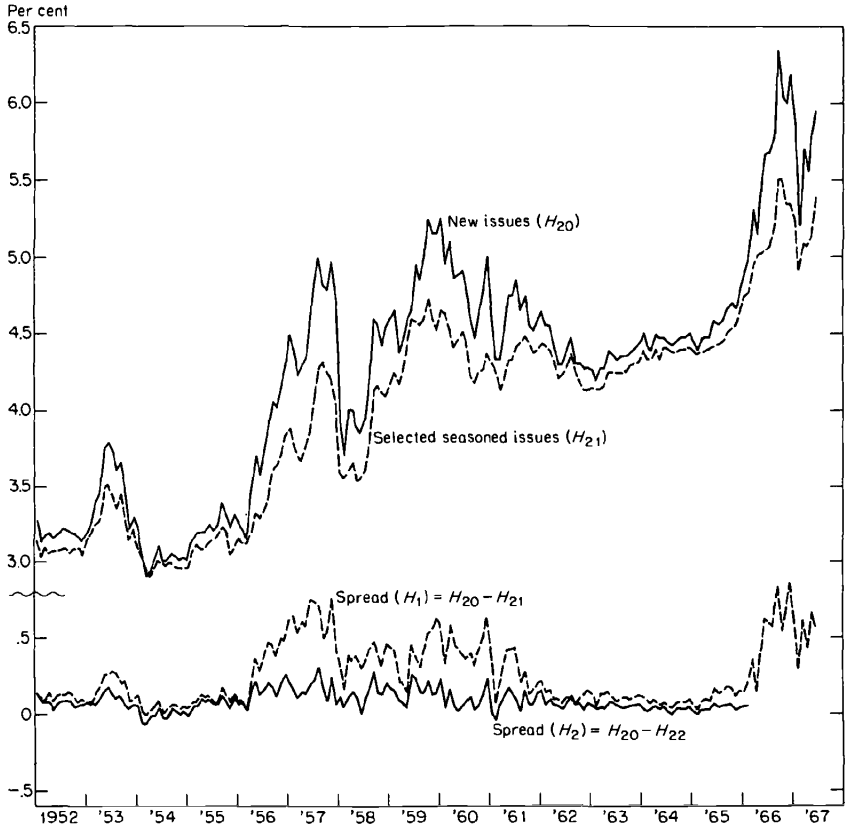
CHART 5-2. Homer New Issue Aa and Homer-Frankena Seasoned Issue Aa-Aaa Utility Bond Yields and Yield Spreads



NOTE: H_{21} is yield on seasoned issues with coupon rate of $2\frac{3}{4}$–$2\frac{7}{8}$ per cent. H_{22} is yield on issues with coupon rate equal to that on new issues.

long distribution period reduces the number of issues they can underwrite. As a consequence, underwriters may bid low for new issues and, to assure rapid distribution, set yields higher than those on comparable seasoned issues.

This tendency to set relatively high yields on new issues might be accentuated if underwriters foresaw difficulties in distributing new issues, for example, if yields were expected to rise in the near future, or if the total volume of new issues to be marketed in the period were abnormally large, or if recent new issues had been selling slowly.

Other studies have indicated that expectations of yield change are

based on an extrapolation of yield changes in the recent past.[25] This can be rationalized on the grounds that there is a strong cyclical pattern in interest rate series, which are based on business conditions and monetary and fiscal policy decisions, which are themselves related to business conditions. There is, of course, an opposite tendency, basic to the Keynesian "speculative motive" for holding cash balances: When yields have been rising for some time they may be viewed as high relative to some "normal" interest rate, and the market may therefore expect yields to fall back toward normal. However, the two forces are not mutually exclusive, since when yields are rising one may expect them to keep rising in the immediate future despite the expectation that over some longer period they will return to the "normal" level.[26]

In response to our inquiry on the tendency of underwriters to extrapolate recent yield charges, Sidney Homer writes that "there is no question that in bear bond markets underwriters are timid, bid low, and aim at immediate resale, whereas in rising markets or complacent markets (protracted stability) they bid high and are content with slow sale. This is why the spreads of the seasoned market narrow in good markets, widen in weak markets. It has indeed been occasionally true that new issue bids are dropped 2 to 4 points when dealers fear a further decline in the market. . . . Protracted discouragement is evident in the wide spreads of November 1957 and October 1959." [27]

The volume of new issues might also influence the bidding and pricing policies of underwriters. When the volume of new offerings rises, the market may become congested. The difficulty of selling new issues and the competition for buyers may force sellers to provide increasing yield advantages on new over seasoned issues.

Similarly, the speed with which recent new issues were sold might influence bidding and pricing by underwriters. If recent new issues have been moving very slowly and inventories are building up, underwriters might bid lower for additional issues and offer them at more attractive yields. However, we would expect both new issue volume and the rapidity with which recent issues have sold to be correlated with yield changes, so it is not altogether clear that either factor would

[25] See David Meiselman, *The Term Structure of Interest Rates,* Englewood, N.J., 1962, p. 18 and footnote.

[26] See Franco Modigliani and Richard Sutch, "Innovations in Interest Rate Policy," *American Economic Review, Papers and Proceedings,* May 1966, pp. 178–197, for a model which combines the extrapolative and regressive expectations hypotheses.

[27] Homer, July 20, 1965 Letter.

provide additional information after yield changes are taken into account.

Underwriters could also be influenced by the interest rates they pay on funds borrowed to carry new issues. Reliance on bank credit to finance bond inventories makes it more expensive and difficult in a tight money market for dealers to obtain funds for the purchase and distribution of newly issued securities. This might increase the pressure on underwriters to distribute new issues as rapidly as possible by pricing them attractively. Tightness in the money market might be measured by the level of short-term rates, the level of free reserves, or by the yield spread between long-term and short-term securities. The spread would be a rough measure of the cost to underwriters of carrying their inventories.[28]

One aspect of underwriting risks has not been considered thus far. Clearly underwriting risks are greatest on new issues, where the size of the inventories held is very large. But dealers who trade in seasoned bonds also assume a risk by holding an inventory and, by analogy to the argument concerning underwriting risks on new issues, might adjust the bid-asked price difference on seasoned bonds in response to the same factors which would make underwriters adjust their bids and offering prices on new issues.

Three spot checks were made to test the possibility that bid-asked spreads on seasoned bonds may be increased in periods of rising yields. Each check was a comparison of the bid-asked price spreads for all bonds common to the quotation sheets of a dealer on two different dates. One date in each comparison was in a period of rising yields and the other was in a period of falling yields.[29] We compared the bid-asked spreads on the quotation sheets of Salomon Brothers and Hutzler for August 1, 1957, a trading day in a period of rising yields, and January 2, 1958, a day in a period of falling yields. Out of 114 bonds common to the two sheets, 38 showed no change in bid-asked spread, 59 showed increases, and 17 showed decreases. The aggregate net change in the bid-asked spreads for all bonds taken together was an increase of $22\frac{1}{8}$ points—the equivalent of about 1 basis point in the average spread over the 114 issues.

Similarly, we compared the spreads on January 2, 1958, a day in a

[28] The cost is given by holding period yields, which equal yields to maturity only if interest rates do not change.

[29] The days chosen for this test were within broad cyclical phases of rise and decline in yields, and in each case were preceded by at least four consecutive weeks of rise or decline in weekly averages.

period of falling yields, and September 2, 1958, a day in a period of rising yields. Out of ninety-three bonds common to the two sheets, thirty-five showed no change in bid-asked spread, thirty-four showed increases, and twenty-four showed decreases. The aggregate net change in the bid-asked spreads was an increase of $4\frac{5}{8}$ points, the equivalent of less than 1 basis point in average spread.

Finally, we compared the bid-asked spreads on the quotation sheets of The First Boston Corporation for October 1, 1959, a day in a period of rising yields, and April 4, 1960, a day in a period of falling yields. Out of ninety-eight bonds common to the two sheets, forty showed no change in the size of the bid-asked spread, twenty-one showed increases, and thirty-seven showed decreases. The aggregate net change in the bid-asked spreads was a decrease of $11\frac{1}{8}$ points, again the equivalent of less than 1 basis point.

These spot checks show that bid-asked spreads do change, but the change is not related to the direction of change of yields, and the quantitative importance of the changes over any large sample of outstanding issues is very small. It appears that factors affecting underwriting risk would have a very small effect on the bid-ask spread on outstanding issues.

