

# Distressed and Defaulted Debt Securities: Market Dynamics and Investment Performance

## 1. Introduction

The market for investing in distressed and defaulted debt is continuing to receive a great deal of attention despite the shrinkage in the supply of new securities in the last few years. This is primarily due to the continued excellent return performance of defaulted bonds, the expected growth in the supply of new distressed and defaulted public and private debt paper, and the clearly documented relatively low correlation of returns with the more traditional debt and equity markets. This study reviews some of the important attributes of this unique investment vehicle and updates our analysis of the risk and return performance of defaulted debt.

Distressed securities can be defined narrowly as those publicly held and traded debt and equity securities of firms that have defaulted on their debt obligations and/or have filed for protection under Chapter 11 of the U.S. Bankruptcy Code. A more comprehensive definition would include those pu-

blicly held debt securities selling at sufficiently discounted prices so as to be yielding, should they not default, a significant premium over comparable duration U.S. Treasury bonds. For this segment, I have chosen a premium of a minimum of 10 percent over comparable Treasuries. With interest rates falling as much as they have by mid-1995, this definition would currently include bonds yielding at least 16.30%.

Finally, distressed securities can include those bank loans and other privately placed debt of the same or similar entities with rather acute operating and/or financial problems. With the continued growth in the volume of distressed bank loans that now trade rather frequently, investors are increasingly aware of the potential price movements of these heretofore illiquid "securities." Recent estimates, from professionals, of the annual volume of distressed bank loan trading in the U.S. is in the \$10-15 billion range. Indeed, trading is apparently sufficient to have spawned several brokers who specialize in distressed bank debt.

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## 2. Supply of Distressed Securities

In my prior work on the distressed and defaulted debt market, estimates of the size of the market were as high as \$300 billion (face value) and \$200 billion (market value) at the start of 1990. Since that date,

the size of the market has diminished consistently. This data is shown in Exhibit 1 and includes public and private debt estimates. The private debt total was estimated by applying a multiplier of as high as three times the public debt in 1990 and as low as 1.85-to-one in 1992. Both of these estimates are based on empirical observations of a large number of bankrupt firms' balance sheets (ALTMAN 1990 and 1993). Since we have not had the opportunity to do an in-depth analysis of this ratio of private to public debt since 1992, we will use an estimate of 2:4 to 1 - approximately the mid-point between the two prior estimates.

As of June 30, 1995, I estimate that the public defaulted and distressed markets had face values of \$16.5 billion and \$13.3 billion respectively (Exhibit 1). Using the aforementioned multiplier of 2.4 for private debt, the private totals are \$39.6 billion (defaulted) and \$31.9 billion (distressed). We are quite confident that, on average, defaulted public debt, which is a mixture of senior and subordinated

securities, sells for about 50% of face value and public distressed debt for about 60% of face value. Private defaulted debt, which is predominantly senior in priority, is estimated to sell at 60% of face value and private distressed debt at 75% of face value. Hence, the most current (June 1995) estimate of total public and private, defaulted and distressed debt, is about \$100 billion (face) and \$64 billion (market). These figures do not include non-U.S. debt, eg., Canadian, U.K. and some European corporates.

### 3. Future Supply

A critical question for the distressed security investor, sometimes called a "vulture", is the likely supply of new defaulted and distressed paper, i.e., the expected raw material for possible future investments. While I do not use a formal econometric model for predicting near term default rates[1], a

**Exhibit 1: Estimated Face and Market Values of Defaulted and Distressed Debt (1990-1995) (\$Billions)**

	January 31, 1990		August 31, 1992		August 31, 1993		June 30, 1995	
	Face Value	Market Value	Face Value	Market Value	Face Value	Market Value	Face Value	Market Value
Public Debt:								
Defaulted	\$25.0	\$11.4	\$42.6	\$20.5	\$31.5	\$15.8	\$16.5	\$ 8.3
Distressed	50.0	33.0	28.4	16.5	15.6	9.4	13.3	8.0
<b>Total Public</b>	<b>76.0</b>	<b>44.4</b>	<b>71.0</b>	<b>37.0</b>	<b>47.1</b>	<b>25.1</b>	<b>29.8</b>	<b>16.3</b>
Private Debt:								
Defaulted	78.0 <sup>1</sup>	46.8	78.8 <sup>2</sup>	47.3	75.6 <sup>3</sup>	43.4	39.6 <sup>3</sup>	23.8
Distressed	150.0 <sup>1</sup>	112.5	52.5 <sup>2</sup>	39.4	37.4 <sup>3</sup>	28.1	31.9 <sup>3</sup>	23.9
<b>Total Private</b>	<b>228.0</b>	<b>159.3</b>	<b>131.4</b>	<b>86.7</b>	<b>113.0</b>	<b>71.5</b>	<b>71.5</b>	<b>47.7</b>
<b>Total Public &amp; Private</b>	<b>\$304.0</b>	<b>\$203.7</b>	<b>\$202.4</b>	<b>\$123.7</b>	<b>\$160.1</b>	<b>\$ 96.6</b>	<b>\$101.3</b>	<b>\$ 64.0</b>

