

**RISKS AND RETURNS OF LOW-GRADE  
BONDS: AN UPDATE**

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## **Abstract**

This paper updates previous analyses of the risks and returns of low-grade bonds to include 1990, a year during which the low-grade bond market experienced dramatic changes. The annual return of 8.7 percent for low-grade bonds over the 1977-1990 period is lower than the returns on long-term Treasury bonds, long-term corporate bonds, the S&P 500 or small stocks over the same span. Much of this poor relative performance can be traced to the 1989-1990 period when low-grade bonds realized an average annual loss of 5.4 percent. During this same period, small stock prices also fell dramatically. The high degree of correlation between the returns of low-grade bonds and small stocks during the entire period of analysis, but especially in the latter half of 1990, suggests that a factor common to both small stocks and low-grade bonds can explain a significant portion of the losses of low-grade bonds over this latter period.

This paper reports on the risks and returns of low-grade bonds using a data base of dealer bid prices analyzed in Blume and Keim (1987) and Blume, Keim and Patel (1991).<sup>1</sup> That data extends through 1989, and we update it here through 1990. We briefly describe the data sources, and then compare the risks and returns of low-grade bonds to the risks and returns of other indexes of stocks and bonds, with particular emphasis placed on the 1989-1990 period during which the low-grade bond market experienced dramatic changes.

### **The Low-Grade Bond Data**

The low-grade bond returns are drawn from four different sources. The primary source is a data base of low-grade prices covering the years 1982 to 1988.<sup>2</sup> These prices are month-end bid prices from Drexel Burnham Lambert and Salomon Brothers. The specific bonds included in the analysis satisfy the following criteria: (1) face value at time of issue is greater than \$25 million; (2) the bonds are not convertible; and (3) time to maturity is at least ten years from the date on which a return is calculated. As of December 1988, the average maturity of our sample is 14.7 years.

To provide a longer historical perspective, we augmented our basic data with additional data before 1982 and after 1988. Prior to 1982, we collected month-end prices for the 1977-81 period for *all* bonds rated below BBB listed in the *S&P Bond Guide* satisfying the same three conditions as the 1982-88 sample. Although these data may theoretically not be as reliable as

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<sup>1</sup>In a recent paper, Cornell and Green (1991) use returns for low-grade bond (open end) mutual funds to estimate the risks and returns of low-grade bonds. Their results are comparable to those reported below.

<sup>2</sup>See Blume and Keim (1987) for a detailed description of this data base, which at the time covered the years 1982 to 1986.

the Drexel and Salomon data, they do extend the sample back to 1977 -- the beginning of the modern low-grade bond market -- and some analysis reported previously [Blume and Keim (1987)] does suggest that indexes based on these prices are reliable. For 1989, the monthly index returns are the returns of a long-term index developed by Drexel. Drexel (1989) adopted virtually the same criteria that we imposed for the 1982-88 data in the construction of this index, and the Drexel index is thus comparable to the pre-1989 index. The 1990 returns are computed using the Salomon Brothers Long-Term High Yield Bond Index. Table 1 contains the monthly returns of the entire series from January 1977 to December 1990.

For comparison, we also report results below for several stock and bond indices as published by Ibbotson Associates. The stock market indices are the S&P 500 and a value-weighted portfolio of NYSE and AMEX stocks in the smallest quintile of size as measured for the NYSE stocks only. The long-term high-grade corporate bond index is identical to the Salomon Brothers index of the same name. The long-term government bond index has a maturity of roughly 20 years and is derived by Ibbotson Associates from data in the *Wall Street Journal*.

### **Risks and Returns of Low-Grade Bonds**

From 1977 through 1990, low-grade bonds realized a compounded annual rate of return of 8.7 percent (Table 2 and Figure 1), which was lower than the returns for long-term Treasury bonds (9.1 percent), long-term high-grade corporate bonds (9.4 percent), the S&P 500 (13.3 percent) and the index of small stocks (16.7 percent). The years 1989 and 1990 were turbulent ones for the low-grade bond market. In 1990 alone, the total return on low-grade bonds was a loss of 8.6 percent return. If we exclude 1990 from the averages, low-grade bonds realized a compounded annual rate of return of 10.2 percent, which was higher than the returns for long-

term Treasury bonds (9.3 percent) and high-grade bonds (9.7 percent), but lower than the S&P 500 (14.6 percent) and small stocks (20.3 percent).