Imperfections in the Capital Markets: Lags in the Movement of Seasoned Yields. Finally, there are explanations for new-seasoned yield spreads which imply imperfections in the capital markets. As shall be noted later, spreads on individual new issues decline over a period of two or three months following the release of the issues from the syndicate. Neither of the two yield-spread hypotheses advanced above explains this finding. If yield spreads were based entirely on differences in the yield-determining characteristics of the bonds included in the averages, the spread on individual issues would have little tendency to decline after release from the syndicate. If yield spreads were based entirely on underwriting risk, on the other hand, market forces might be expected to eliminate yield spreads on individual issues in days instead of months.

For example, suppose a large volume of new issues forces new issue bond prices down and yields up. Why shouldn't holders of seasoned bonds immediately sell their holdings and shift into the more attractive new bonds, thereby reducing the price and increasing the yield on seasoned bonds? If holders of seasoned bonds are not fully aware of the current developments in the new issue market (which seems unlikely) or are not willing to take action, why do no arbitrageurs enter the market for new issues and immediately equalize rates on similar

new and seasoned bonds? Evidently actions of these kinds do not occur, at least not on the scale necessary to eliminate yield differentials quickly. Finally, why would any investor acquire seasoned issues at yields which are less attractive than those currently available on new issues?

Holders of seasoned bonds may not switch into new issues with slightly higher yields because of the transaction costs involved in such an operation (e.g., the dealer's commission represented by the bid-asked spread); such behavior would not imply market imperfections.[30] It is clear, however, that transaction costs do not provide a full explanation of the failure of arbitrageurs to equalize new and seasoned yields, since new-seasoned spreads for bonds with the same coupon rate are often considerably greater than recorded bid-asked spreads. Many of the other explanations for the failure to make portfolio changes can be regarded as forms of market imperfection.

Another reason holders of seasoned bonds may not switch into new issues is simply that they are not in the business of day-to-day speculation. Institutions such as life insurance companies and pension funds invest for income and usually hold to maturity. Homer writes that "the giant funds, with a few exceptions, have felt themselves to be largely frozen into their bond portfolios. They consider that their investment activity must be confined largely to the investment of their huge annual flow of new money. This problem is so stupendous that there is little room left for portfolio changes. Perhaps many smaller funds have sacrificed the advantages given them by their smaller size and have followed a similar policy of ignoring desirable portfolio changes."[31]

Because bonds are carried and amortized on the basis of cost, investors may be discouraged from a profitable switch by the reluctance to acknowledge capital losses (the "locked-in" effect). Homer writes that "one of the most powerful forces preventing arbitrage is the fact that almost all institutions carry bonds at amortized cost and, when prices are low, they would realize an enormous loss by selling. My observation is that only a tiny percentage are willing to realize these

[30] As mentioned before, Brimmer found that in September 1958 the average differential between the yields calculated from the bid and asked prices for the bonds used in Moody's seasoned issue yield series was about 9 basis points, and our examination of the public utility quotation sheets of Salomon Brothers and Hutzler and The First Boston Corporation for the period 1957–64 indicates bid-asked yield differentials of about 3 to 13 basis points on individual long-term seasoned bonds.

[31] Sidney Homer, "A Dynamic Approach to Institutional Bond Investment," Salomon Brothers and Hutzler, New York, 1961, pp. 16–17.

losses. If they did it in a substantial way, capital would be entirely wiped out for many." [32]

Another limitation on switching is that institutional investors often work under restrictions such as requirements for committee authorization and a variety of inflexible conventions and procedures.

Investors may acquire seasoned issues at yields below those on new issues because of features of specific issues. All Aas are not perfect substitutes in the eyes of individual buyers. Either diversification or concentration may be sought, and these objectives may not be satisfied by the relatively few new issues available. Homer says that "a few institutions would even buy the higher priced issue just to round out their previous holding or because they had a committee authority in the old issue and not in the new," [33] or we may add in order to average down the cost of an issue being held. Certain buyers, including those buying for pension funds, show a preference for seasoned issues which have been tested by the market as opposed to apparently comparable new issues. The difference in the size of the transactions involved in the new and seasoned market no doubt plays a role as well.

The market for seasoned bonds, furthermore, may be so thin that the attempt to sell any sizable amount would immediately wipe out the yield differential by driving down prices of seasoned issues. Homer writes that "the secondary market for most corporate bonds is not good enough to permit the portfolio manager to make every block transaction (at the quoted price) that may appeal to him. My experience is that about three-fourths of the desired switches can be made at fair prices in a portfolio when the unit of holding is 50 bonds, about half when the unit is 100–200 bonds, and a third when the unit is 500–1000 bonds. . . . For funds with blocks of $2–$10 million, the market is rarely good enough to permit switches." [34] Hence, after deducting transaction costs, the gain from arbitrage might be too small to warrant the effort.

Buyers, it has been noted, may purchase seasoned bonds at yields below those available on new issues because of a preference for specific issues. At the same time, many quotations on seasoned issues may be nominal in the sense that no transactions actually occur at the quoted rates. Indeed, particularly for inactive securities, yields on dealer quotation sheets may not be revised rapidly enough to reflect the

[32] Sidney Homer, Letter to Mark W. Frankena, November 8, 1967.

[33] Homer, July 20, 1965 Letter.

[34] "A Dynamic Approach to Institutional Bond Investment," p. 16.

yields at which transactions would actually take place if they were made. It might be that quotations based on actual transactions in sizable amounts would not show such large spreads. Homer states:

Recent issues, if sizable, enjoy a very active market from the moment the syndicate price restrictions are removed; the turnover is sometimes enormous, especially if there is a market decline. Many temporary holders get in and out; markets are usually quoted at $\frac{1}{8}$ point spreads and are good for many million bonds either way. Furthermore, many dealers in the Street participate in these large recent issues and many speculators buy them for small near-term gains. During the first two or three hours after the syndicate price restrictions are removed, a large part of the total trading has usually been done. Thereafter, the volume will taper off sharply; but for a period up to, say, three months it will continue far larger than for seasoned issues. Around that point trading activity will die out, and the issue will take its place as just one more seasoned utility. Most Street traders will forget, most speculators will be out, and only a few people will remember that it exists. It follows that true dealer markets for recent substantial issues are much more active, and the quotes are much more sensitive and narrow, than for seasoned issues. Quotes on seasoned issues tend to lag quotes on recent issues, where all the business is being done. In other words, the traders will always be changing around the quotes on active issues, while they will sometimes delay for a few days changing their largely theoretical quotes on seasoned issues. I say "theoretical" only because they are not doing very much business in them and are estimating their quotes, in the absence of real buyers, from the yield book just so the yield will line up with that of other similar issues. Therefore, the quotes on the great mass of seasoned issues are in their nature very different from the quotes on recent issues and revisions for seasoned issues are made more rarely.[35]

Richard West has concluded that in the case of state and local government bonds quite a different type of market imperfection—namely, monopsony in the underwriting and distribution of securities—

[35] Homer, July 20, 1965 Letter. This conclusion should be compared with that of White who writes that "the available evidence shows an adequately large volume of transactions in seasoned bonds by professional investors (such as pension funds and the smaller life insurance companies for whom the market's size is adequate) so that the prices of many of the larger issues of seasoned bonds can be assumed to reflect fully the conditions on the broader, new issue market. And accurate, reliable prices of seasoned bonds could emerge even if only a very minor fraction of the outstanding amount were sold during a given year. This is made plausible (although not a certainty) by the homogeneity of the various bond issues and of investors' interest in them; these homogeneities should make most holders unwilling to make transactions at the market's equilibrium price but to make very large transactions at prices that diverge appreciably from that equilibrium." William H. White, pp. 136–137.

is responsible for part of the spread between new and seasoned yields. He argues that when only one underwriting bid is made for an issue the underwriting syndicate can buy a bond at a price below the competitive level. However, to maintain its monopsony status, the bidding syndicate must share its extra-normal returns with firms which would otherwise submit competing bids. This sharing is done by reoffering the bonds at prices below the competitive level and rationing their sale to those with whom the profits are to be shared. Thus, when there is only one underwriting bid, the yield spread between new issues and comparable seasoned bonds is relatively large. West found, however, that the influence of the number of bids on the yield spread in the state and local government bond market was limited to offerings that received only one or two bids.[36] Since the number of bids received for corporate bonds is normally between two and nine, it is unlikely that this type of market imperfection explains any of the corporate yield spread. In addition, West found a virtual disappearance of yield spreads for single bid issues only two days after reoffering, making it clear that the spreads are of a different sort from those on corporate bonds, which persist for two and three months.

