Recent behavior of the risk structure of bond yields

In recent years the financial markets have been buffeted by a variety of shocks. the Penn Central crisis in 1970, the oil embargo in 1973, the failure of Bankhaus Herstatt and the Franklin National Bank in 1974, the financial problems in New York City and New York State All these disturbances affected market confidence in various ways, and some of them significantly increased the interest yields required to sell risky bonds relative to those of less risky bonds

Bonds that are similar in all respects except for their creditworthiness (risk of default) differ in yield, and these differences in yield constitute the risk structure of bond rates. No single yield spread represents adequately the diversity of risk structures in the bond market as a whole Movements of yield spreads on various types of bonds during the past several years illustrate the contrasting ways in which different risk structures can behave. For example, the spread between the yield on Moody's seasoned Baa-rated industrial bonds and the yield on seasoned Aaa industrial bonds reached a post-World War II peak in January 1976 at 193 basis points (1.93 percentage points). Since then, it declined to 101 basis points by early July of this year The Baa-Aaa spread for seasoned utility bonds peaked a year earlier in January 1975 at 258 basis points and has declined to 90 basis points In contrast, the Baa-Aaa spread for new municipal bonds peaked less than a year ago in August 1976 and is down to 80 basis points

The risk structure, on any measure, is generally believed to vary with the business cycle Conventionally, it is thought that spreads tend to narrow during recoveries and to increase during recessions as investors reassess the relative creditworthiness of bonds in light of changing economic developments Although the movement of risk structures during the recent recovery broadly conforms to this pattern, there have been substantial differences in behavior between different sectors of the bond market.

In part, these differences reflect investors' changing assessments of the relative riskiness of different corporations and different municipalities. The yields observed in the bond market, however, like prices in any other market, are also determined by the interactions of supply and demand While investors' perceptions of the risk differentials between various issues have an important influence on the structure of rates, supply forces may also have an influence If, for example, the supply of new issues of high-quality bonds is small relative to the supply of new issues of lower quality bonds, the yield on the high-quality bonds would probably decline relative to the yield on lower quality bonds until a new equilibrium in the rate structure is reached In this case, a widening of the yield spread between lower and high-quality bonds would not indicate that investors had become more concerned about the creditworthiness of lower quality issues.

At the same time, of course, issuers react to market yields by controlling their supplies of bonds to minimize their financing costs. The result of this interdependence of the yields and the quantities of bonds marketed is that it is often difficult to determine to

what extent changes in relative supplies are influencing yield spreads and to what extent changing risk appraisals are doing so.[1]

The measurement problem

Measurement of the risk structure of bond yields involves several conceptual difficulties.

The conventional way of comparing bonds with different coupons and due dates is to use the yield to maturity, but this approach has important limitations. It makes no distinction between interest income from coupons and their reinvestment and the implicit interest income that arises when a bond sells at a discount. Since capital gains income is taxed at preferential rates, this distinction is important when determining the aftertax rate of return on bonds. And in calculating the yield to maturity, all coupons are assumed to be reinvested at the current yield to maturity. In practice, future reinvestment yields are highly uncertain, so that the return on a high coupon bond over time is riskier than that on a low coupon bond.

Clearly, then, to the extent that yields on future reinvestments differ from the current yield, bonds selling at par and those selling at discounts below par, or at premiums above par, are not comparable even if they have identical maturities, call protection, and present yields. This naturally creates some imprecision when using yields to maturity to calculate rate spreads.

In addition, there are difficulties in using composite indexes of yields to maturity on bonds in a given quality category (e.g., Moody's composite yields) to measure the risk structure. Unless the bonds in the category are truly homogenous in terms of creditworthiness—an ideal which can only be approximated —the representativeness of the composite may be distorted by variation in the quality of the issues of which it is made up.[2]

These problems are important to keep in mind when discussing the behavior of the risk structure. But they principally affect narrow comparisons, especially those between yields on bonds of similar quality. They are less important for comparisons of yields on bonds of widely different quality, for example, those on Baa bonds with those on Aaa bonds.

