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The Investment Performance of Defaulted Bonds For 1994 and 1987-1994

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REPORT ON

**THE INVESTMENT PERFORMANCE OF DEFAULTED
BONDS FOR 1994 AND 1987-1994**

By

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Report Overview

This report presents a discussion of the investment performance of those bond issues that have defaulted and continue trading in the public market while the issuing firm attempts a financial reorganization. Monthly total returns measures are compiled based on the Altman-NYU Salomon Center Index of Defaulted Debt Securities and compared with the total returns of common stocks and high yield bonds. Returns based on our market weighted index are presented for the past year, 1994, as well as the eight year period 1987-1994. While 1994 was at best a modest year of performance for defaulted bonds, these securities performed very well compared to our two other risky indexes and to risk free government bonds. The superior return performance of defaulted bonds is also manifest for the eight year sample period. The volatility of this portfolio is greater than that of our comparable indexes. Diversification and seasonal movements are also analyzed in this report. Finally, future supply and demand estimates for the defaulted and distressed market are discussed.

Introduction

This report on the performance of defaulted bonds continues our annual update and analysis of this unique investment category. For more in-depth discussions of the supply and demand elements of defaulted and distressed securities, as well as its performance, see Altman (1990, 1991, 1992 and 1993) as well as Altman and Eberhart (1994) and Ward and Griepentrog (1993). 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 1994, 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 and greater price appreciation 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.

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.¹ The

¹This 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.

Index starts in December 1986=100 and as of December 31, 1994 was comprised of 93 issues (35 companies) with a market value of \$3.3 billion and a face value of its component securities of \$6.3 billion. The 1994 totals are considerably reduced from the 151 issues (77 companies), with market value of \$5.8 billion and a face value of \$11.8 billion, at the end of 1993.

The A-NYU Index includes securities of companies at various stages of the 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 determinants of the performance of defaulted debt for specific periods, i.e., from issuance to emergence. (Note that the A-NYU Index does not include convertible issues).

1994 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. The Index level rose from 235.8 at the end of 1993 to 251.5 at the end of 1994. 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)! **Exhibit 1** shows the monthly returns in 1994 for the Index calculated with and without Western Union. Note that the differences were pronounced in February and in September through November.

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."

If one measures the performance of defaulted debt securities excluding the Western Union influence, then the negative -2.45% return is very much in line, if not worst, than the other two speculative security classes (stocks and high yield bonds).

Eight Year Comparative Performance

In **Exhibit 2** we observed 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.

Exhibit 3 graphs the monthly index levels for our three security classes for the entire eight year period. In September 1994, for the first time since October 1989, the defaulted debt index level rose above both of the others, exceeding the S&P 500 common stock index level. The higher volatility period for defaulted bonds was clearly in the earlier years of our time series, 1987-1989.

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 defaulted 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.²

Exhibit 4 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 .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 (.26).

The correlation between high yield bonds and defaulted bonds is quite high at about .60 (both monthly and quarterly). We believe the 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

²There are some rare exceptions whereby a mutual fund combines investments in more traditional debt and equity securities with distressed securities.

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 2 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.

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 (**Exhibit 5**). 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 performance 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.

Is there a January effect caused by the end-of-year poor performance and tax-selling? Perhaps not, since January was the best performing month only in 1992 and 1993, second best in 1987 and 1994 and overall a positive month in six of the eight years. On the other hand, the first quarter was a stellar period, producing the best quarterly performance in six of the eight years. While these results are striking and invite further study, we cannot say more at this point without investigating the performance of the individual firms' issues.

Outlook for the Supply and Demand of Distressed Securities

For this report, we have not done a survey of investment managers who specialize in distressed and defaulted securities. We do observe, however, that there has been a reduction in the

size of the public and private distressed debt market and this is most clear in the considerable diminution in the size of our defaulted debt index. Recall that the market value of our index in 1994 fell by 43% from \$5.8 billion to \$3.3 billion and the number of issues dropped from 151 to 93 (38%). The supply of new defaults clearly did not keep pace with those that have emerged in one form or another from their distressed restructuring status. Exhibit 6 shows that the high yield default rate in 1994 was 1.45%, slightly up from 1993 but considerably below the 4.2% average annual rate for the last 24 years. The number of public defaults was only 24 issues, considerably below the number of issues leaving default status.