FURTHER IMPLICATIONS OF THE HYPOTHESES. The different hypotheses advanced to explain the new-seasoned yield spread have quite different implications for the relationship between the new and seasoned issue markets. The hypothesis based on market imperfections implies that the forces determining interest rates operate most directly and immediately on new issue yields. The hypothesis which attempts to explain the spread in terms of the pricing policy of underwriters, in contrast, does not imply that either the market for new issues or that for seasoned issues is more sensitive to changes in market conditions (although it does suggest that new issue yields will be more volatile).[37] It implies only that underwriters' expectations about future

[36] West found that on the average a single bid raised the yield spread by 13 basis points and two bids raised it by 2 basis points, as compared to issues with more than two bids. West, p. 141.

[37] The fact that the new issue series is more erratic than the seasoned issue series may be due to three things: (1) the number of issues in the new issue series is often considerably smaller than the number in the seasoned series; (2) the large role of expectational forces in determining new issue yields due to the pricing policy of the underwriters; and (3) the possibility that market forces act more directly on new issue yields, with the seasoned issue series following a distributed lag adjustment to its equilibrium level.

conditions in these markets generally cause them to be more or less concerned about assuring a rapid distribution of their inventories of new issues.

The hypotheses we have presented are nevertheless complementary rather than contradictory explanations. Even if we accept the hypothesis concerning the pricing policies of underwriters, this hypothesis cannot explain a spread which persists for a number of weeks after the termination of the syndicate. In order to explain the persistence of the spread even on issues which are similar with respect to all yield-determining characteristics, we must allow for market frictions or imperfections.

IV. Statistical Tests

VARIABLES FOR MULTIPLE REGRESSION. Multiple regression analysis is the major analytical technique used in this part of the study. The technique involves the regression of a dependent variable, which in this section will always be the new-seasoned yield spread, on independent variables which the hypotheses suggest may explain the variations in the size of the dependent variable.[38] These variables are: (1) difference in coupon rate between new and outstanding issues; (2) changes in the level of yields; (3) volume of new issues; (4) level

TABLE 5-3. Independent Variables Suggested by Each of the Major Hypotheses

Independent Variable	Coupon Difference	Underwriting Risks	Market Imperfections
Coupon difference	+		
Change in the level of yields	−	+	+
Volume of new issues	+	+	
Level of long-term yields	−	+, −	
Ratio of slow-selling to total new issues		+	
Level of Treasury bill yields		+	

[38] We have important reservations about some of the regressions run, but the results will be presented before discussing any problems of interpretation.

of long-term yields; (5) ratio of slow-selling to total new issues; and (6) level of Treasury bill yields.

Table 5-3 summarizes how each of various independent variables would be expected to influence the new-seasoned yield spread under each of the three major hypotheses regarding the cause of the yield spread. The direction of the influence is given by a plus or minus sign.

Because of intercorrelation among four of the independent variables (coupon difference, volume of new issues, level of yields, and bill rate), it was not advisable to include all of these variables in a single regression equation. For example, the level of yields and bill rates are both correlated with coupon differences. When either is added to a regression that already includes coupon difference, it takes a large negative coefficient and increases the coefficient of the coupon difference. In regressions run with data corrected for coupon, the yield level and bill rate do not show negative coefficients.[39] Similar problems pertain to the variable measuring the volume of new issues. Because of these statistical problems, the first set of regressions which will be presented include only the coupon difference and lagged yield changes as independent variables.

FINDINGS FROM FULL PERIOD REGRESSIONS. We begin with four regressions, one for each of the four monthly new issue series. All the regressions apply to the full period from 1952 through 1963, though the number of monthly observations varies as some of the series did not include observations of the new issue yield for every month. Table 5-4 summarizes the regression coefficients and their t-values when all variables are included in the regression, along with the F statistic for the addition of each variable to the preceding ones in the regression, and correlation coefficients.[40] The variable X_{10} stands for M_{10} in the case of the Moody regression, B_{10} in the Bankers Trust regression, K_{10} in the Kaplan regression, and H_{10} in the Homer regression. The same pattern follows for X_{30} through X_{41}. The subscript 1 denotes the

[39] The negative partial correlation of the level of yields and the yield spread in the regression with data uncorrected for coupon could be explained in part by the fact that the yield spread (due to any given difference in coupon rate) is lower when the level of yields is high. However, because of a high degree of multicollinearity between the difference in coupon rates and the level of interest rates, it seems probable that the correlation is essentially spurious. In any event, the regressions with data corrected for coupon are theoretically more satisfactory, and chief reliance is placed on them.

[40] An explanation of the statistical methodology used in this study is provided in any standard textbook of econometrics.

TABLE 5-4. Summary of Regressions for New-Seasoned Yield Spreads (X_1) Not Corrected for Coupon Differences (*by yield series*)

Independent Variable	Moody: M_1			Bankers Trust: B_1			Kaplan: K_1			Homer: H_1		
	b	*t*	*F*	*b*	*t*	*F*	*b*	*t*	*F*	*b*	*t*	*F*
X_{10} (coupon rate difference)	.284	11.34	243.38	.246	10.62	209.29	.287	15.17	232.94	.160	9.76	116.61
X_{30} (change in yields)	.492	8.94	45.95	.437	6.73	34.02	.384	4.35	24.59	.311	4.14	13.12
X_{31}	.265	4.62	8.79	.216	3.19	6.81	.084	0.91	1.44	.177	2.30	4.28
X_{32}	.167	2.93	3.02	.123	1.79	2.60	.055	0.60	0.95	.143	1.86	3.66
X_{33}	.147	2.61	2.32	.113	1.70	1.71	.121	1.38	1.89	.158	2.11	1.59
X_{34}	.145	2.69	2.99	.063	0.96	0.37	Not included			.084	1.13	0.65
X_{35}	.123	2.28	2.19	.072	1.02	0.35	"			.135	1.83	3.28
X_{36}	.127	2.36	2.77	.114	1.68	3.68	"			.157	2.14	4.93
X_{37}	.144	2.69	4.75	.151	2.27	4.48	"			.138	1.88	3.60
X_{38}	.107	1.98	2.02	.108	1.51	1.90	"			.105	1.41	1.56
X_{39}	.091	1.67	1.62	.114	1.72	3.03	"			.142	1.88	3.99
X_{40}	.093	1.74	2.34	.082	1.22	1.76	"			.112	1.48	4.04
X_{41}	.096	1.79	3.19	.080	1.22	1.48	"			.156	2.13	4.54
Constant	−.047			.017			−.060			.027		
Number of observations			121			127			144			144
Mean of yield spread			.175			.231			.129			.251
S.D. of yield spread			.235			.204			.175			.190
Simple correlation coefficient of yield spread and X_{10}			.820			.791			.788			.672
S.E. of estimate			.104			.104			.100			.124
Multiple correlation coefficient			.910			.876			.829			.784
F statistic of multiple correlation coefficient			39.40			28.74			60.65			15.94

new-seasoned spread without correction for coupon, the subscript 10 denotes the coupon difference variable, and subscripts 30 through 41 denote changes in new issue yields. A full explanation of the symbols is provided in the Appendix.

Coupon Difference. Because of its importance in explaining yield spreads, the difference in coupon rate must enter the regression equation when the series used to calculate those spreads do not have the same coupon rate at each observation. The variable used here is the difference between the average coupon on the bonds in the two series, new issue minus seasoned. The hypothesis concerning the effect of coupon rates discussed above suggests a positive correlation between yield spread and coupon difference.

The hypothesis is borne out by the four regressions shown in Table 5-4, all of which show a very high simple correlation coefficient (.67 to .82) and high *t*-values for the *b*-coefficient in the multiple regression. Part of the statistical influence of the coupon rate is no doubt due to its correlation with other variables not included in the regression equation. The regression coefficient of the coupon difference is large in absolute terms, ranging from .25 to .29 in the first three regressions. This implies that a 10 basis point difference in coupon produces a 2 to 3 basis point difference in spread. The coefficient is somewhat smaller in the Homer regression because the coupon rate was substantially lower for the seasoned Homer series than for the seasoned series used in the other regressions; and the influence of a given amount of coupon difference is relatively small at low coupon levels.[41]

For a number of reasons, use of a coupon difference variable in a linear regression equation is a very imperfect way of accounting for the effect of the coupon rate. The coupon rate and other variables we wished to include in the regression are intercorrelated. The influence of coupon differences on yield spread is not linear, and the effect apparently changed over the period studied.[42] Moreover, there may be a reverse influence of yield spread on coupon difference, stemming from the practice of setting the coupon rate on new issues so that the issues will sell close to par.[43]

To deal with these problems, series of seasoned bond yields were constructed for use with the Moody and Homer new issue series which

[41] Frankena study.

