

Market Dynamics and Investment Performance of Distressed and Defaulted Debt Securities

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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 and the recent (1997-98) poor return performance to investors. This is primarily due to the expected growth in the supply of new distressed and defaulted public and private debt paper, the perception that prices are now at attractive levels and the documented relatively low correlation of returns with the more traditional debt and equity markets. This article 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 publicly 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 U.S. Treasuries. With interest rates falling as much as they have by late-1998, this definition would currently include bonds yielding at least 15.0%.

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 and most large securities firms have analysts, sales and trading personnel dedicated to this market and investors.

Supply of Distressed Securities

In my prior works (Altman 1992, 1996) 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. I will use an estimate of 2:4 to 1, approximately the mid-point between the two prior estimates for estimates in 1995 and 1998.

As of June 30, 1995, I estimated 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 June 1995 estimate of total public and private, defaulted and distressed debt was about \$100 billion (face) and \$64 billion (market). These figures include only domestic, U.S. debt.

Exhibit 1: Estimated Face and Market Values of Defaulted and Distressed Debt (1990-1998) (\$Billions)

	January 31, 1990		August 31, 1992		August 31, 1993		June 30, 1995		August 31, 1998	
	Face Value	Market Value	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	\$ 10.0	\$ 5.0
Distressed	50.0	33.0	28.4	16.5	15.6	9.4	13.3	8.0	13.0	7.8
Total Public	75.0	44.4	71.0	37.0	47.1	25.1	29.8	16.3	23.0	12.8
Private Debt:										
Defaulted	75.0 ¹	46.8	78.8 ²	47.3	75.6 ³	43.4	39.6 ³	23.8	23.0 ³	16.8 ⁴
Distressed	150.0 ¹	112.5	52.5 ²	39.4	37.4 ³	28.1	31.9 ³	23.9	31.2 ³	25.0 ⁵
Total Private	225.0	159.3	131.4	86.7	113.0	71.5	71.5	47.7	54.2	41.8
Total Public & Private	\$300.0	\$203.7	\$202.4	\$123.7	\$160.1	\$ 96.6	\$101.3	\$ 64.0	\$ 77.2	\$ 54.6

¹Assumes 3-to-1 ratio of private to public debt

²Assumes 1.85-to-1 ratio of private to public debt

³Assumes 2.4to-1 ratio of private to public debt

⁴Assumes 70% of face value

⁵Assumes 80% of face value

Source: E. Altman and B. Simon (1996) and updates, e.g., "Yield-to-Worst Rankings," Merrill Lynch & Company, monthly.

It appears that the 1998 totals are somewhat lower due to the benign credit cycle in the U.S. for the past five years (1993-1997), when default rates on public high yield bonds averaged less than 2% each year (**Exhibit 2**, Altman & Kishore, 1998). The supply of public, domestic defaulted bonds was about \$10 billion as of mid-1998 and our best estimate of distressed public debt is about \$13 billion. At the same time, we have noticed an increase in distressed securities in 1998. The resulting total of defaulted and distressed, public bonds and private debt as of end of August 1998 is about \$77 billion (face value) and \$55 billion (market value). The latter is impacted by recent estimates that bank loan defaults sell at about 70% of face value (Moody's, 1998); distressed debt is therefore higher at 80% of face value. The private component, e.g., bank loans, is definitely lower than it was in 1995. The flight-to-quality problems of August 1998, however, has resulted in a marked decrease in prices of all bank debt, especially in the distressed sector. And, with the tremendous growth in syndicated bank loans in 1996-1998 (mid-year), the potential supply of distressed private debt has definitely increased.

In summary the 1998 totals of distressed and defaulted debt in the U.S. is probably \$77 billion (face value). If we would include international debt, especially Asian loans and securities, this number is dramatically higher since in the first six months of 1998 alone, over \$2.5 billion of non-U.S., rated, public debt defaulted (see Moody's (1998) tabulations of domestic and international debt).