As for the future, we expect the market for distressed and defaulted securities to increase, probably starting in 1995. Although the overall U.S. economy continues to be relatively robust, the huge new issue supply of non-investment grade debt in the last three years of \$126 billion, combined with recent higher interest rates, should result in an increase of default amounts in the coming years. While we do not expect default rates and numbers to approach the record years of 1990 and 1991, or even to reach the weighted average levels of 1991-1994, the net supply of distressed and defaulted issues will almost certainly increase. This is partially a function of the considerable number of existing defaults that have emerged in the last year as well as the increased supply of new defaults.

Further on the subject of expected defaults, we can observe

in Exhibit 7 that the marginal increases in the mortality rates of high yield bonds (Altman and Kishore, 1995) is substantial in the third year for BB rated issues and in the second year for single-B's and CCCs. The "grace" period for our recent low rated cohort new issues is now about finished and the coming years will likely see increased defaults. Actually, we are a bit surprised that this increase did not manifest more dramatically in 1994!

Finally, investment managers in the distressed arena are increasingly shifting their emphasis, at least of late, to the non-public and non-U.S. areas. While data as to the supply of these securities and the volume of trading do not exist for obvious reasons, there is little doubt that investors who have the abilities and resources have shifted some of their investments to these less efficient and potentially more profitable distressed markets. One could predict, in addition, that the recent chaos in the truly emerging country markets, like Mexico, will also present new opportunities for distressed securities investors who are willing to explore such new markets.

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Exhibit 1

Monthly Performance in 1994 of the Defaulted Debt Index With and Without Western Union Bonds

| <u>Month</u> | <u>Return With Western Union</u> | <u>Return Without Western Union</u> |
|------------------|--------------------------------------|---|
| January | +1.43% | +1.38% |
| February | +3.20 | +0.09 |
| March | +0.76 | +0.87 |
| April | -2.04 | -2.27 |
| May | +1.19 | +1.32 |
| June | -1.06 | -1.24 |
| July | +0.47 | +0.48 |
| August | +0.74 | +0.87 |
| September | +1.40 | -0.59 |
| October | +0.29 | -0.62 |
| November | +0.50 | -2.50 |
| December | -0.30 | -0.19 |
| Full Year | <u>+6.66%</u> | <u>-2.45%</u> |

EXHIBIT 2

ALTMAN-NYU SALOMON CENTER INDEX OF DEFAULTED DEBT SECURITIES AND OTHER SPECULATIVE SECURITIES INDEXES

Comparison of Returns (1987 - 1994)

| Year | Altman-NYU Salomon Center Index (Mkt. 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% |
| <hr/> | | | |
| 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% |
| <hr style="border-top: 1px dashed black;"/> | | | |
| 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% |