<sup>1</sup> Assumes 3-to-1 ratio of private to public debt

<sup>2</sup> Assumes 1.85-to-1 ratio of private to public debt

<sup>3</sup> Assumes 2.4-to-1 ratio of private to public debt

Sources: E. ALTMAN (1994) and recent estimates from Salomon Brothers, Inc. and Merrill Lynch & Company

reasonable method would be to extrapolate default totals based on the amount of new issuance in the recent past and the relationship between new issuance, segregated by original bond credit ratings, and expected defaults of these new issues. A method for doing just this is the mortality rate approach, first developed in the late 1980's (ALTMAN, 1989) and updated each year. Estimates, based on new issuance from 1971-1993 and defaults through 1994, are given in Exhibit 2.[2]

Based on new issuance by bond rating from 1986-1993 and the mortality rate data in Exhibit 2, I estimate that new default totals will be approximately \$27.4 billion over the next four years (Exhibit 3). Due to the high proportion of senior bonds issued in the high yield debt market since 1990 - about 70 percent of the total new issuance - the expected average price at default is about 45% of par value. This implies a market value estimate of about \$12.3 billion of new defaults over the period 1995-1998. These public defaults will probably be accompanied by new private defaulted debt face value totals of about \$66 billion. This is based on a 2.4 to 1.0 ratio of private to public. The resulting expected total of public and private defaulted debt at face

value is therefore approximately \$93 billion, over \$51 billion market value (Exhibit 3). Incidentally, although these numbers look quite large, the resulting implied default rate in the U.S. high yield debt market is approximately 2.5% per year - well below the historical annual weighted average of 4.2% (ALTMAN & KISHORE, 1995).

#### 4. Distressed Securities Investor Profile

Despite the fact that some distressed investors have abandoned the market in the last two years as the supply of new defaulted debt has diminished, there still exists an impressive number of investors, who specialize in this rather unique asset class. The primary vehicle for investing is a limited partnership, whereby a particular distressed-asset investment manager raises funds from financial institutions and wealthy individuals. Also, increasingly we observe institutions putting together a distressed or restructuring fund in order to place money with a small number of different distressed securities managers.

The overwhelming majority of these investors

**Exhibit 2: Mortality Rates by Original Rating - All Rated Corporate Bonds\* (1971-1994) Years After Issuance**

Rating		1	2	3	4	5	6	7	8	9	10
AAA	Yearly	0.00%	0.00%	0.00%	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%
	Cumulative	0.00%	0.00%	0.00%	0.00%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%
AA	Yearly	0.00%	0.05%	1.06%	0.09%	0.00%	0.00%	0.01%	0.00%	0.06%	0.04%
	Cumulative	0.00%	0.05%	1.11%	1.20%	1.20%	1.20%	1.20%	1.20%	1.26%	1.30%
A	Yearly	0.00%	0.19%	0.07%	0.21%	0.06%	0.06%	0.20%	0.19%	0.00%	0.00%
	Cumulative	0.00%	0.19%	0.26%	0.47%	0.53%	0.59%	0.78%	0.98%	0.98%	0.98%
BBB	Yearly	0.41%	0.25%	0.32%	0.55%	0.89%	0.39%	0.09%	0.00%	0.59%	0.23%
	Cumulative	0.41%	0.66%	0.97%	1.51%	2.39%	2.77%	2.86%	2.86%	3.44%	3.66%
BB	Yearly	0.50%	0.58%	4.15%	4.84%	1.13%	0.52%	2.69%	0.27%	0.79%	0.78%
	Cumulative	0.50%	1.09%	5.19%	9.78%	10.79%	11.26%	13.64%	13.87%	14.55%	15.21%
B	Yearly	1.59%	7.12%	6.80%	7.29%	3.40%	5.90%	2.80%	2.13%	2.83%	3.43%
	Cumulative	1.59%	8.60%	14.82%	21.02%	23.71%	28.21%	30.22%	31.70%	33.63%	35.91%
CCC	Yearly	8.32%	10.69%	18.53%	10.26%	9.18%	5.56%	2.49%	2.97%	12.28%	N.A.
	Cumulative	8.32%	18.13%	33.30%	40.14%	45.63%	48.66%	49.94%	51.42%	57.39%	N.A.