[42] Frankena found a marked downward trend in the size of yield spreads due to coupon differences during the period.

[43] Because of this practice, the new issue coupon rate is an endogenous variable, and it follows that the difference in coupon rates is an endogenous variable.

carried the same coupon rate as the new issues in each month. In this way, the influence of coupon differences is eliminated from the new-seasoned spread, making the data more satisfactory for testing other explanations of the spread.

The extent to which the spread between new and seasoned issues is reduced by eliminating the effect of coupon differences is striking. Charts 5-1 and 5-2 show graphically the effect of this correction for the Moody and Homer series. The average new-seasoned spread for the period from 1952 through 1963 was 16.7 basis points for the basic Moody Aa corporate series when no adjustment was made for coupon differences. When the spread was measured as the difference between the new issue yield and the yield on seasoned bonds with the same coupon rate as the new issues, it averaged only 9.2 basis points. Similarly, for the Homer series, the average spread was 25.1 basis points using uncorrected series, but only 9.0 basis points when measured from the yield on seasoned bonds with coupon rates equal to those on new issues. Thus, equalization of the coupon rate eliminates more than two-fifths of the spread in the Moody series and more than three-fifths of the spread in the Homer series. The larger correction in the case of the Homer series is due to the lower coupon rate in the Homer seasoned series.

Changes in the Level of Yields. Both the hypothesis concerning underwriters' pricing policies and that concerning market imperfections suggest a positive correlation between past changes in the level of yields and the size of the new-seasoned yield spread.[44] If underwriters expect yields to continue rising, or if the seasoned market lags behind the market for new issues, the spread will increase when new issue yields rise.

The change-in-yield variables [45] were tested in the four initial regres-

[44] In the case of the regressions for the yield spread measured without correction for differences in coupon rate, there is another reason for a correlation (negative) of the spread with the change-in-yield variables: A given coupon difference will have somewhat less influence on yield spreads when yields are rising. Frankena found that yield spreads between bonds with different coupon rates were smaller in periods of rising yields. It was hypothesized that this occurred because the greater call protection and capital gains potential of lower coupon bonds were given a lower market value when bond prices were falling.

[45] These are defined in the Appendix. Variables X_{30} through X_{41} used in Tables 5-4 and 5-5 are one-month changes in new issue yields with lags of from one to twelve months preceding the observation to be explained. It may be noted that if only the market imperfections were involved, the model employed in this paper would be less plausible than a distributed lag model which assumed that the level of yields on seasoned issues would adjust to its equilibrium level according to a distributed lag process. For

TABLE 5-5. Summary of Regressions for New-Seasoned Yield Spreads Corrected for Coupon Differences

Independent Variable (changes in yield)	Moody: M_2			Homer: H_2		
	b	*t*	*F*	*b*	*t*	*F*
X_{30}	.524	11.81	56.42	.244	8.81	51.72
X_{31}	.287	6.18	11.09	.143	5.04	20.84
X_{32}	.228	4.92	7.43	.093	3.27	10.60
X_{33}	.220	4.77	8.52	.094	3.39	6.03
X_{34}	.224	5.02	12.38	.060	2.20	3.31
X_{35}	.184	4.14	9.16	.071	2.61	8.21
X_{36}	.160	3.57	6.49	.110	4.03	16.58
X_{37}	.178	3.98	8.57	.072	2.65	6.94
X_{38}	.197	4.43	11.97	.043	1.56	2.94
X_{39}	.140	3.09	6.17	.064	2.30	6.41
X_{40}	.120	2.68	5.37	.034	1.21	2.33
X_{41}	.143	3.17	10.07	.032	1.17	1.36
Constant	.070			.081		
Number of observations		121			144	
Mean of yield spread		.097			.090	
S.D. of yield spread		.154			.069	
S.E. of estimate		.089			.046	
Multiple correlation coefficient		.838			.772	
F statistic of multiple correlation coefficient		18.25			16.14	

NOTE: See Appendix for definition of symbols.

sions run for spreads not corrected for coupon differences and in the two regressions covering bonds with the same coupon rate (Table 5-5). In each of the six regressions, all twelve change-in-yield variables covering the year preceding the month of observation have positive regression coefficients.[46] Not all of the regression coefficients were

example, the one-month change in seasoned yields might equal a certain fraction of the difference between the equilibrium level of seasoned yields at the end of the month and actual levels of seasoned yields at the beginning of the month. This model would have different implications for yield spreads than would the model tested here, particularly at turning points.

[46] Only four change-in-yield variables were used in the Kaplan series, but when the variables for the change in Moody new issue yields (M_{30}–M_{41}) were used as independent variables with the Kaplan spread, all twelve had positive regression coefficients.

statistically significant individually, but the uniformly positive signs make them collectively more significant than is indicated by their individual t-values and F statistics.[47] A weighted average of changes in yields over the past year therefore appears to be a very significant variable. The weights show a clear tendency to decline as the lag becomes longer, particularly in the case of the Moody series. This is to be expected whether the change-in-yields variables are important because of their influence on underwriters' expectations or because of a lag in the adjustment of seasoned rates.

The twelve change-in-yield variables explain 70 per cent and 60 per cent, respectively, of the total variance in the Moody and Homer regressions for spreads corrected for coupon differences. In the equations for spreads uncorrected for coupon difference the change-in-yield variables increase the explained variance by a smaller percentage but a statistically significant amount.

This finding, however, is consistent with either hypothesis, the one concerning underwriting risks or that concerning imperfections in the capital market, or with both. (We will return later to the problem of differentiating between these hypotheses.) Part of the correlation of the change-in-yield variables with yield spread, furthermore, may be spurious. The observation for the level of new issue yields can be viewed as a random variable, the mean of a sample drawn from a theoretical population of new issue yields. Any random influence on the sample mean for the new issue yields, causing it to deviate from the population value, will result in a corresponding change in the recorded new-seasoned spread.[48] This would cause an upward bias in the coefficient of the change-in-yield variable for the month immediately prior to the observation (i.e., X_{30}) and also in the correlation coefficient. It would bias the other regression coefficients only if there is positive autocorrelation of the error terms in the regression equation. Unfortunately, there seems to be autocorrelation in our equations;[49] hence the possibility of bias extends to the change-in-yield variables of earlier periods as well.[50]

[47] The probability of a t-value greater than 1.64 would be .10, greater than 1.96 would be .05, and greater than 2.58 would be .01 if there were in fact no relation between the independent and dependent variables.

[48] An error of measurement or factors omitted from the regression which influence the new issue but not the seasoned market would lead to the same problem.

[49] The problem of autocorrelation will be discussed below.

[50] As a partial check on the severity of this problem, we tried a new specification, computing the change-in-yield variables from the yield on long-term governments rather than from the yield on corporate new issues. This reduces the spurious correlation between the yield spread and the change in yield in the preceding month. In applying this

Volume of New Issues. It was hypothesized above that the volume of new issues competing for investment funds might affect underwriting risk and, thereby, the size of the new-seasoned yield spread. This hypothesis received only moderate statistical support. Some measures of new issue volume were statistically significant when included in regressions along with the change-in-yield variables, but the levels of significance were not high enough, nor were the results consistent enough, to lend any certainty to the hypothesis.[51]

Among the different measures of volume tested in the study were (a) Aa corporate bonds, (b) Aaa through Baa corporate bonds, (c) all corporate bonds including both public offerings and private placements, (d) all corporate securities including both bonds and equities, (e) all corporate securities plus home mortgages, (f) all corporate plus two-thirds of state and local bonds,[52] (g) all corporates plus newly issued government bonds with maturities of fifteen years or more, and (h) all of these bonds. Simple and multiple regressions suggested that either all corporate bonds or all corporate securities including both bonds and equities were the best measures, although the results were not entirely consistent.[53]

In general, the best correlations were obtained using the volume for the month of the observation of yield spread plus the two months preceding. However, the best length of period varied from two to five months for different volume measures.

It seemed possible that the volume of new issues anticipated in the

procedure we employed a distributed lag technique developed by Shirley Almon after our other regressions were estimated (Shirley Almon, "The Distributed Lag Between Capital Appropriations and Expenditures," *Econometrica,* January 1965, pp. 178–181). This procedure generated a smoothly declining set of weights for the change-in-yield variables, and moderate reduction in the variance explained by these variables (from 70 and 60 per cent to 40 and 49 per cent in the Moody and Homer series, respectively). This change in procedure does not eliminate the possibility of bias, however, because changes in yields on governments in the month preceding the month of observation are correlated with changes in new issue yields, and may therefore be spuriously correlated with the yield spread.