EXHIBIT 3

DEFAULTED DEBT, STOCK AND HIGH YIELD BOND INDEXES
1987 - 1994

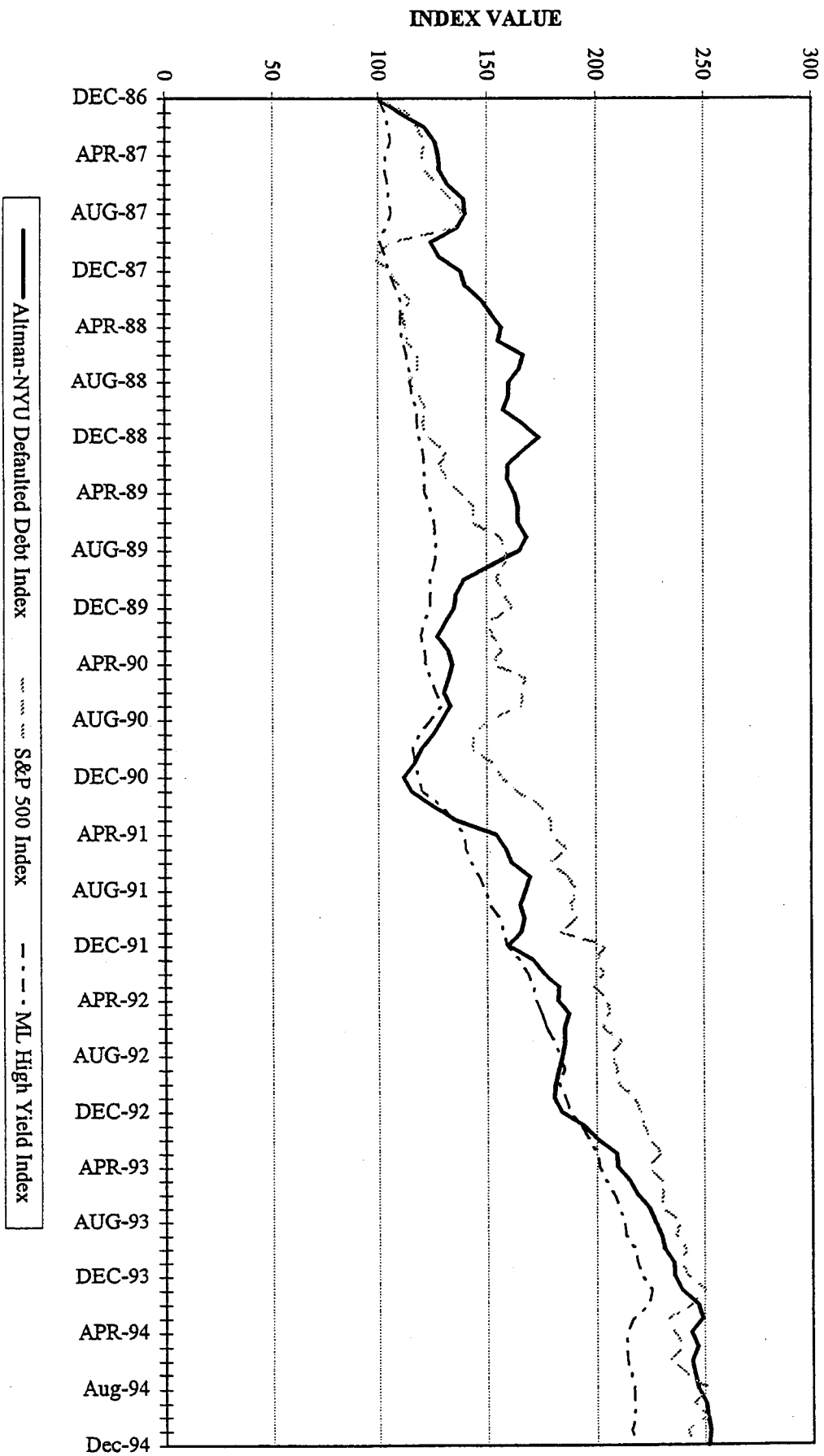


EXHIBIT 4

CORRELATION OF ALTMAN-NYU SALOMON CENTER INDEX OF DEFAULTED SECURITIES WITH OTHER SPECULATIVE SECURITIES INDEXES 1987 - 1994

CORRELATION OF MONTHLY RETURNS

| | Altman-NYU Salomon Center Index | S&P 500 Stock Index | Merrill Lynch High Yield Master Index |
|---------------------------------------|---------------------------------------|------------------------|---|
| 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% |

CORRELATION OF QUARTERLY RETURNS

| | Altman-NYU Salomon Center Index | S&P 500 Stock Index | Merrill Lynch High Yield Master Index |
|---------------------------------------|---------------------------------------|------------------------|---|
| 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% |