In both periods reported in Table 2, the estimated standard deviation of the monthly low-grade bond returns is less than that for any of the other four categories of assets. Blume, Keim and Patel (1991) argue that the reasons for the low volatility of the low-grade bonds relative to the other bond portfolios are the greater coupons and the call features of low-grade bonds that reduce their duration and, therefore, their sensitivity to interest rate movements.<sup>3</sup>

Analysis of the correlations among the asset categories in table 2 shows that low-grade bonds exhibit some of the characteristics of high-grade bonds and some of the characteristics of stocks. From 1977 through 1990, the correlation between low-grade bonds and long-term Treasury bonds is substantially less than the correlation between long-term high-grade corporates and Treasury bonds -- 0.67 and 0.95 respectively (Table 2). The correlation between low-grade bonds and small stocks is substantially greater than the correlation between long-term high-grade corporates and small stocks--0.53 and 0.20 respectively. The correlations for the 1977-1989 subperiod are similar. Thus, low-grade bonds possess some of the characteristics of Treasury bonds but also some of the characteristics of small stocks. Moreover, the importance of Treasury bonds and small stocks in explaining the returns of low-grade bonds varies over time. (Figure 2) As such, analysis of expected returns for low-grade bonds is complicated by the fact that the "risk" of these bonds must capture sensitivity to both interest rate and equity fluctuations, and we currently have no models that explicitly account for both of these influences.

Understanding this hybrid nature of low-grade bonds is critical to understanding the behavior of low-grade bond prices over the last two years. The popular press in 1989 and 1990

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<sup>3</sup>Blume, Keim and Patel (1991) demonstrate that a government bond index properly adjusted for these greater coupons and call features is less volatile than the low-grade bond index.

contained many reports describing the turbulence in the market for low-grade bonds. The dominant underwriter and market maker Drexel Burnham Lambert was in serious financial trouble and would ultimately declare bankruptcy in February 1990. As a result of new investment restrictions placed on them by Congress in the August 1989 bailout bill, many savings and loan associations were forced to begin selling off their large holdings of low-grade bonds. In June 1990, the National Association of Insurance Commissioners tightened its guidelines regarding low-grade bond investments by life insurance companies, which own about 30 percent of all low-grade bonds. The poor returns of low-grade bond during this period -- particularly in the latter half of 1990 (figure 3) -- has often been attributed to these events.

Indeed, during 1989-1990, low-grade bonds realized an annualized loss of 5.4 percent, while many other types of assets realized substantial positive returns. Of the other four asset groups in table 2, three had positive annualized returns over the two-year period: S&P 500 (12.8 percent), Treasury bonds (11.97 percent) and high-grade bonds (11.41 percent). Interestingly, small stocks experienced a negative return (-7.0 percent) during these two years, and the behavior of small stock prices mimicked the behavior of low-grade bonds. The fall in low-grade bond prices following June 1990 is a mirror image of the fall in small stock prices during this same period (figure 3). The similar losses on small stocks and low-grade bonds in the latter half of 1990 suggests that a factor common to both small stocks and low-grade bonds explains a significant portion of the losses of low-grade bonds over these months. To be sure, there may have been some unique events that affected only the returns on low-grade bonds; but such unique events, if they existed, would explain only a portion of the loss on low-grade bonds. Although the data available do not permit a precise separation of the loss of low-grade bonds in the latter half of 1990 into these two effects, it is interesting to note that both low-grade bonds

and small stocks had substantial rallies in the first half of 1991 -- 22.3 percent for the Salomon Long-Term Low-Grade Index and 28.7 percent for the small stock index described above.