\*Rated by S & P at issuance; Based on 493 issues that defaulted within 10 years of Issuance.

**Exhibit 3: Expected Supply of New Defaulted Debt (U.S. Only, 1995-1998)**

Debt Type	Defaulted Debt Par Value (\$Billion)	Defaulted Debt Market Value (\$Billion)
Public Straight Debt	\$27.42	\$12.34
Private Senior Debt*	\$65.81	\$39.49
Total	\$93.23	\$51.83

\*Assumes private/public ratio of 2.4; market value at default at 0.60 of face value.

specialize in debt securities with between 85% and 100% of their assets in distressed debt. In many cases, however, the original debt purchase will evolve into an equity interest via either a distressed exchange issue or bankruptcy reorganization. Most "vultures" have become more active in particular situations as well as continuing to operate under the traditional passive investment strategy. "Active" investing implies purchasing sufficient amounts of bonds in a particular debt class to either help formulate the restructuring plan or to be capable of blocking a proposed plan of reorganization that is unattractive to them.

Despite these variations of investment strategies, the formula for successful investing continues to require a set of fundamental valuation and technical skills complemented by a patient and disciplined approach to asset management. And, skillful negotiation talent will prove particularly rewarding in some of the more contentious restructuring battles.[3]

Since there is such a premium put on specialized talents and backgrounds and the need to attract capital by performing exceptionally well, I have found that investors require relatively high minimum annual rates of returns in the 20-25% range. The risky and illiquid nature of this market make such expected returns necessary. As we will show, however, the average performance in this market over the last eight years, although quite good, has been somewhat below the 20-25% per year range.

The remainder of this paper reports on the performance of defaulted bonds in the 1987-1994 period. While it still may be premature to refer to distressed and defaulted debt securities as an asset class or market, especially in view to its diminished size in 1995, we are confident that investment attention in defaulted securities will not only continue but will increase in both supply and demand in the near-term future as well as the long run. In the final analysis, there will always be a market for the buying and selling of securities of problem firms which afford opportunities for considerable price appreciation greater than more typical corporate debt securities, provided that the firms' problems are addressed successfully and where the current prices may be overly discounted due to the temporary distressed condition of the issuers.

## 5. Monitoring Performance

In order to monitor the performance of defaulted debt securities, a measure called the ALTMAN-NYU Salomon Center Index of Defaulted Debt Securities (A-NYU Index) was developed.[4] The Index is comprised of the publicly traded bonds of companies which have defaulted on their interest and/or principal payments. In almost all cases, the companies are operating at various stages of the Chapter 11 bankruptcy-reorganization process - from just after default up to when the bankrupt firm either emerges from Chapter 11, is liquidated, or until the default is "cured" or resolved through an exchange. The index includes issues of all seniorities, from senior-secured to junior-unsecured debt. A study by ALTMAN and EBERHART (1994) assesses the performance of defaulted debt from the time of original issuance through default and to emergence from bankruptcy. That study finds that both the seniority of the issue and convertibility (or lack thereof) into common stock are extremely important determinations of the performance of defaulted debt for specific periods, i.e., from issuance to emergence. Note that the Index does not include convertible issues.