[51] One problem caused by using new issue volume as an independent variable is that the volume is really endogenously determined. For this reason, the use of volume involves problems of simultaneous equations bias.

In his study of new-seasoned yield spreads for state and local government general obligation bonds, Richard West found that the regression coefficients for various measures of market volume (current or expected) and for dealer's inventories were not significantly different from zero.

[52] Two-thirds of the state and local issues were included on the basis that this might represent the long-term portion of the total.

[53] Deduction of new issues intended for refunding made no apparent improvement in the volume measures.

month following the observation for yield spread might also be relevant. Measures for the securities registered for issue in the succeeding month, for securities registered for issue in any future period including the next month, and for securities actually issued in the succeeding month, however, did not prove significant in any of the multiple regressions.

Tables 5-6 and 5-7 show the results of two regressions that generated relatively high *t*-values for volume as an independent variable.

TABLE 5-6. Summary of Regression for Moody New-Seasoned Yield Spreads Corrected for Coupon and Including Volume as an Independent Variable

Independent Variable	*b*	*t*	*F*
X_{30} (change in yield)	.515	12.08	56.88
X_{31}	.260	5.91	11.20
$X_{32} + X_{33}$	.222	6.69	16.66
$X_{34} + X_{35}$	.220	6.72	22.37
$X_{36} + X_{37}$	.163	5.05	16.05
$X_{38} + X_{39}$	.163	4.97	18.57
$X_{40} + X_{41}$	.134	4.25	16.09
V_{61} (volume)	.038	2.61	6.79
Constant	−.034		
Number of observations		122	
Mean of yield spread		.097	
S.D. of yield spread		.153	
S.E. of estimate		.085	
Multiple correlation coefficient		.845	
F statistic of multiple correlation coefficient		35.40	

NOTE: See Appendix for definition of symbols.

The equations used are for the Moody series with the same coupon rate for new and seasoned issues; change-in-yield variables are included in addition to volume.[54] The volume measure in Table 5-6 (V_{61}) covers new issues of corporate bonds and equities for the current and two preceding months, while volume in Table 5-7 (V_{62}) covers the same securities but includes three, rather than two, months

[54] In Table 5-6 the change-in-yield variables after the first one are each for two-month yield changes. This format was used at an earlier stage in the study, and does not significantly affect the regression.

TABLE 5-7. Summary of Regression for Moody New-Seasoned Yield Spread Corrected For Coupon and Including Level of Yields on Seasoned Bonds and Volume of New Issues as Independent Variables

Independent Variables	*b*	*t*
X_{30} (change in yield)	.518	11.77
X_{31}	.273	5.86
X_{32}	.223	4.86
X_{33}	.220	4.83
X_{34}	.231	5.22
X_{35}	.204	4.54
X_{36}	.169	3.81
X_{37}	.171	3.86
X_{38}	.193	4.39
X_{39}	.138	3.06
X_{40}	.115	2.60
X_{41}	.148	3.32
X_{21} (yield level)	−.015	−1.04
V_{62} (volume)	.028	2.10
Number of observations	121	
Mean of yield spread	.097	
S.D. of yield spread	.154	
S.E. of estimate	.088	
Multiple correlation coefficient	.846	
F statistic for over-all regression	19.01	

NOTE: See Appendix for definition of symbols.

prior to the current month. The *t*-value for volume is not quite as high when the level of yields is included in the regression, as in Table 5-7, but it is still significant at the .05 level. This overstates the true confidence level because a large number of volume measures were tried in order to find one with a *t*-value as high as this.[55]

In the Homer equation, the *t*-value for the best volume measure is 1.97 (Table 5-8).[56] However, addition of the level of seasoned yields

[55] This is true of all *t*-values for the volume variables.

[56] The volume measure in the Homer regressions, V_{52}, covers new corporate bonds only, for the three months preceding the observation of the yield spread. Since the Homer yield spreads apply to the first of the month while the Moody spreads are monthly averages, the time periods of the volume variables in the Moody and Homer regressions are approximately the same.

as an independent variable reduces it to .95, which is not statistically significant.[57]

Level of Yields. Charts 5-1 and 5-2 suggest that the yield spread is greatest when yields are high. For the most part, this is probably due to the correlation of yield levels with other factors affecting the spread, particularly with differences in coupon rates, which are larger when yield levels are higher.[58] Such an influence can be avoided by testing yield levels in the equations covering new and seasoned bonds with the same coupon rate.

The underwriting risk hypothesis indicates two reasons why the level of yields may be relevant. First, when yields are high the yield spread between long-term and short-term securities is small, or negative, making it more expensive to carry new issues (if holding periods yields are directly related to yields to maturity). Second, underwriters may fear that yields, which have climbed to high levels, may continue to rise.[59] Yet, the opposite reaction is often viewed as more plausible: When rates are high, dealers and investors may expect them to fall back toward "normal." The direction of influence is therefore not clear.

When the level of yields on seasoned bonds (unadjusted for coupon) is added to the Moody regression (adjusted for coupon) its coefficient is not significant (Table 5-7). In the Homer regression for spreads corrected for coupon, however, the level of yields on seasoned bonds with a coupon rate of $2\frac{3}{4}$ to $2\frac{7}{8}$ per cent is statistically significant at the .01 level in the multiple regression including the change-in-yield variables, whether or not volume is also included as an independent variable (Table 5-8). In the regression without a volume variable, the regression coefficient for the level of seasoned yields has a t-value of 3.57, and the F statistic for addition of the level of seasoned yields to the regression is 12.75. The addition of the level of yields increases the coefficient of multiple correlation from .772 to .795. The reason for the different results in the Moody and Homer regressions is not clear.

[57] The simple correlation coefficient of volume (V_{65}) and the level of yields (H_{21}) is .291.

[58] Partly offsetting this is the fact that the yield spread between bonds with the same coupon rates will be smaller the higher the general level of yields. The reason is that at a higher level of yields the risk of call and limited capital gains of the higher coupon bond appears smaller and hence the bond has a smaller risk premium. This relationship implies that the level of yields has a negative influence where coupon rates are held constant.

[59] William H. White study, p. 125.

TABLE 5-8. Summary of Regressions for Homer New-Seasoned Yield Spread Corrected for Coupon and Including Level of Yields on Seasoned Bonds With a Coupon Rate of $2\frac{3}{4}$–$2\frac{7}{8}$ Per Cent and Volume of New Issues as Independent Variables

Independent Variable	*b*	*t*	*b*	*t*	*b*	*t*
X_{30} (change in yields)	.243	9.12	.249	9.05	.246	9.17
X_{31}	.136	4.98	.140	4.98	.136	4.98
X_{32}	.087	3.21	.086	3.03	.086	3.16
X_{33}	.090	3.40	.093	3.38	.091	3.40
X_{34}	.053	2.01	.065	2.38	.053	2.02
X_{35}	.065	2.47	.080	2.92	.068	2.58
X_{36}	.105	4.04	.118	4.33	.111	4.15
X_{37}	.068	2.60	.078	2.89	.072	2.72
X_{38}	.040	1.53	.046	1.67	.043	1.63
X_{39}	.062	2.30	.064	2.33	.063	2.34
X_{40}	.034	1.26	.034	1.22	.034	1.28
X_{41}	.031	1.18	.034	1.27	.031	1.19
X_{21} (yield level)	.024	3.57			.021	2.97
V_{65} (volume)			.018	1.97	.0072	.95
Constant	−.007		.044		−.018	
Number of observations		144		144		144
Mean of yield spread		.090		.090		.090
S.D. of yield spread		.069		.069		.069
S.E. of estimates		.044		.046		.044
Multiple correlation coefficient		.795		.780		.797
F statistic of over-all regression		15.98		14.41		16.03

NOTE: See Appendix for definition of symbols.

Tightness in the Money Market. It was hypothesized that a tight money market could increase the cost and difficulty of underwriting new issues and, hence, contribute to a new-seasoned yield spread. To measure tightness in the money market, tests were performed using the level of free reserves, the yield spread between long-term and short-term issues, and the yield on newly issued three-month Treasury bills. On the basis of simple correlation coefficients, the bill rate was chosen as the best measure. However, in the multiple regressions covering the Moody and Homer series corrected for coupon differences, the regression coefficient for the bill rate was not significantly

different from zero at even the .10 per cent level in either series, although it was positive in both.[60]

Ratio of Slow-Selling to Total New Issues. It was hypothesized that when new issues had been selling slowly in the recent past, underwriters would bid low enough for new issues to permit their distribution at prices below those on comparable seasoned issues. This would suggest that the new-seasoned yield spread would be positively correlated with the proportion of new issues which had moved slowly in the recent past. A new issue was defined as slow-selling if it was still in syndicate on the Monday following the date of issue. The ratio of such issues to total new issues of A, Aa and Aaa public utilities was calculated for the month preceding the observation of yield spreads, and separately for the month before that one. However, using either the Moody or Homer series corrected for coupon, the coefficients for the ratio of slow-selling to total new issues in each of the two preceding months were not statistically significant, even at the .10 level, in multiple regressions including the volume of new issues during the previous three months, the level of yields, and four variables measuring the change of yields during the previous twelve months.