Future Supply of Distressed Debt

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. A 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.¹ Estimates, based on new issuance from 1971-1996 and defaults through 1997, are given in **Exhibit 3**.

Based on new issuance by bond rating from 1987-1996 and the mortality rate data in Exhibit 3, I estimate that new default totals will be approximately \$36.4 billion over the next three years (**Exhibit 4**). Due to the high proportion of senior bonds issued in the high yield debt market since 1990 - about 65 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 \$18.2 billion of new defaults over the period 1998-2000. These public defaults will probably be accompanied by new private defaulted debt face value totals of about \$87 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 \$124 billion (face value) and \$79 billion (market value). Incidentally, although these numbers look quite large, the resulting implied default rate in the U.S. high yield debt market is approximately 2.4% per year - still below the historical annual weighted average of 3.3% (Exhibit 2).

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).

Exhibit 4: Expected Supply of New Defaulted Debt (U.S. Only, 1998-2000)		
Debt Type	Defaulted Debt Par Value (\$Billion)	Defaulted Debt Market Value (\$Billion)
Public Straight Debt	\$36.42	\$18.21
Private Senior Debt*	\$87.42	\$61.19
Total	\$123.84	\$79.41
*Assumes private/public ratio of 2.4; market value at default at 0.60 of face value.		

Distressed Securities Investor Profile

Despite the fact that some distressed investors have abandoned the market in the last few 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 distressed securities managers who have different styles and preferences (e.g., active vs. passive investors -- see below).

The overwhelming majority of these investors 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;² (See Gilson (1995) for an overview of the market).

Since there is 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 required returns necessary. As we will show, however, the average performance in this market over the last 11 years, although good, has been considerably below the 20-25% per year range. The remainder of this chapter reports on the performance of defaulted bonds in the 1987-1998 period. While it still debatable to refer to distressed and defaulted debt securities as an asset class or market,³ especially in view to its diminished size in 1998, 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

² For a discussion of the merits of being patient in the reorganization period, see Swank and Rott (1995).

³ A new paper by F. Reilly, E. Altman and D. Wright (1998), "Including Defaulted Bonds in the Capital Market's Asset Spectrum," Financial Management Association, October 16, 1998 (Chicago), argues that defaulted securities are indeed a bona-fide asset class.

the current prices may be overly discounted due to the temporary distressed condition of the issuers.

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 30 different securities. The number of issues has been as high as 231 issues in 1992 and as of December 31, 1997 was comprised of 37 issues (33 companies) with a face value of \$5.9 billion and a market value of \$2.7 billion. The 1997 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

⁴ This 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.

vs. those firms and securities that have emerged from the Chapter 11 process. The trend toward a reduced size of the Index appears to have reversed in 1998 with defaults (\$3.7 billion, 26 issues) in the first six months, almost doubling the number in the comparable period of 1997. 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. Except in rare cases, none of the securities are making interest payments while in default and the performance is strictly based on price changes. Price values are derived from a number of dealer quotes. We either use the end of month transaction price or the mean of the bid - ask spread when no transaction takes place.

Due to the relatively long historical record of the A-NYU Index, its relatively large and comprehensive nature and its objective sources 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. Moody's recently (June 1998) unveiled their Bankrupt Bond Index and Salomon Smith Barney also publishes a bankrupt bond index.

In addition to our defaulted bond index, we also maintain an index of defaulted bank loans; this index was started in December 1995 = 100. A combined bond and bank loan index is also available.

1997 and 1998 Performance of Defaulted Bonds

1997 Performance

The Altman-NYU Salomon Center Index had a relatively poor year's performance in 1997, falling by 1.578%, the first negative year since 1990 (**Exhibit 5**). The overall performance of defaulted debt securities was considerably less than the total return of the S&P Common

Stock Index (+34.43% - assuming reinvestment of dividends) in 1997, and also below the Merrill Lynch High Yield Bond Master Index (+12.73%). In general, most risky fixed income securities did well in 1997 as spreads narrowed throughout the year. The longer duration, 10-year U.S. Government securities also performed well, reversing their poor 1996 performance. Defaulted securities, on the other hand, are not very sensitive to interest rate changes except as it affects the future earning power of the firm after it emerges (if it does) from reorganization.