The size of the Index has varied over time in terms of the number of securities and their book and market values. The Index starts in December 1986 = 100 with 51 different securities. The number of issues has been as high as 233 issues in 1992 and as of December 31, 1994 was comprised of 93 issues (35 companies) with a book value of \$6.3 billion and a market value of \$3.3 billion. The 1994 totals are considerably reduced from the high point in 1992. These changes in the size of the Index reflects trends in the number of defaults and bankruptcy filings vs. those firms and securities that have emerged from the Chapter 11 process. Indeed, the trend toward a reduced size of the Index continued in 1995 with just

58 issues involved by mid-year. For a variety of reasons, I expect the number of issues to rise in the next several years. The Index is calculated based on the market values of the component securities on a monthly basis. Hence, larger issues weight more heavily on the performance of the Index than do smaller ones. Since almost none of the securities are making interest payments while in default, the performance is strictly based on price changes. Price quotes are derived from a number of sources including the Standard & Poor's Bond Guides, Moody's, and several dealer quotes. We either use the end of month transaction price or the mean of the bid - ask spread when no transaction takes place.

**Exhibit 4: ALTMAN-NYU Salomon Center Index of Defaulted Debt Securities & Other Speculative Securities Indexes Comparison of Returns (1987-1994)**

Year	Altman-NYU Salomon Center Index (Market Weighted)	S&P 500 Stock Index	Merrill Lynch High Yield Master Index
1987	37.85%	5.26%	4.67%
1988	26.49%	16.61%	13.47%
1989	-22.78%	31.68%	4.23%
1990	-17.08%	-3.12%	-4.35%
1991	43.11%	30.48%	34.58%
1992	15.39%	7.62%	18.16%
1993	27.91%	10.08%	17.18%
1994	6.66%	1.32%	-1.16%
1995*	12.11%	20.21%	12.76%
1987-1994 Arithmetic Average (Annual) Rate	14.69%	12.49%	10.85%
Standard Deviation	24.31%	12.87%	12.65%
1987-1994 Compounded Average (Annual) Rate	12.22%	11.87%	10.24%
1987-1994 Arithmetic Average (Monthly) Rate	1.04%	1.04%	0.83%
Standard Deviation	3.78%	4.44%	1.68%
1987-1994 Compounded Average (Monthly) Rate	0.97%	0.94%	0.82%

\*Through June 30, 1995.

Due to the relatively long historical record of the A-NYU Index, its relatively large and comprehensive nature and the objective source and maintenance, the Index is considered one of the most, if not the most, authoritative performance benchmarks for distressed investor money managers and for market observers and other investors. Several electronic software and other market sources carry the A-NYU Index to its subscribers.

### 5.1 1994 and 1995 Performance

The ALTMAN-NYU Salomon Center Index continued its upswing in 1994 but at a more modest and reduced rate of return (+6.66%) than in the previous three years. It should be emphasized, however, that the positive return in 1994 was influenced considerably by the ten (10) issues of Western Union's two issuing entities. Indeed, without the Western Union issues, the total return for 1994 was -2.45% (a swing of over nine percent)!

Despite the modest overall performance of defaulted debt securities, the total return was superior to that of the S&P Common Stock Index (+1.32% - assuming reinvestment of dividends), the Merrill Lynch High Yield Debt Master Index (-1.17%) and the 10-year U.S. Government Bond rate (-8.29%). In general, all fixed income securities took a beating in 1994 as interest rates increased throughout the year and the longer duration 10-year U.S. Government securities performed the worst - by far. Defaulted securities are not very sensitive to interest rate changes except as it affects the future earning power of the firm, especially after it emerges (if it does) from reorganization. Defaulted debt prices can also be negatively impacted if there is a dramatic "flight to quality".

The Index climbed impressively in the first half of 1995, with a return of 12.11% (Exhibit 4). Our other two indices of risky security performance also rose significantly in 1995.

### 5.2 Eight Year Comparative Performance

In Exhibit 4 we observe the return on defaulted debt securities as well as common stocks and high yield bonds for the entire eight year sample period, 1987-1994. Note that both the arithmetic average (14.7% per year) and the geometric average (12.2% per year) for defaulted debt was greater than the S&P 500 and high yield bond indexes for the same period. In five of the eight years, defaulted debt securities performed better than both of the other two indexes while in two years it performed the worst. Hence the volatility of the annual returns was considerably greater. On a monthly basis, however, the volatility comparison, as measured by the standard deviation of returns, is considerably different with defaulted debt issues actually showing lower volatility than common stocks but still higher than high yield "junk" bonds.