Summary of Findings from Full Period Regressions. On the basis of the regressions run for the full period from 1952 through 1963, we can draw the following conclusions concerning the three major hypotheses which were being tested:

(1) Coupon differences between the bonds in the new issue and seasoned series explain a large part of the average level and the variance of the new-seasoned yield spread as it is usually recorded. Differences between the average coupon rates on the bonds used in the new issue and seasoned issue series accounted for an average of 41 and 62 per cent of the spread and for 57 and 87 per cent of the variance of the spread for the Moody and Homer series, respectively.

(2) A weighted average of changes in new issue yields over the preceding year has been found to be very important as an explanatory

[60] In a previously published summary of this study, the bill rate was included in the regression covering the Homer series corrected for coupon because its regression coefficient had a *t*-value of 2.69. However, subsequent changes in the other variables in the regression and extension of the time period covered by the regression sharply reduced the coefficient.

Using regression equations which included four rather than twelve separate variables to measure the change in new yields over the preceding twelve months and which included the volume of new corporate securities including equities issued in the current month and in the preceding one, the regression coefficient of the bill rate had *t*-values of .43 and 1.31, respectively, in the Moody and Homer regressions.

variable in the regressions for yield spread—accounting for between 60 and 70 per cent of the variance of the spread remaining after correction for coupon. This was suggested by the consistently positive and generally significant regression coefficients of the twelve lagged change-in-yield variables used in the regressions, both with and without correction for coupon. The results give strong support to either or both of two hypotheses. In the first, new-seasoned spreads increase when new issue yields have been rising, because underwriters are led to believe that the yields will continue to rise in the near future. Consequently, underwriters reduce their bids and offering prices on new issues to assure rapid distribution, which further causes new issue yields to exceed the yields on comparable seasoned issues. The second hypothesis is that new-seasoned spreads increase following a rise in new issue yields because yields on seasoned issues lag behind those on new issues. Thus, when new issue yields rise, the spread widens.

However, the multiple regressions give no basis for deciding between these two hypotheses, and there remains the problem of spurious correlation. As has already been seen, both hypotheses are supported by institutional considerations. Additional tests will follow shortly which were made in an attempt to discover the importance of each hypothesis.

(3) Moderate statistical support was found for including a variable measuring the volume of new issues of corporate bonds or of corporate bonds and equities for the month of observation of the yield spread plus the two preceding it. The interpretation placed on this was that when the market becomes congested with new issues competing for investment funds, underwriters foresee greater difficulty in distributing them and, accordingly, reduce their bids and offering prices for new issues. Thus the yields on new issues are increased above those on comparable seasoned issues. However, the levels of the significance and consistency of the results were not great enough to lend any certainty to the hypothesis.

(4) The level of seasoned yields had no explanatory power in the Moody regression of spread corrected for coupon, but it was statistically significant with a positive regression coefficient in the coupon-corrected Homer regression.

(5) No statistical support was found for the hypothesis that underwriters' pricing policies might be affected by the speed of sale of recent issues, as measured by the ratio of slow-selling to total new issues in the recent past.

(6) No statistical support was found for the hypothesis that money

market conditions, as measured by the Treasury bill rate, affect the new-seasoned spread.

ANALYSIS OF SUBPERIODS. During the earlier stages of this study, regressions similar to those covering the full period, January 1952–December 1963, were run separately for periods of rising yields and periods of falling yields using the Moody data. Similarly, separate regressions were run for each of three complete specific cycles in interest rates.[61] These subperiod regressions are presented in Tables 5-9 and 5-10. The yield variables M_{30}, M_{56}, M_{57}, and M_{58} are somewhat different from those used before, but not importantly. Exact definitions are given in the Appendix. On the whole, the same variables that explain the variation in yield spreads in the full period seem to explain most of the variation in each of the subperiods as well. The following are the main points suggested by the subperiod regressions.

(1) The volume measure showed an inconsistent pattern in the subperiod runs, as it had in variously specified equations covering the whole period. In coupon-corrected equations that included the bill rate, volume was significant at the .01 level in the first two interest rate cycles, as it was during periods of rising yields, but it was not in the third interest rate cycle or in periods of falling yields. (In the regression uncorrected for coupon, volume was not significant in runs that included the bill rate in either subperiod or full-period regressions.)

(2) In regressions that do not include bill yields, the coefficients of the change-in-yield variables were of the same general order of magnitude during periods of rising yields and those of falling yields, and during the individual interest rate cycles, as they were during the entire period. In coupon-corrected regressions that included bill yields, however, the coefficients of the change-in-yield variables were considerably smaller for the separate interest rate cycles than for the period as a whole. This was most notably the case for the more remote change-in-yield variables.

(3) In each of the three interest rate cycles, but not in the regressions for periods of rising and falling yields, the Treasury bill rate

[61] The periods of rising rates were January 1952 through May 1953, April 1954 through October 1957, July 1958 through September 1959, and January through December 1963. The periods of falling rates were September 1953 through March 1954, November 1957 through June 1958, and October 1959 through January 1963. The first interest rate cycle was January 1952 through March 1954, the second was March 1954 through June 1958, and the third was June 1958 through January 1963.

proved to be statistically significant at the .05 level; and in the case of the second and third cycles it was statistically significant at the .01 level (Table 5-10). As noted above, when the bill rate was added to the regressions for the first and second cycles, though not the third one, it considerably reduced the significance of some of the change-in-yield variables, since the correlation of the bill rate and the change-in-yield variables is considerably higher in the individual interest rate cycles than in the whole period. Since very strong support has already been found for the change-in-yield variables, it might be that the bill rate is acting as a proxy for those variables and is statistically significant for that reason.

TABLE 5-9. Summary of Full Period and Subperiod Regressions for Moody New-Seasoned Spreads With and Without Corrections for Coupon Differences

	Full Period		Period of Rising Rates		Period of Falling Rates	
Equation	(1) M_1	(2) M_2	(3) M_1	(4) M_2	(5) M_1	(6) M_2
			Part A			
b_1 for M_{10} (coupon differences)	.279	–	.292	–	.378	–
b_2 for M_{30} (change in yields)	.485	.510	.474	.645	.328	.446
b_3 for M_{56}	.250	.239	.235	.313	.083	.145
b_4 for M_{57}	.136	.224	.136	.255	−.040	.250
b_5 for M_{58}	.157	.210	.096	.144	.131	.257
b_6 for V_{60} (volume)	−.016	.043	.004	.056	−.056	.049
Constant	−.010	−.005	−.003	−.037	−.067	−.020
t for b_1	11.934	–	9.696	–	9.034	–
t for b_2	9.428	12.257	6.501	11.950	4.346	6.497
t for b_3	5.035	5.892	3.463	5.991	1.056	1.963
t for b_4	3.113	6.343	2.132	5.497	−.553	3.830
t for b_5	4.362	7.542	2.527	4.590	2.321	5.082
t for b_6	−.707	2.238	.136	2.176	−1.664	1.536
Number of observations	128	128	77	77	57	57
Mean of yield spread	.172	.096	.222	.143	.114	.042
S.D. of yield spread	.230	.150	.238	.149	.229	.160
S.E. of estimate	.100	.085	.082	.075	.103	.103
Multiple correlation coefficient	.906	.831	.943	.874	.906	.787
F statistic of multiple correlation coefficient	92.02	54.25	94.08	45.81	37.96	16.57

(continued)

TABLE 5-9 (concluded)

Equation	Interest Rate Cycle #1 (1) M_1	(2) M_2	Interest Rate Cycle #2 (3) M_1	(4) M_2	Interest Rate Cycle #3 (5) M_1	(6) M_2
			Part B			
b_1 for M_{10} (coupon differences)	−.151	–	.314	–	.459	–
b_2 for M_{30} (change in yield)	.795	.357	.426	.464	.375	.639
b_3 for M_{56}	.555	.125	.163	.118	.178	.352
b_4 for M_{57}	.374	.186	.069	.164	.086	.329
b_5 for M_{58}	.327	.027	.102	.160	−.018	.191
b_6 for V_{60} (volume)	.001	.064	.023	.159	−.012	−.003
Constant	.175	−.021	−.020	−.182	−.247	.062
t for b_1	−1.094	–	17.065	–	15.287	–
t for b_2	6.048	6.948	12.456	7.948	6.948	9.997
t for b_3	4.909	2.163	5.376	2.205	3.493	5.601
t for b_4	4.677	3.493	2.376	3.376	1.925	5.762
t for b_5	3.427	.515	3.461	3.447	−.595	5.246
t for b_6	.043	2.302	.948	4.087	−.542	−.088
Number of observations	21	21	44	44	54	54
Mean of yield spread	.131	.070	.256	.148	.154	.069
S.D. of yield spread	.161	.096	.250	.159	.227	.164
S.E. of yield estimate	.034	.040	.043	.077	.060	.084
Multiple correlation coefficient	.985	.933	.987	.890	.968	.874
F statistic of multiple correlation coefficient	74.107	20.157	235.602	28.879	118.221	31.094

NOTE: See Appendix for definition of symbols.