EXHIBIT 5

MONTHLY AND QUARTERLY RETURNS FOR THE ALTMAN-NYU SALOMON CENTER INDEX OF DEFAULTED SECURITIES

| Month | 1987 | Rank | 1988 | Rank | 1989 | Rank | 1990 | Rank | 1991 | Rank | 1992 | Rank | 1993 | Rank | 1994 | Rank | Up | Down |
|--------|--------|------|--------|------|---------|------|---------|------|--------|------|--------|------|--------|------|--------|------|-----|------|
| Jan | 9.80% | 2 | 1.44% | 7 | -4.47% | 10 | -2.91% | 8 | 3.18% | 5 | 7.06% | 1 | 5.55% | 1 | 1.43% | 2 | 6/8 | 2/8 |
| Feb | 10.53% | 1 | 5.44% | 3 | -3.99% | 9 | -2.83% | 7 | 8.49% | 3 | 3.21% | 3 | 3.09% | 3 | 3.20% | 1 | 6/8 | 2/8 |
| Mar | 3.77% | 5 | 3.10% | 6 | -0.21% | 5 | 3.98% | 1 | 8.50% | 2 | 3.90% | 2 | 4.16% | 2 | 0.76% | 5 | 7/8 | 1/8 |
| Apr | 1.25% | 8 | 3.18% | 5 | 2.06% | 2 | 1.48% | 3 | 13.62% | 1 | -0.27% | 7 | 0.27% | 11 | -2.04% | 12 | 6/8 | 2/8 |
| May | 0.44% | 10 | -0.91% | 9 | 1.01% | 3 | -1.23% | 4 | 2.99% | 6 | 2.57% | 4 | 2.54% | 5 | 1.19% | 4 | 6/8 | 2/8 |
| Jun | 2.90% | 7 | 7.41% | 1 | -0.09% | 4 | -1.71% | 5 | 1.66% | 7 | -1.05% | 12 | 1.80% | 6 | -1.06% | 11 | 4/8 | 4/8 |
| Jul | 5.50% | 4 | -1.14% | 10 | 2.46% | 1 | 2.29% | 2 | 5.39% | 4 | 0.25% | 6 | 2.55% | 4 | 0.47% | 8 | 7/8 | 1/8 |
| Aug | 0.52% | 9 | -2.82% | 12 | -2.06% | 7 | -3.03% | 10 | -1.30% | 10 | -0.72% | 9 | 1.13% | 9 | 0.74% | 6 | 3/8 | 5/8 |
| Sep | -2.45% | 11 | -0.07% | 8 | -7.84% | 11 | -2.99% | 9 | -1.45% | 11 | -0.93% | 11 | 1.30% | 8 | 1.40% | 3 | 2/8 | 6/8 |
| Oct | -8.92% | 12 | -1.61% | 11 | -8.40% | 12 | -4.28% | 12 | 1.08% | 8 | -0.82% | 10 | 0.64% | 10 | 0.29% | 9 | 3/8 | 5/8 |
| Nov | 3.22% | 6 | 5.83% | 2 | -2.64% | 8 | -2.69% | 6 | -0.92% | 9 | -0.41% | 8 | 1.76% | 7 | 0.50% | 7 | 4/8 | 4/8 |
| Dec | 7.53% | 3 | 4.48% | 4 | -0.70% | 6 | -4.27% | 11 | -3.53% | 12 | 1.97% | 5 | 0.23% | 12 | -0.30% | 10 | 4/8 | 4/8 |
| 1st Q | 5.95% | 1 | 10.28% | 1 | -8.47% | 3 | -1.90% | 2 | 21.45% | 1 | 14.79% | 1 | 13.33% | 1 | 5.47% | 1 | 6/8 | 2/8 |
| 2nd Q | 4.65% | 2 | 9.82% | 2 | 3.00% | 1 | -1.49% | 1 | 18.96% | 2 | 1.21% | 2 | 4.67% | 3 | -1.93% | 4 | 6/8 | 2/8 |
| 3rd Q | 3.46% | 3 | -3.99% | 4 | -7.51% | 2 | -3.77% | 3 | 2.51% | 3 | -1.39% | 4 | 5.06% | 2 | 2.63% | 2 | 4/8 | 4/8 |
| 4th Q | 1.10% | 4 | 8.78% | 3 | -11.44% | 4 | -10.83% | 4 | -3.38% | 4 | 0.72% | 3 | 2.65% | 4 | 0.48% | 3 | 5/8 | 3/8 |
| Annual | 7.85% | | 26.49% | | -22.78% | | -17.08% | | 43.11% | | 15.39% | | 27.91% | | 6.66% | | 6/8 | 2/8 |