### 6. Diversification Attributes: Risky Asset Returns Correlations

One of the less obvious potential strategies suggested by our analysis is to include defaulted debt in a larger portfolio of risky securities. Some pension funds have, in effect, taken this approach by allocating a small proportion of their total investments to distressed debt money managers. Almost all portfolio managers involved in the distressed market have been specialists in the sector, rather than investors in distressed bonds within broader-based portfolios. Therefore, the avenue for diversification appears to be primarily through the use of different investment managers. There are some rare exceptions whereby a mutual fund combines investments in more traditional debt and equity securities with distressed securities. Exhibit 5 demonstrates the correlations between the ALTMAN-NYU Index and the other two risky asset classes - common stocks and high yield bonds. We see that the monthly return correlation is only 0.35 between risky defaulted debt and equities. Since defaulted debt holders usually end up owning the equity of the

**Exhibit 5: Correlation of ALTMAN-NYU Salomon Center Index of Defaulted Securities with Other Speculative Securities Indexes 1987-1994**

	Altman-NYU Salomon Center Index	S&P 500 Stock Index	Merrill Lynch High Yield Master Index
<b>Correlation of monthly returns:</b>			
ALTMAN-NYU Salomon Center Index	100.00%	35.29%	57.77%
S&P 500 Stock Index		100.00%	47.77%
Merrill Lynch High Yield Master Index			100.00%
<b>Correlation of quartely returns:</b>			
ALTMAN-NYU Salomon Center Index	100.00%	25.95%	63.68%
S&P 500 Stock Index		100.00%	44.45%
Merrill Lynch High Yield Master Index			100.00%

emerged Chapter 11 entity, unless they sell the debt just prior to emergence from restructuring, it is interesting to note the somewhat low correlation of returns between these two indexes. Furthermore, the quarterly correlations are even lower (0.26). The correlation between high yield bonds and defaulted bonds is considerably higher at about .60 (both monthly and quarterly). We believe this relatively high correlation is partially a function of the operating performance of firms in general, the outlook for risky companies and the overall confidence in the market for risky debt. While these correlations are quite high, it is also clear that the defaulted debt index is more volatile -in both good and bad years. This is not surprising since high yield debt has a base return equal to the interest payments received in each period while most defaulted debt trades "flat" (without interest receipts). In addition, there is a great deal of uncertainty about what the reorganization plan will specify and how each class of creditors will be treated - not to mention the possibility that the end-result will be a liquidation. Finally, there are several critical event dates during a bankruptcy reorganization, i.e., bankruptcy filing, post-default financing, filing of a reorganization plan and plan confirmation/liquidation, which can result in large swings in the price of debt issues.

We do observe that the relative volatility between defaulted debt and equity returns, when measured on a monthly basis, puts the former in a much more favorable light. This implies a greater degree of autocorrelation (strings of gains or losses) which can exacerbate annual return levels and volatility but not monthly return variability.

Exhibit 4 also shows that in above-average years (1987, 1988, 1991, and 1993), defaulted debt outperformed high yield debt, while in poor years (1989 and 1990), defaulted debt performed far worse.

### 7. Seasonality?

A curious pattern continued in 1994 concerning the monthly and quarterly returns of defaulted debt. In every year of our, admittedly short, eight-year data base, the best performing quarter came within the first six months of the year while the worst performing month and quarter were in the last six months. Indeed, the first quarter was the best in six out of the eight years, including 1994. In addition, the worst quarter was the last in five out of the eight years. These patterns may not be simply coincidental. Perhaps the generally poor end-of-year performan-

ce can be partly explained by the portfolio “clean-up” by managers. That is, unattractive vestiges of earlier-in-the-year bankruptcies are dumped by managers of high yield funds who do not want defaults in the portfolio at all. This, of course, presents some attractive opportunities for defaulted debt managers for above normal short term returns.

### Footnotes

- [1] For a discussion of formal default prediction models as well as a proposed method based on macroeconomic conditions and the existing credit and aged profile of the high yield debt market, see JONSSON and FRIDSON (1995).
- [2] See ALTMAN and KISHORE (1995) for the most recent mortality rate and loss figures.
- [3] See ROSENBERG (1992) for a fascinating description of vulture behavior and tactics. For a discussion of the merits of being patient in the reorganization period, see SWANK and ROTT (1995).
- [4] This index, originally called the ALTMAN-Merrill Lynch Index, is maintained and published on a monthly basis at the NYU Salomon Center of the Leonard N. Stern School of Business and is available via the Center as well on a number of electronic and other data services. For information on how to receive the monthly index, fax requests to Prof. ALTMAN, (212) 995-4220.

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