AUTOCORRELATED ERRORS. A statistical problem encountered in the regressions used in the study is autocorrelation of the residual error terms. Although Durbin-Watson statistics were not computed for the residuals of the regressions run in the main part of this study, some checks showed that the Durbin-Watson statistics were typically between 1.2 and 1.6. This indicates a highly significant, positive first-order autocorrelation of the residuals.

Autocorrelation of errors does not introduce a bias into the least-squares estimates of the true parameters as long as the model is not autoregressive. However, even in the nonautoregressive case the statistical significance of the regression coefficients, as measured by their t-values, is overstated because of the underestimation of the standard errors of the regression coefficients computed by ordinary least-squares. Moreover, if the regression equation with autocorrelated

TABLE 5-10. Summary of Regressions by Interest Rate Cycle for Moody New-Seasoned Yield Spread Corrected for Coupon, Including Treasury Bill Rate as an Independent Variable

	Interest Rate Cycle			
	#1	#2	#3	Entire Period
b_1 for M_{30} (change in yields)	.259	.433	.628	.509
b_2 for M_{56}	.035	.066	.314	.235
b_3 for M_{57}	.078	.012	.269	.217
b_4 for M_{58}	−.014	.001	.073	.204
b_5 for V_{60} (volume)	.055	.103	.017	.0409
b_6 for T_{20} (bill yields)	.104	.095	.074	.0051
Constant	−.186	−.266	−.180	−.0134
t of b_1	3.975	8.786	10.415	12.13
t of b_2	.517	1.417	5.166	5.67
t of b_3	1.121	.221	4.635	5.50
t of b_4	−.285	.010	1.316	6.34
t of b_5	2.167	2.934	.592	2.07
t of b_6	2.113	4.175	2.694	.43
Number of observations	21	44	54	128
Mean of yield spread	.070	.148	.069	.096
S.D. of yield spread	.096	.159	.164	.150
S.E. of estimate	.004	.064	.079	.086
Multiple correlation coefficient	.950	.926	.892	.831
F statistic of multiple correlation coefficient	21.419	37.378	30.499	44.94

NOTE: See Appendix for definition of symbols.

errors is autoregressive, the least-squares estimates of the regression coefficients will be biased, even asymptotically.

Because of autocorrelation, the significance levels of the regression coefficients are lower than those indicated by the t-values listed. Second, the autocorrelation suggests that some errors may have been made in the specification of the relationship tested. That is, some significant variables may have been omitted or the form of the variables or the equation may be imperfect. Third, the coefficients of the change-in-yield variables may involve a bias, as already noted.

TIME REQUIRED FOR SEASONING. The above analysis of yield spreads is based on the assumption that there are no systematic differences be-

tween new and outstanding issues, other than coupon rate differences, that would account for any significant part of the spread. This implies that any spread which exists at the time of issue, after correction for coupon differences, should disappear after the new issue has been outstanding long enough for the market to equilibrate itself. Does the spread in fact vanish after the new bond has become seasoned? And, if so, how long does this take?

In order to make this part of the study meaningful, we had to select periods when new-seasoned spreads were reasonably high and remained high, so that the closing of the yield gap between individual recent issues and seasoned averages would not merely reflect the elimination of yield spreads between new and seasoned issues generally. The periods chosen were March through May 1953, May 1956 through March 1957, and June through September 1959.

The average yield spread on Aa utilities for all new issues during these periods was 9.0 basis points after correction for coupon. The average spread on these issues one month after the issue date was 3.8 basis points. After two months the spread was 3.1 basis points, after three months it was −1.0 basis points, and from then through the eighth month the average fluctuated within a narrow range above and below zero.

On the average, initial yield spreads on utilities thus appear to be eliminated within two to three months of the date of issue. White, using a somewhat different procedure, arrived at a similar conclusion.[62] Homer, in describing the recent issue market, wrote that "for a period up to, say, three months it [the volume of trading in a recent issue] will continue far larger than for seasoned bonds. At about that point trading activity will die out, and the issue will take its place as just one more seasoned utility." [63]

In addition, we carried out a brief study of the seasoning time required on federal obligations. The paucity and heterogeneity of new issues made it difficult to interpret the available data, but the indication seems to be that the new issue yield spread disappears somewhere between two and four months after issue. Our procedure was first to measure the monthend differences between the yields of bonds issued during the month and the corresponding point on the government yield curve. Omitting bills, certificates, and the 1½ per cent note series, there was a positive yield spread in thirty-eight cases and a negative yield

[62] White, p. 133.

[63] Homer, July 20, 1965 Letter.

spread in ten cases between March 1951 and December 1960.[64] The total spread among the bonds showing a positive spread was 352 basis points; the total for those showing a negative spread was 28 basis points. During the second month after issue the spread declined on twenty-seven issues and increased on seven; the decline was 164 basis points and the increase was 27. By the end of the third month twenty-eight issues had shown a decline in spread from that at the end of the first month, and eight showed an increase. In basis points the decline from the end of the first month was now 244. During the fourth month there was no change in the number of recent issues for which the spread had changed since time of issue, but the total spread declined 12 more basis points net. In the fifth month after issue the spread declined on three more issues, and the net spread in basis points did not change. From that time on the behavior of spreads was random.

These tests confirm that yield spreads are not due to systematic differences in the characteristics of new and outstanding issues (other than coupon rate), and tend to support a hypothesis explaining spreads in terms of market imperfections. The fact that the spreads persist for a period of two to three months after issue suggests that market imperfections prevent more rapid arbitrage. The tests are not inconsistent, however, with the hypothesis which attributes yield spreads partly to underwriting risk. The regression results, moreover, are consistent with both hypotheses. We now turn to three additional tests designed to evaluate these two hypotheses, as well as throw light on the connection between the new issue, recent issue, and seasoned issue markets.[65]

UNDERWRITING RISKS VERSUS MARKET IMPERFECTIONS AS AN EXPLANATION OF YIELD SPREADS. The first two of the following three tests deal with the market imperfections hypothesis, and the third deals with the underwriting risk hypothesis.

(1) Suppose new issue yields turn downward from month t to month $t+1$, but that even in month $t+1$ these yields are above those on seasoned bonds in month t. If yields in the seasoned issue market lag behind those in the new issue market, seasoned yields would continue

[64] The yield curves used in this study were those prepared by the Morgan Guaranty Trust Company.

[65] William H. White states in his study that "even though the amplitude of variation of the yields on seasoned bonds is smaller than that on new issues, the yields on the two types of bonds are closely synchronized in regard to the timing of peaks, troughs, and major discontinuous changes." White, p. 136.

to rise when new issue yields are above them, attempting to close the spread, despite the falling rates on new issues. If, on the other hand, seasoned yields turn downward along with new issue yields even though the new issue yields in month $t + 1$ exceed the seasoned yields in month t, it can be inferred that seasoned yields are directly influenced by yield-determining conditions and are not simply following a distributed lag adjustment toward their equilibrium level.

Using the Moody corporate Aa series on seasoned issues and new issues with the same coupon rate as the bonds in the seasoned average,[66] the seasoned yields continued to rise in twenty-two of the thirty-one cases where the new issue yield turned downward while remaining above the level of seasoned yields; the reverse occurred in nine of the thirty-one cases. Nothing conclusive can be inferred from this test, but it suggests that the seasoned market lags the new issue market and, therefore, supports the market imperfections hypothesis.

(2) Is the correlation between changes in seasoned yields and changes in new issue yields the month before higher than the correlation between changes in new issue yields and changes in seasoned yields the month before? An affirmative answer would support the hypothesis that seasoned yields tend to lag.