EXHIBIT 6

HISTORICAL DEFAULT RATES - STRAIGHT DEBT ONLY DEFAULTED ISSUES EXCLUDED IN PAR VALUE OUTSTANDING 1971-1994 (\$ MILLIONS)

| <u>YEAR</u> | <u>PAR VALUE OUTSTANDING</u> | <u>PAR VALUE DEFAULTS</u> | <u>DEFAULT RATES</u> | |
|--|----------------------------------|-------------------------------|--------------------------|-------------------------------|
| 1994 | \$235,000 | \$3,418 (c/d) | 1.454% (c/d) | |
| 1993 | 206,907 | 2,287 | 1.105% | |
| 1992 | 163,000 | 5,545 | 3.402% | |
| 1991 | 183,600 | 18,862 | 10.273% | |
| 1990 | 181,000 | 18,354 | 10.140% | |
| 1989 | 189,258 | 8,110 | 4.285% | |
| 1988 | 148,187 | 3,944 | 2.662% | |
| 1987 | 129,557 | 7,486 (a) | 5.778% (a) | |
| 1986 | 90,243 | 3,156 | 3.497% | |
| 1985 | 58,088 | 992 | 1.708% | |
| 1984 | 40,939 | 344 | 0.840% | |
| 1983 | 27,492 | 301 | 1.095% | |
| 1982 | 18,109 | 577 | 3.186% | |
| 1981 | 17,115 | 27 | 0.158% | |
| 1980 | 14,935 | 224 | 1.500% | |
| 1979 | 10,356 | 20 | 0.193% | |
| 1978 | 8,946 | 119 | 1.330% | |
| 1977 | 8,157 | 381 | 4.671% | |
| 1976 | 7,735 | 30 | 0.388% | |
| 1975 | 7,471 | 204 | 2.731% | |
| 1974 | 10,894 | 123 | 1.129% | |
| 1973 | 7,824 | 49 | 0.626% | |
| 1972 | 6,928 | 193 | 2.786% | |
| 1971 | 6,602 | 82 | 1.242% | |
| | | | | Standard Deviation |
| ARITHMETIC AVERAGE DEFAULT RATE | | | 1971 TO 1994 | 2.758% |
| | | | 1978 TO 1994 | 2.672% |
| | | | 1985 TO 1994 | 2.976% |
| WEIGHTED AVERAGE DEFAULT RATE | | | 1971 TO 1994 | 4.208% |
| | | | 1978 TO 1994 | 3.424% |
| | | | 1985 TO 1994 | 3.438% |
| MEDIAN ANNUAL DEFAULT RATE | | | 1971 TO 1994 | 1.604% |

Notes

(a) \$1,841.7 million without Texaco, Inc., Texaco Capital, and Texaco N.V.
The default rate is 1.345%

(b) Weighted by par value of amount outstanding for each year

(c) Includes Grand Union debt of \$1,631 million and Trans World Airlines debt of \$231 million in 1994 defaults;
if both were not included, the default rate would be 0.64%.

(d) Amount of defaults in 1994 adjusted for accreted values of two Grand Union issues and the original discounted trading values of the two TWA issues.

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 | 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 | 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 | 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 | 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 | 0.50% | 0.58% | 4.15% | 4.84% | 1.13% | 0.52% | 2.69% | 0.27% | 0.79% | 0.78% |
| Cumulative | 0.50% | 1.08% | 5.19% | 9.78% | 10.79% | 11.26% | 13.64% | 13.87% | 14.55% | 15.21% |
| B | 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 | 8.32% | 10.69% | 18.53% | 10.26% | 9.18% | 5.56% | 2.49% | 2.97% | 12.28% | 0.00% |
| Cumulative | 8.32% | 18.13% | 33.30% | 40.14% | 45.63% | 48.66% | 49.94% | 51.42% | 57.39% | 57.39% |

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