1998 Performance

Through the first seven months of 1998, the defaulted bond index performed quite well, registering a total return of 5.10%. Similar results were achieved by our private bank loan index. The financial crisis in August changed everything. The carnage in the world's financial markets impacted all risky securities' performance and did not exclude defaulted and distressed debt. Indeed, our public bond index declined by an incredible 18.25% in one month, resulting in the worst single month's performance in the history of our index (the previous worst month was -8.92% in October 1987). Hence, the year-to-date performance was -13.15% as of August 31, 1998 (**Exhibit 5**). A similar decline in August was suffered by common stocks (-14.46%), indicating a high correlation in August between defaulted debt and stocks (see discussion below).

Since August, defaulted bonds continued its negative slide until November, when a turnaround started. As of the end of November, the Index was down about 25% for the year. The near-term outlook for risky debt remained quite uncertain as the world's economic and financial problems were still prominent. Further shocks, from Russia for example, political paralysis and the lack of liquidity were perhaps not completely discounted in prices. Still, the eventual value of a distressed claim is, to a great extent, particular to the restructured company. Although the subsequent price of equities of emerged firms will certainly depend upon the

duration of the bankruptcy and market conditions upon the emergence from Chapter 11, the main valuation ingredient is still the fundamental earning power of the firms' restructured assets and the distribution of new securities to the various old creditor classes and, in some cases, to the old equity. See our recent paper on the performance of equities of emerged companies (Eberhart, Altman & Aggarwal, 1997). In other words, investors should not be discouraged from continued investing in particular situations that appear attractive based on expected values and current prices.

Eleven Year Comparative Performance

In **Exhibit 5** we observe the return on defaulted bonds as well as common stocks and high yield bonds for the entire eleven-year sample period 1987-1997. Note that both the arithmetic average (12.49% per year) and the geometric average (10.62% per year) for defaulted bonds are considerably less than the S&P 500 (17.71% and 16.91%, respectively) and about the same as the high yield bond index 11.86% and 11.38%, respectively, for the same period. In five of the 11 years, defaulted bonds performed better than both of the other two indexes while in five years it performed the worst. And, the standard deviation is largest for defaulted bonds. On a monthly basis, however, the volatility comparison (as measured by the standard deviation of return) is considerably different with defaulted bond issues actually showing lower volatility (3.59%) than common stocks (4.21%) but considerably higher than high yield "junk" bonds (1.52%). This latter comparison is understandable since high yield bonds pay a fairly steady fixed interest each month while defaulted bonds do not.

Bank Loan Index

Our **Altman-NYU Salomon Center Index of Defaulted Bank Loans** is also a market weighted index and started with 18 facilities as of December 1995 and at the end of 1997 also

had 18 (falling from 23 a year earlier). As of the end of 1997, the Index had a face value of \$3.36 billion and \$2.39 billion in market value -- a market to face value of 0.71. This compares with a market to face value ratio of only 0.39 for our public bond index. The Bank Loan Index entails only senior debt, much of which is secured; the Bond index, discussed earlier, is a mix of senior and subordinated debt.

The performance of our Bank Loan Index was also quite poor in 1997, rising by only 1.75%. The two-year Defaulted Bank Loan return was 10.66%, considerably below the stock market's continued incredible performance and just below that of high yield bonds.

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. With a few exceptions, 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 (e.g., Mutual Shares Fund managed by Franklin Resources, Inc.

Exhibit 6 demonstrates the most recent correlations between the Altman-NYU Index and two other 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 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 .53 (both monthly and quarterly). We believe this moderate 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 fairly high, it is also clear that the defaulted debt index is more volatile - in both good and bad years.