### **Conclusion**

From 1977 through 1989, the realized returns on long-term low-grade bonds exceeded the realized returns on both long-term high-grade corporate and long-term government bonds. Adding the poor returns that low-grade bonds realized in 1990 to these years reverses the relative ranking of realized returns. Importantly, with or without the inclusion of 1990, the volatility of long-term low-grade bonds over these 13 or 14 years is less than the volatility of high-grade corporate or government bonds. This lower volatility is consistent with the shorter duration of the low-grade bonds in comparison with the other bonds.



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Table 1

## Monthly Returns (Percent) for Low-Grade Bond Index

These returns are based on several indexes. From 1977 to 1988, the bonds underlying the index are all non-convertible with face value at time of issue of greater than \$25 million and with time to maturity of at least ten years from the date on which a return is calculated. The returns for the individual bonds from 1982 through 1988 are based on bid prices from Drexel Burnham Lambert and Salomon Brothers and prior to 1982 on prices from the S&P BOND GUIDE. The return indexes from 1977 through 1988 are averages of these returns by month. For 1989, Drexel calculated a monthly return index using bid prices in virtually the same way as the 1977-1988 indexes were calculated, and this index was used to extend the sample through 1989. The 1990 returns are computed using the Salomon Brothers Long-Term High Yield Index.

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1977	2.20	1.90	0.00	0.90	1.80	3.30	-0.30	0.30	-1.60	0.20	2.30	0.10
1978	-1.30	0.30	1.30	0.00	-1.10	1.00	1.20	2.90	0.70	-5.80	0.80	-1.20
1979	5.10	-0.10	2.00	0.50	0.50	1.80	0.90	0.80	-2.10	-8.10	3.20	-1.20
1980	-1.30	-6.00	-5.70	13.00	6.60	3.30	-1.90	-2.30	-1.30	0.40	-1.20	-1.00
1981	2.80	-1.20	2.00	-0.70	0.50	3.80	-3.10	-2.20	-2.90	3.50	8.40	-2.50
1982	-1.85	1.36	0.63	2.47	2.11	-1.08	4.30	8.67	3.76	4.62	2.71	1.29
1983	5.48	4.09	4.07	3.99	-2.32	-0.51	-1.61	0.94	2.42	1.10	1.29	-0.41
1984	3.76	-1.30	-1.05	-0.94	-4.60	1.20	3.05	2.05	4.00	2.88	0.67	-0.09
1985	3.91	1.17	0.81	1.38	4.43	0.87	0.23	1.55	0.56	0.30	2.44	3.17
1986	0.64	3.33	2.57	2.36	-0.89	3.06	-2.90	1.68	1.08	1.36	0.30	0.43
1987	4.04	2.15	0.23	-3.00	-0.27	0.65	-0.27	1.61	-3.82	-2.74	2.14	1.65
1988	4.10	3.59	-1.03	0.67	0.70	3.09	1.10	0.39	2.27	1.29	0.14	0.39
1989	2.03	0.21	-0.47	-0.05	1.24	2.26	0.00	-0.39	-1.79	-5.70	0.38	0.31
1990	-3.72	-1.67	0.22	0.15	2.98	1.74	2.35	-5.14	-6.63	-3.87	3.64	1.66

Table 2

## Summary Statistics of Returns for Various Asset Categories

	Annual	Monthly		Correlations of Monthly Returns			
	Geometric Mean	Mean Return	Standard Deviation(1)	High-Grade Bonds	Low-Grade Bonds	S&P 500	Small Stocks
A. 1/1977 to 12/1990							
Long-term Government Bonds	9.1%	0.79%	3.92%	0.95	0.67	0.37	0.21
High-Grade Bonds	9.4	0.81	3.81		0.72	0.34	0.20
Low-Grade Bonds	8.7	0.74	3.31			0.52	0.53
S&P 500 Stocks	13.3	1.15	4.78				0.81
Small Stocks	16.7	1.47	6.48				
B. 1/1977 to 12/1989							
Long-term Government Bonds	9.3	0.81	3.96	0.95	0.68	0.34	0.21
High-Grade Bonds	9.7	0.83	3.91		0.75	0.32	0.19
Low-Grade Bonds	10.2	0.85	3.16			0.48	0.52
S&P 500 Stocks	14.6	1.25	4.68				0.81
Small Stocks	20.3	1.72	6.21				

(1) The standard deviations are adjusted for first order autocorrelation in security returns that can result from infrequent trading and which can bias downward the estimated standard deviation.