The risk structures of industrial bonds, utility bonds, and municipal bonds are displayed in the accompanying charts that cover the period from 1953 through the second quarter of this year. Cursory inspection reveals that the tendency for the yield spreads to increase during recessions and to decline during recoveries is not uniform for the three sectors. In considerable part, this behavior is due to various disturbances which have left their marks on the risk structure in recent years.

Industrial bonds

The risk structure of industrial bonds is shown in the middle panel of Chart 1. To a much greater extent than in other sectors, the striking association between peaks of the Baa-Aaa yield spread on industrial bonds and periods of recession accords with the view that yield spreads narrow during recoveries and widen during recessions. There also appears to be an upward trend in the Baa-Aaa spread. Closer inspection shows that it is largely due to the wide spreads of 1970-71 and 1975-76, both of them periods that include or immediately follow recessions when yield spreads ought to have increased. Considering that the most recent recession was the severest in the postwar period, there would appear to be little evidence of a trend in the industrial Baa-Aaa spread.

While movements of the Baa-Aaa spread seem to conform to recessions and recoveries, there is substantial lack of conformity at certain times, suggesting that other forces not cyclical in nature may be at work For example, the spread began to decline two quarters before the end of the 1957-58 recession This may well have been due to the fact that, in the second and third quarters of 1958, a great many new issues of high-quality industrial bonds (Aaa and Aa) appeared, so that the Aaa industrial bond rate rose 43 basis points during the two quarters while the Baa rate was almost unchanged, leading to a marked decline in the Baa-Aaa spread.

During the first half of the sixties, bond rates were quite stable, and the Baa-Aaa spread drifted slowly downward until early 1966. At that point, bond rates started to rise sharply in reaction to inflationary pressures and a tightening monetary policy. The spread increased sharply as well. With the onset of the 1969-70 recession, the spread advanced to levels previously seen during the 1957-58 and 1960-61 recessions.

In part, the sharp increase in the Baa-Aaa spread in 1970 was in accord with the pattern observed in previous recessions Since the spread surpassed earlier recessionary levels, however, even though the

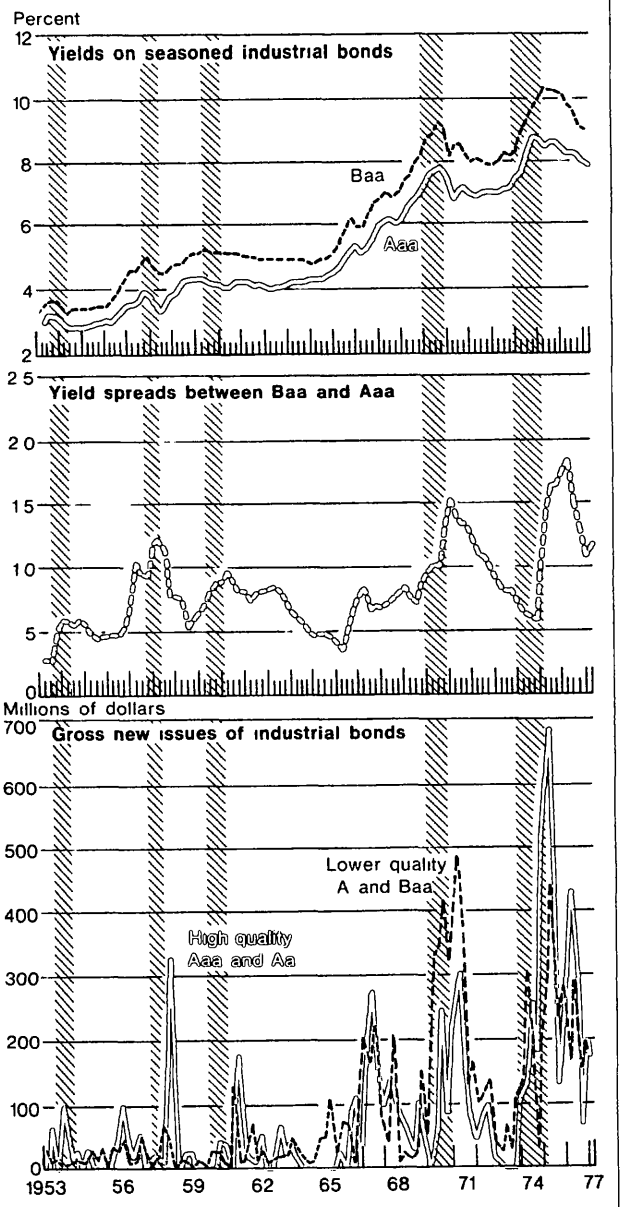
[1] There are also serious problems of data availability For example, data broken down by market sector and by rating category are available only for gross new issues of bonds, although new issues net of retirements would be a more appropriate indicator of changes in supplies