Exhibit 6: Correlation of Altman-NYU Salomon Center Index of Defaulted Securities with Other Speculative Securities Indexes 1987-1998 (August)			
	Altman-NYU Salomon Center Index	S&P 500 Stock Index	Merrill Lynch High Yield Master Index
Correlation of monthly returns:			
Altman-NYU Salomon Center Index	100.00%	35.04%	53.48%
S&P 500 Stock Index		100.00%	53.45%
Merrill Lynch High Yield Master Index			100.00%

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.

Correlations in Exceptional Months

The correlations listed in **Exhibit 6** are for the entire period 1987-1998 (August). Since we observed such a dramatic decline in both the defaulted debt and common stock markets in August 1998, we thought it instructive to analyze the correlation between these two asset classes, and also with high yield bonds, when the stock market performs exceptionally well or poorly. We selected an arbitrary criterion of $\pm 5.0\%$ monthly return as a definition of an exceptional month. Over the 11 1/2 year sample period, there were 25 months when the stock market's performance exceeded this $\pm 5\%$ criteria (**Exhibit 7**). Note that there are six observations in 1987 and 1997, none during the period 1992-1995 and three so far in 1998. August 1998 stands-out as the biggest one month decline for all of our indexes except for the October 1987 stock market meltdown.

The correlations shown in **Exhibit 7**, for exceptional months, are all considerably higher than when measured over the entire 11 1/2-year period. For example, our defaulted bond index had a 0.59 correlation with the stock market compared to 0.35 for the entire period. And the S&P 500 Stock Index correlation with high yield bonds jumps from 0.53 to 0.68. This implies a type of contagion effect from the more liquid, and larger stock market to "fixed" income securities that are also perceived as risky and quite a bit less liquid.

Despite the higher correlations during exceptional months, we also observe that in 9 of 25 months, the stock market and defaulted bond market moved in opposite directions. This is in

Exhibit 7

Exceptional* Monthly Performance Comparisons (1987-1998)

Month	Bank Loan Index	Market Weighted Bond Index	S&P 500 Stock Index	Merrill Lynch High Yield Master Index
1 Jan-87		9.802%	13.470%	2.828%
2 Jun-87		2.897%	5.050%	1.382%
3 Jul-87		5.503%	5.070%	0.544%
4 Oct-87		-8.916%	-21.540%	-2.672%
5 Nov-87		3.215%	-8.240%	2.529%
6 Dec-87		7.534%	7.610%	1.328%
7 Jan-89		-4.468%	7.320%	1.500%
8 Apr-89		2.056%	5.190%	0.295%
9 Jul-89		2.462%	9.030%	0.474%
10 Jan-90		12.909%	-6.710%	-1.954%
11 May-90		-1.234%	9.750%	1.806%
12 Aug-90		-3.026%	-9.040%	-3.830%
13 Nov-90		-2.691%	6.460%	0.850%
14 Feb-91		8.486%	7.150%	7.423%
15 Dec-91		13.530%	11.437%	1.162%
16 Sep-96	0.791%	2.107%	5.628%	2.146%
17 Jan-97	1.879%	-1.544%	6.248%	0.517%
18 Apr-97	-6.627%	-2.132%	5.970%	1.138%
19 May-97	-1.933%	0.109%	6.880%	2.150%
20 Jul-97	0.453%	-0.228%	7.957%	2.400%
21 Aug--97	1.190%	2.267%	-5.602%	-0.175%
22 Sep-97	2.406%	1.639%	5.477%	1.656%
23 Feb-98	-0.843%	1.960%	7.212%	0.413%
24 Mar-98	1.677%	0.819%	5.121%	0.862%
25 Aug-98	-6.265%	-18.254%	-14.458%	-4.315%

*Stock Market Increase or Decline by more than 5% in a month.

Sources: Altman-NYU Salomon Center's Defaulted Bond and Bank Loans Indexes, Standard & Poor's Corp. and Merrill Lynch & Company

Contrast to the direction of the monthly correlations between the S&P 500 and high yield debt when in only two instances was the sign of the monthly return different. In the case of negative exceptional stock market months, however (5 instances), only once did the defaulted bond market increase (August 1997).

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