.	Greywolf Capital
ADM Maculus	Boone Capital Mgmt.	Drake Mgmt.	Gruss Asset Mgmt.
AEG	Brencourt Advisors	Dreman Value Mgmt.	GSC Group
Aladdin Credit Partners	Brigade Capital	Drucker Capital	GSO Capital Prtnrs.
Anchorage Advisors	The Broe Companies	Dune Capital Mgmt.	Guggenheim Inv. Mgmt.
Angelo, Gordon & Co.	Brookfield Asset Mgmt.	Durham Asset Mgmt.	H.I.G.
Apex Fndmntl Partners	Canyon Capital	Eagle Rock Capital	Hain Capital
Apollo Managememt	Candlewood Partners	Elliott Advisors	Halbis Cap. Mgmt. (US)
Appaloosa Mgmt.	Cardinal Capital	Endurance Capital	Halcyon/Slika Mgmt.
Archview Investment	Carl Marks	EOS Partners	Harbert Fund Advisors
Ares Corp. Opp. Fund	Carlyle Strategic	Epic Asset Mgmt.	Harbinger Capital
Ashmore Asian Recov.	Cargill Value Invstmt.	Everest Capital Ltd	Harvest Capital
Atalaya Cap. Mgmt.	CarVal Investors	Fairfield Greenwich	Helios Advisors
Aurelius Capital Mgmt.	Caspian Capital	Farallon Partners	HIG Brightpoint Cap.
Avenue Capital Group	Centerbridge Capital	Fintech Advisory	Highbridge Cap. Mgmt.
Basso Asset Mgmt	Cerberus Partners	Fir Tree Partners	Highland Capital
Baupost Group	Citadel Investments	Forest Investment Mgmt.	Highland Rest. Cap.
Bay Harbour Mgmt.	Cohanzick Mgmt.	Franklin Mutual Recovery	Huizenga Cap. Mgmt.
Bayside Capital	Columbus Hill Cap.	Fulcrum Capital Mgmt.	Icahn Capital Corp.
Beltway Capital	Commonwealth Advisors	GE Finance	Insight Equity
Bennett Mgmt Co.	Contrarian Cap. Mgmt.	Glenview Capital Mgmt.	Ivory Invest. Mgmt.
Black Diamond	Corsair Capital	GLG Partners, NA	Jana Partners
Blackport Capital Fund	Cypress Mgmt.	Global Credit Advisors	JLL Partners
Black River Asset Mgmt.	Cyrus Capital Partners	Golden Capital	JMB Capital
Blackrock	D.E. Shaw	GoldenTree Asset Mgmt.	K Capital Partners
Blackstone Group	Davidson / Kempner	Goldman Spec Sit.	KD Distressed Capital
Blue Mountain Cap Mgmt.	DDJ Capital Mgmt.	Gracie Capital	Kilimanjaro Advisors
Blue Wolf Capital	Deephaven Cap. Mgmt.	Gradient Partners	King Street Advisors
Bluebay Asset Mgmt.	Delaware Street Capital	Gramercy Capital	Knighthead Capital
Bluecrest Cap. Mgmt.	Deltec Recovery Fund	Greenlight Capital	KPS Spec. Situations Fund

US Distressed Debt Managers (Continued)