[2] This problem is aggravated by the fact that to keep the average maturity of the composite reasonably constant requires continual revision of the sample of bonds in the composite Changes in quality ratings of individual bond issues may also alter the sample Moreover, Moody's composite yields are based on bond prices on the New York Stock Exchange and may be unrealistic if the bonds used in the index are traded infrequently on the Exchange

Chart 1

Industrial Bonds

Yields and new issues



Shaded areas represent periods of recession as defined by the National Bureau of Economic Research

Source Moody's Investors Service

1969-70 recession was the mildest of the postwar period, other forces also seem to have assisted the advance. One factor was fear of a liquidity crisis after the financial collapse of the Penn Central railroad in June 1970 In addition, though issues of both high-quality (Aaa and Aa) and lower quality (A and Baa) bonds increased markedly during this period, the supply of lower quality issues outstripped the supply of high-quality issues from the first quarter of 1970 through the first quarter of 1971 Consequently, investors were confronted with a mix of new issues of considerably lower average quality than prevailed during the fifties and sixties

The Baa-Aaa spread declined from roughly the end of 1970 to the end of 1974. Over this period as a whole, the Baa rate changed little while the Aaa rate advanced. What is curious about the latter part of the period is that the spread continued to decline for three quarters into the 1973-75 recession as the Aaa rate rose faster than the Baa rate. This decline greatly contrasted with its behavior during earlier postwar recessions Part of the explanation may be that new issues of high-quality industrial bonds increased a good deal in 1974 after remaining at low levels during 1973, and this increase may have delayed a rise in the spread Additionally, the bond market may have been slow in perceiving the recession, because many economic indicators did not begin to deteriorate as early as is usual in an economic downturn.

Beginning in the fourth quarter of 1974, however, the spread increased abruptly, as the Aaa rate started to decline gently while the Baa rate moved sharply upward. Given the severity of the most recent recession, the steep increase in the yield spread is not surprising. The recession exposed a number of weaknesses in the financial structure of corporations and increased public awareness of the deterioration in their liquidity and capital positions The failure rate of corporations rose considerably during the 1974-75 period, highlighted by the bankruptcy of one of the nation's leading retail firms

The Baa-Aaa spread peaked in the first quarter of 1976—a full four quarters after the end of the recession Since then, the Baa-Aaa spread has declined a good deal The economic recovery has continued and corporations have greatly improved their balance-sheet positions, thus restoring investor confidence.