Figure 1

# MAJOR MARKET INDEXES

DECEMBER 1977 THRU DECEMBER 1990

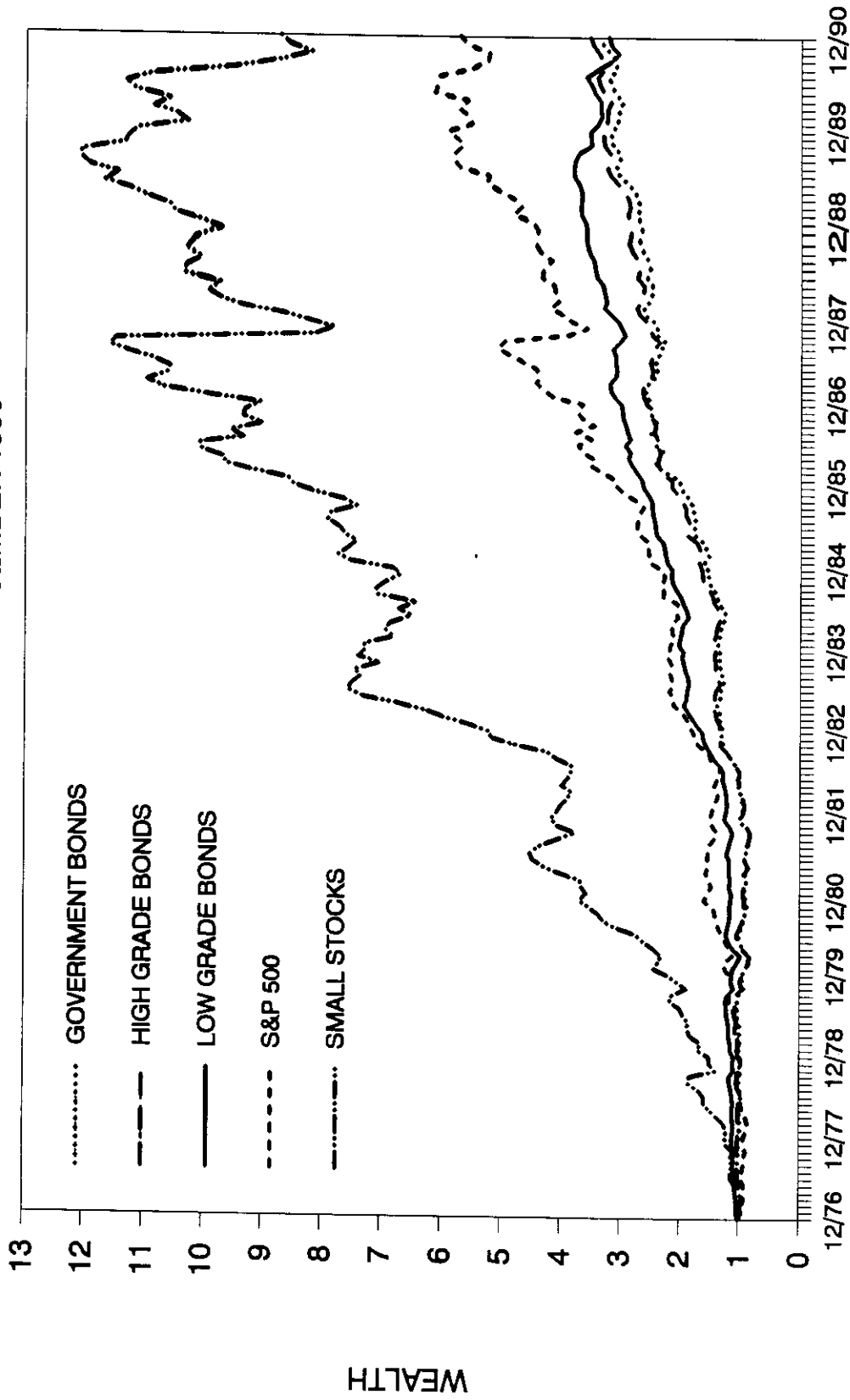


Figure 2