Lampe Conway	Onex Credit Partners	Seneca Cap. Inv. Ptnshp	Tudor Investment Corp.
Latigo Partners	Orehill Partners	Signature Cap. Ptnrs.	Turnberry Capital
Laurel Ridge Ast Mgmt.	Owl Creek Asset Mgmt.	Silverpoint Capital	Twin Haven Capital
Leucadia Nat'l Corp.	P. Schoenfeld Asset Mgmt.	Solus Alternative Mgmt.	Tyndall Partners
Levco Debt Opps.	Pacholder Assoc., Inc.	Soros NY	Van Kampe
Litespeed Partners	Pacific Altern. Ast Mgmt.	Spring Street	Varde Partners, Inc.
Littlejohn & Co.	Paige Capital	Stanfield Capital Mgmt.	Venor Capital Mgmt.
Loeb Partners	Pardus Capital	Stairway Cap Advisors	Versa Capital Mgmt
Lonestar Partners	Patriarch	Standard Gen'l Mgmt.	Viking Global
LongAcre Cap. Partners	Paulson & Co.	Stark Investments	W.L. Ross & Co.
Longroad Asset Mgmt	Pegasus Investors	Stone Harbor Inv. Ptnrs.	Washington Corner Cap.
Marathon Capital	Perella Weinberg Ptnrs.	Stonehill Capital	Watershed Asset Mgmt.
Mariner Invest. Group	Perry Partners	Stone Lion Capital	Wayzata Invest. Partners
Mason Capital Management	Phoenix Investment Adv.	Stony Lane Partners	Wellspring Cap. Partners
MatlinPatterson Global	Pine Creek	Strategic Value Ptnrs.	Wexford Capital
Mellon HBV Cap. Mgmt.	Pinewood Cap. Partners	Summit	William E. Simon & Sons
MHR	Plainfield Asset Mgmt.	Sunrise Capital Partners	Woodside Management
Millennium	PMI	TA Mckay & Co.	York Capital
MJ Whitman Mgmt. Co.	Principal Global Investors	Taconic Capital Ptnrs	Z Capital Partners
Monarch Alternative Cap.	Questor Management	Tennenbaum Capital	William E. Simon & Sons
Monomoy Capital	Radius Partners	Third Avenue Value Fd.	Woodside Management
Mount Kellett Cap. Mgmt.	Ramius	Third Point	York Capital
MSD Capital	Redwood Capital	Tiburon Capital Mgmt.	Z Capital Partners
New Generation Advisers	Resolution Partners	Treadstone Group	
Normandy Hill Capital	Restoration Cap. Mgmt.	Tricadia Capital	
Oakhill	Resurgence Corp. Fd.	Triage Capital	
Oaktree Capital	Salisbury	Trilogy Capital	
Och Ziff Capital Mgmt.	Sandell Asset Mgmt	Trust Co. of the West	
Octavian Advisors	Scoggin Capital	Tuckerbrook	

US Distressed Funds with European Offices

Aladdin Capital Management	Highbridge Capital Management
Apollo Management	Kelso Place Asset Management
Avenue Capital Group	Lonestar Partners
Camulos Capital	Marathon Capital
Cargill Investors	Matlin Patterson Global Advisors
Cerberus Partners	Millennium Capital
Citadel Investments	Oaktree Capital
Davidson Kempner	Och Ziff Capital Mgmt.
D.E. Shaw	Peter Schoenfeld Asset Mgmt.
Elliott Advisors	Silverpoint Capital
EOS Partners	Strategic Value Partners
Fortress Capital Corp.	TPG Credit Mgmt.
HBK Investments	Värde Partners

European Distressed Debt Managers (Home Grown)

Alchemy Partners	HIG Europe Capital Partners
Argo Capital	Ilex
Arrowgrass Capital Partners	Marco Polo
Bluebay Asset Management	Nordwind Capital
Butler Capital Management	Orlando Management GmbH
Carousel	Perusa
Cyrus Capital	Providente
Development & Partenariat	RAB Capital
Endless	Rutland Fund
EQT Opportunities	Sisu Capital
Equinox	Sothic Capital Management
Fin'active	Trafalgar Asset Managers
Fortelus Capital management	Verdoso Special Opportunity Fund
Green Recovery	Vermeer Capital Partners
H2 Equity Partners	

Distressed Active/Control Investors

American Securities	Highland Rest. Capital Partners	Relativity Fund
Angelo, Gordon & Co.	Insight Equity I	Remedial Capital
Apollo Management	Levine Liechtman	Resurgence Asset Management
Appaloosa Management	Littlejohn & Co.	Sandell Asset Management Corp.
Audax Credit Opportunities	Lone Star Partners	Saybrook Capital
Aurelius Capital Management	Longroad Asset Management	Silver Point Capital
Aurora Resurgence Mgmt. Partners	KPS Special Situations Fund	Stark Investments
Avenue Capital Partners	Marlin Equity Partners	Strategic Value Partners
Bay Harbour Management	MatlinPatterson Global Advisors	Sun Capital Partners
Black Diamond	Mellon HBV	Sunrise Capital
BlackEagle Partners	MHR Institutional Partners	Tuckerbrook
Brookfield Asset Mgmt.	Monomoy Capital Partners	Tudor Investment Corp et al
Carlyle Strategic Partners	Newport Global Advisors	Twin Haven Capital
Catalyst Partners	Oakhill	Versa Capital Management
Centerbridge Capital Partners	Oaktree Capital	Water Tower Capital
Citadel Limited Partnership	P. Schoenfeld Asset Management	Wayzata Investment Partners
DDJ Capital Management	Paulson & Co.	W.L. Ross & Co
Elliott Associates	Perry Capital	Whippoorwill Associates
Farallon Capital	Plainfield Asset Mgt	Wingate Partners
Gores Group	Platinum Equity Capital Partners	York Capital
Harbinger Capital Partners	Prophet Equity	Z Capital Partners
H.I.G. Capital	Ramius Capital Group	