Utility bonds

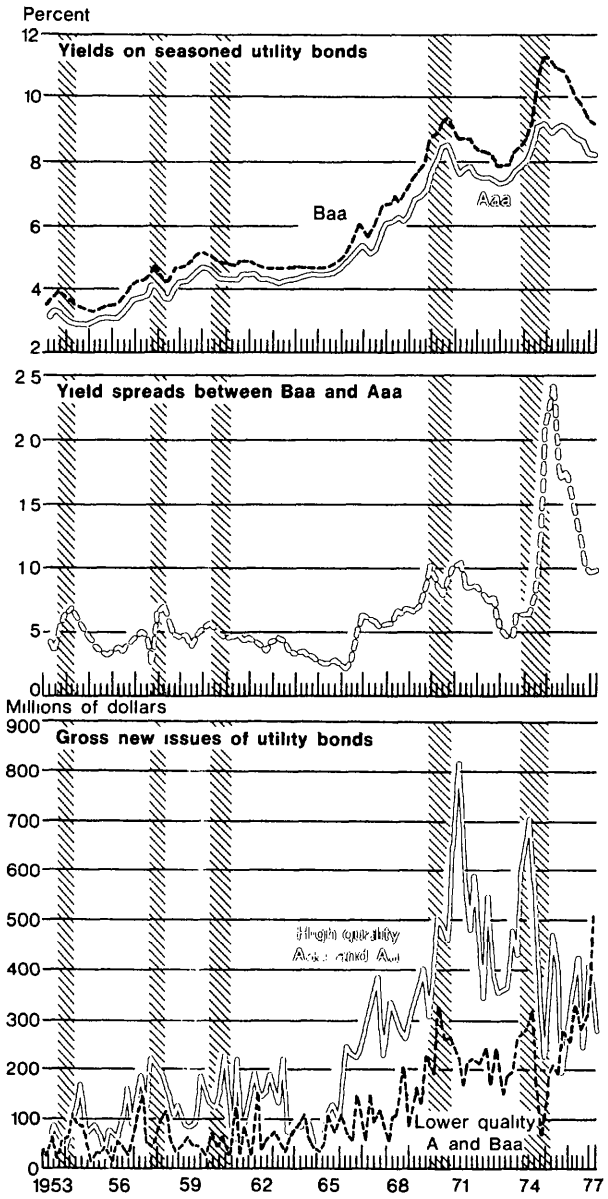
The risk structure of utility bonds is shown in Chart 2. The Baa-Aaa spread displays a positive trend, but this is due in large part to the wide spreads of 1970-71 and especially 1974-76, as was the case for industrial bonds.

One of the striking contrasts between the utility and

Chart 2

Utility Bonds

Yields and new issues



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Source Moody's Investors Service

industrial risk structures is that, prior to 1966, the utility risk structure showed little cyclical variation while the industrial risk structure displayed a pronounced conformity to the business cycle. During this period, issues of high-quality utility bonds generally exceeded issues of lower quality bonds, but the differences were not great In particular, the small supply of both high- and lower quality issues of utility bonds from the second half of 1963 through the end of 1965 probably contributed to the gradual decline of the Baa-Aaa spread during this period.

The downward drift of the spread terminated abruptly in 1966, when yields rose significantly and the volume of issues of high-quality bonds greatly surpassed that of lower quality issues This imbalance prevailed through the second quarter of 1975. While it would be expected that larger supplies of high-quality bonds would have had a depressing effect on the Baa-Aaa spread, in fact the spread increased greatly beginning in 1966 and peaked in early 1971. It is possible that the high levels of yields required to float lower quality utility bonds inhibited their issue during much of the 1966-75 period

During the 1969-70 period, in contrast to the industrial sector, supplies of lower quality utility issues did not rise enough to equal those of high-quality issues. Lower quality issues did increase, however, and this probably put some degree of upward pressure on the Baa-Aaa utility spread More important was the large excess of lower quality industrial bond issues, compared with the large excess of high-quality utility bond issues during this period. These different supply patterns seem to help explain why the industrial Baa-Aaa spread was about 50 basis points wider than the utility Baa-Aaa spread when both peaked in early 1971

Falling capacity utilization in the electric utility industry following the oil embargo and the sharp runup in energy prices in late 1973 had a special effect on yield spreads among utility bonds The drop in utilization, in conjunction with investor concern about the adequacy of fuel supplies, must have contributed substantially to the rapid increase in the Baa-Aaa spread in late 1974 and early 1975[3] Since then, the effect of