# CORRELATIONS OF LOW-GRADE BONDS

WITH TREASURY BONDS AND SMALL STOCKS

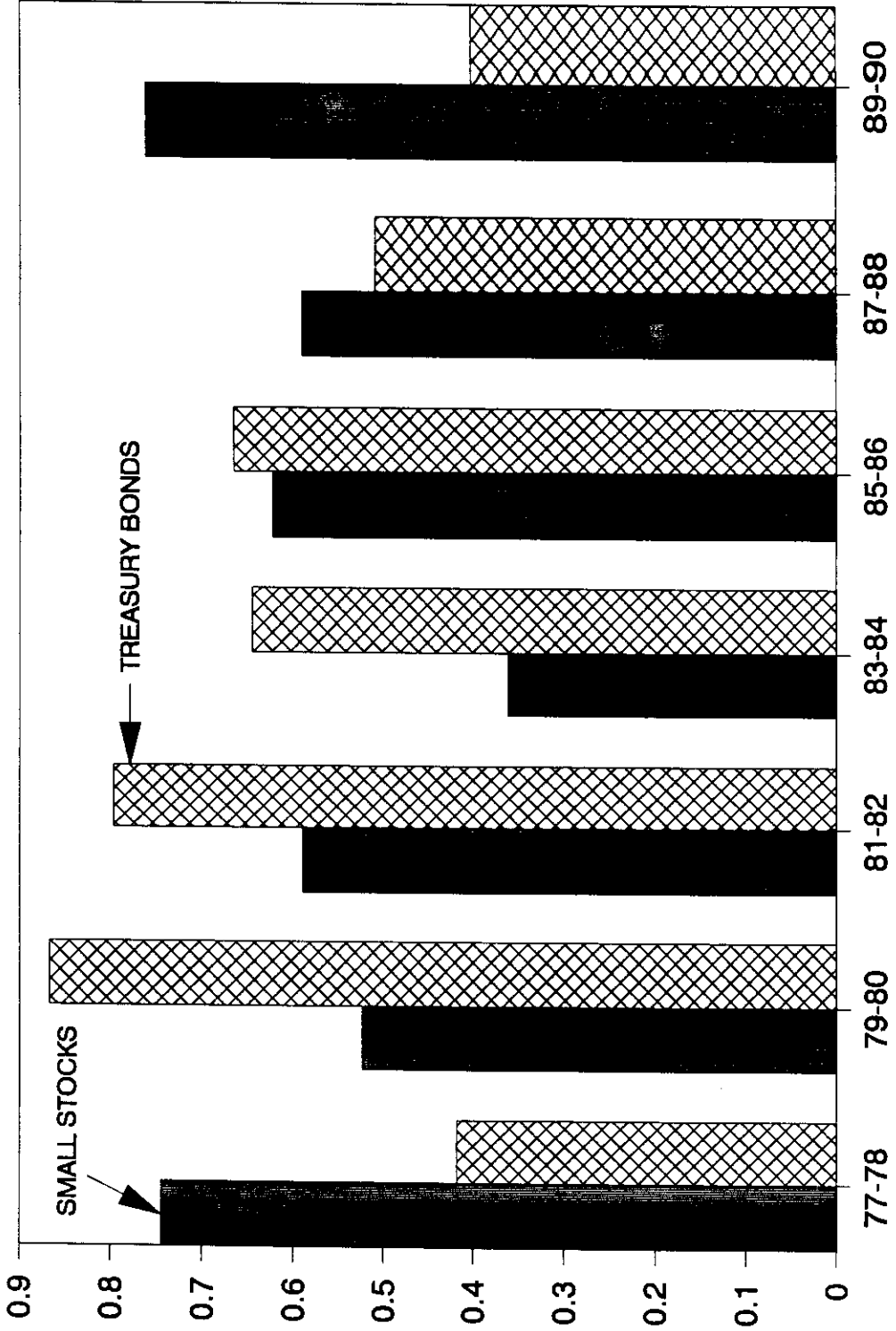


Figure 3

# MAJOR MARKET INDEXES