[3] Telephone company bonds constitute a large proportion of Aaa-rated utility bonds, so that their yields have a large weight in the composite Aaa utility yield Inclusion of these bond yields in the Aaa composite may make the Aaa group somewhat unrepresentative of bond yields on other utilities, which were much more severely affected by the fuel crisis than telephone companies To see how unrepresentative the Baa-Aaa spread might be, the spread of the Baa yield over the Aa yield was calculated (Aa-rated utilities by and large do not include telephone companies and mostly include electric utility companies) The Baa-Aa spread turns out to behave very much like the Baa-Aaa spread so that the latter seems to picture adequately the behavior of the utility yield spread during the period examined

lower capacity operation as well as the effect of less than projected demand for electricity undoubtedly has been mitigated somewhat through rate relief from regulatory agencies. As a result, the utility Baa-Aaa spread has narrowed considerably after reaching its peak in the first quarter of 1975. Although the utility spread peaked at a much higher level than the industrial Baa-Aaa spread, it began to decline rapidly a full year before the industrial spread did, so that both have been of roughly equivalent magnitude during 1975-77.

Municipal bonds

The market for state and local government bonds—municipals—is affected by a set of factors different from those that influence the risk structure of the corporate sectors. While strength or weakness in the local economy can affect the general ability of state and local governments to service their debt, there has been little cyclical movement in the municipal risk structure in the postwar period. The greatest movement has occurred in the last several years as a result of the financial problems affecting several large state and local governments.

The middle panel of Chart 3 displays the risk structure of municipal bond yields. The Baa-Aaa spread was in a downward trend from approximately the middle of the 1950's until the middle of the 1960's. There is some suggestion that the recessions of 1957-58 and 1960-61 increased the spread somewhat, but overall there is little relation to business cycles during the period covered in the chart.

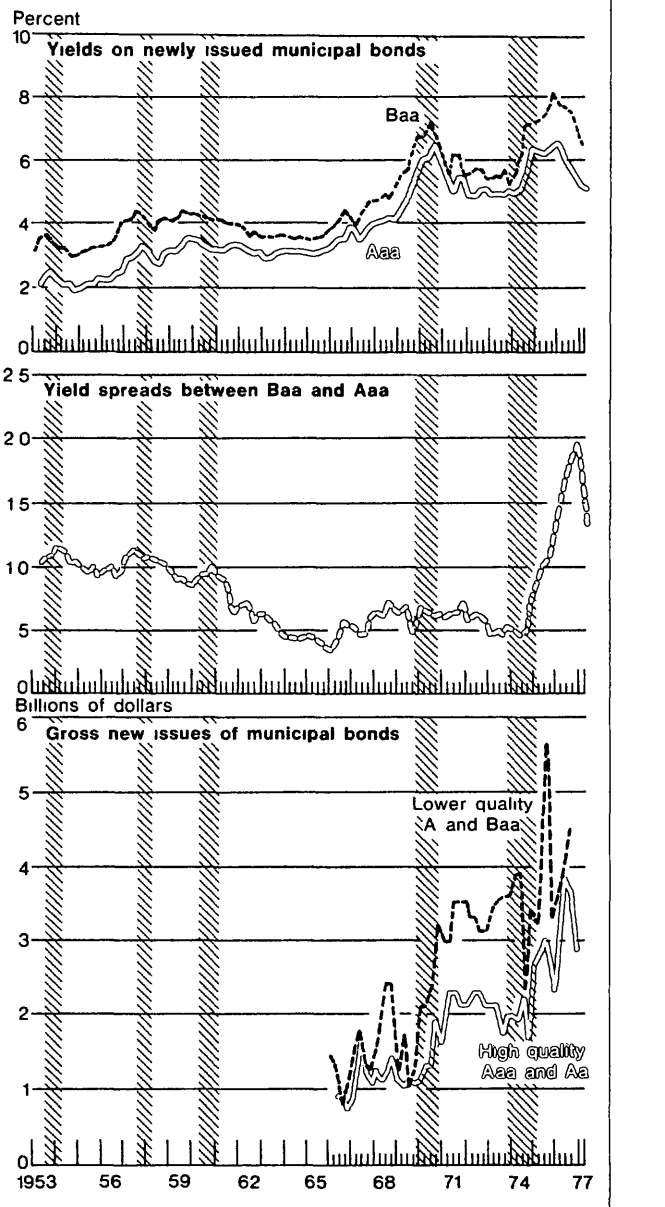
The major change in the risk structure started in late 1974, when the Baa-Aaa spread began a rapid rise. It was about this time that investors began to realize the magnitude of the financial problems facing New York City. In early 1975, when the city found itself unable to roll over maturing short-term debt, the spread increased still further. While a variety of emergency measures were being taken to prevent a default by the city, investors became aware that a number of other municipalities also were faced with serious financial difficulties This additional uncertainty fueled further increases in the Baa-Aaa spread until it reached by far the highest level of the postwar period.

The Baa-Aaa spread finally began to decline in late 1976 and fell sharply in early 1977. Probably the most important factors responsible for the decline were the more conservative approaches many municipalities, including New York City, began applying to their budgets, as well as the improvement in their underlying financial conditions. In addition, the narrowing of the spread was assisted by a court decision in November 1976 that prohibited New York City from continuing its

Chart 3

Municipal Bonds

Yields and new issues



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Sources Moody's Investors Service and Securities Industry Association

moratorium on repayments of principal to holders of certain of the city's notes. Another decision in April of this year upheld the constitutionality of the Municipal Assistance Corporation (MAC) for the City of New York.[4] The market was also buoyed by an April decision of the United States Supreme Court that reaffirmed an existing covenant in bonds previously issued by the Port Authority of New York and New Jersey. This decision was interpreted as increasing the value of a covenant and thus contributed to general market confidence. In May the ratings of some MAC and New York City bonds were raised by Moody's.

Other factors supporting the municipal bond market include recent changes in tax laws. As of the beginning of 1977, several channels of tax avoidance were closed to individual taxpayers, and this reform drew relatively more investments to tax-exempt municipal obligations. In addition, the recent rapid growth of tax-exempt bond funds, which make investment in municipals much more attractive to middle-income and upper income individuals, had the same effect.

A look ahead

In recent years the risk structures of yields on industrial, utility, and state and local government bonds have behaved rather differently. There are two principal reasons. First, the risk structure in the industrial sector appears to be much more sensitive to the business cycle than those in the utility and municipal sectors. And—importantly—recent shocks to the financial markets have apparently affected the risk structures of the various sectors of the bond market in different ways

It might, nevertheless, be expected that rate spreads will narrow as the present recovery proceeds, but the outlook may not be that easy to appraise. For one thing, capacity utilization of utilities remains extraordinarily low and, to the extent that economic recovery does not restore this utilization rate to something approximating pre-1973 levels, the risk structure of utility bonds presumably will not return to the smaller rate spreads which prevailed in the 1960's. And, while the economic recovery ultimately will assist state and local governments to service their debts more easily, the problems of many of the nation's older urban centers are too complex to warrant a clear prediction of the effect of prosperity on the risk structure of municipal bonds.

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[4] The Municipal Assistance Corporation for the City of New York, a corporate governmental agency and instrumentality of the State of New York, was created in June 1975 for the purposes of assisting the city in providing essential services to its inhabitants without interruption and of reestablishing investor confidence in the soundness of the obligations of the city To carry out these purposes, MAC is empowered, among its duties, to issue and sell bonds and notes and to pay or lend funds received from any such sale to the city and to exchange MAC obligations for obligations of the city