In the Moody Aa corporate series for the period from 1952 through 1963 (with the new issue series corrected for coupon as described above), virtually no correlation was found between the first-differences (one-month changes) of new issue yields and those of seasoned yields for the preceding month, but there was a substantial correlation (.50) between the first-differences of seasoned yields and those of new issue yields for the preceding month. The correlation between first-differences of new and seasoned yields for the same month was only slightly higher (.55).[67] Thus, when the first-difference in seasoned yields is regressed on the change in new issue yields in the same month and the preceding one the coefficient of multiple correlation is very high (.83), and can be raised slightly (to .86) by the addition of the new issue rate change for the second month earlier.[68]

[66] This latter series was derived by adding to Moody's seasoned series the new-seasoned spread measured between Moody's new issue series and the series for the yield on seasoned bonds with the same coupon rate as the new issue. The adjustment affected the correlations very little.

[67] There was no correlation between the first differences of new issue yields and those of new issue yields for the previous month, indicating that in predicting changes in seasoned yields the change in new issue yields for the previous month is not simply a proxy variable for the simultaneous new issue yield change.

[68] It is possible that some of this correlation may be explained by the fact that the new issue yield change of the preceding month is a proxy for the change in seasoned yields of

The preceding two experiments support the conclusion that market forces operate more rapidly on new issue yields than on seasoned ones. Seasoned yield movements appear to follow new issue yield movements with a distributed lag. The tests thus support the hypothesis that frictions in the seasoned issue market are a cause of new-seasoned yield spreads. They do not, however, preclude a role for the underwriting risk hypothesis. The third test involves an examination of the behavior of yields on recently issued bonds after their prices are freed from syndicate price maintenance agreements.

(3) If new issue yields are higher than yields on outstandings because of underwriters' pricing policies, issues recently released from syndicate should decline relative to new issues. A direct comparison of yields on recently released issues with new issue yields is not possible because there are not enough new issues, in the weeks following termination of a syndicate, with which to compare the yield on the newly released issue. Instead, the test examines the behavior of yields on recent issues during periods of some length when new issue yields were predominantly rising and new-seasoned spreads were large. If the yields on issues recently released from syndicate fell during such periods, this would provide strong support for the underwriting risk hypothesis.

Using the yield data for A, Aa, and Aaa utilities in the weekly issues of *Moody's Bond Survey,* we found the percentage of bond issues whose yields fell in the first week following the end of syndicate price maintenance agreements, and the change from offering yield during the first week, first two weeks, and first three weeks after release from syndicate. Table 5-11 shows these data for each of six periods between 1956 and 1966. The bottom line shows the average three-week change in new issue yields during these periods and can be compared to the line above it showing three-week changes on recently released issues.

It is evident from the first line of Table 5-11 that the yields on a substantial number of bonds fell immediately after the termination of the syndicate despite the fact that new issue yields were predominantly rising. Because of the erraticism of new issue yields, some of the decline in yields on recent issues could be due to short periods of falling new issue yields during the longer periods of rising yields. However, in four of the six periods more than half of the recent issues fell—well above what one would expect from erratic movements in new issue yields. Furthermore, comparing the lower two lines in every one of the six periods, the average yield change on recently released issues in

the preceding month. There is more autocorrelation in seasoned than in new issue yields.

TABLE 5-11. Changes in Yields on Recent Issues After Termination of Syndicate Price Maintenance Agreements, Compared With Yield Changes on All New Issues (*yield changes in basis points*)

	Feb. 28, 1956–Jan. 30, 1957	Feb. 5, 1957–June 27, 1957	Aug. 27, 1957–Nov. 20, 1957	April 22, 1959–Aug. 26, 1959	Sept. 14, 1960–Dec. 9, 1960	July 14, 1965–June 30, 1966
(1) Per cent of bond issues whose yields fell in the first week after the end of price maintenance agreements	53	57	73	62	40	35
(2) Average change in yield from offering yield on issues recently released from syndicate:						
(a) during first week	0.0	0.3	−1.8	1.3	1.9	2.8
(b) during first two weeks	−0.2	0.7	−5.0	−0.2	4.1	2.6
(c) during first three weeks	−3.4	0.6	−1.5	1.5	3.0	3.1
(3) Average three-week change in new issue yields	7.2	10.7	0.5	6.7	8.5	6.4

the three weeks following syndicate termination was either negative or, if positive, far less than the average three-week change in new issue yields.

The test thus suggests that there is, indeed, some tendency for underwriters to underprice new issues. This test is limited, however, to periods of rising new issue yields. It should be remembered, moreover, that evidence also exists that some of the new-seasoned spread is caused by imperfections in the capital markets. Thus, both hypotheses, the one concerning the pricing policies of underwriters and that concerning market imperfections, appear to have some validity.

THE SPREAD UNDER STABLE MARKET CONDITIONS. What conditions would lead to the elimination of the yield spread? It is tempting to approach this question through the regression equations, but this would place on the equations a burden they clearly are not equipped to handle. The value of the constants, for example, varies considerably among the different equations.

Nevertheless, the evidence gathered here on the determinants of the spread suggests that it would be close to zero under stable market conditions. With one possible exception the three determinants of a positive spread discussed above presuppose rising market rates. Under stable markets, coupon rates on new issues would be similar to those on seasoned issues;[69] frictions in the market for seasoned bonds would have no importance; and underwriters would not have to incorporate a premium in their offering yields based on an extrapolation of past yield increases. Of course, the underwriters' aversion to risk might be such that they will always include some "sweetener" in their offering yield. However, if this differential consistently resulted in extra profits under stable market conditions, competition among underwriters would quickly erode it away.[70]

The time series on yield differences during a few periods of rate stability are consistent with these speculations. During the second half of 1954, yield levels were stable and the yield differential hovered around zero (see Charts 5-1 and 5-2). Again in the relatively stable period from June 1962 to June 1963, yield differentials were only slightly positive on balance in the Homer series and slightly negative on balance in the Moody's series. This implies that the positive yield

[69] Yields would have to be stable for a fairly long period, of course, for this to hold true.

[70] It could make a difference in this regard whether the market was stable, or unstable but without trend.

spreads during the period 1952–63 reflect largely, if not entirely, the tendency for yields to rise on balance over that period.

Our explanation of yield spreads suggests further that a prolonged period of falling yields would result in predominantly negative spreads. Coupon rates on new issues would be lower than those on outstandings, and thus would cause a negative spread. Past yield declines, furthermore, would tend to generate a negative spread if market frictions prevented the prompt adjustment of yields on outstandings. The pricing policy of underwriters could also contribute to a negative spread if they tended to extrapolate past rate declines and if competition between them was intense. Evidence from the 1930's appears to confirm this. Comparison of a series of Moody Aa seasoned utility yields with new issue yields on Aa utilities revealed that, on the average, spreads were negative in 1931 and from 1933 to 1937.[71]

Appendix

KEY TO SYMBOLS

TYPE OF SERIES

Note: All yield series are monthly unless designated with a subscript q for quarterly.

B Bankers Trust, series of yields on Grade 2 public utility bonds.

C_q Avery Cohan, series of yields on Aa public utility bonds. Quarterly.

F Federal Reserve, series of yields on long-term U.S. government bonds.

G Salomon Brothers and Hutzler, series of yields on long-term U.S. government bonds.

H Sidney Homer, series of yields on Aa public utility bonds.

K Mortimer Kaplan, series of yields on "recently issued" Aa corporate bonds.

M Moody, series of yields on Aa corporate bonds.

S Ratio of volume of slow selling to total newly issued Aaa, Aa and A public utilities.

T Treasury bills, ninety-day, series of yields.

V Volume of newly issued securities.

[71] Braddock Hickman offers an alternative explanation, namely, the inability of agency ratings to keep up with market views. Since new issues came chiefly from firms with better prospects than others with similar ratings, their lower yield could be attributed in part to differences in investment quality among equally rated bonds. Braddock Hickman, *Corporate Bond Quality and Investor Experience*, Princeton for NBER, 1958, p. 298. See also William H. White, p. 127.

X Symbol used in the tables summarizing the regression equations to stand for the letter corresponding to the series studied. For example, X_{10} stands for M_{10} when used in a table for Moody data.

SUBSCRIPTS FOR SERIES

1–4 New-seasoned yields spreads, new issue yield minus seasoned issue yield; or underwriting yield spread.

10 Coupon difference, average new minus average seasoned issue coupon.

20–22 Level of yields, current month.

30–58 Change in new issue yields over various periods.

60–65 Variables relating to volume of new issues.

q Quarterly series.

Full Glossary

B BANKERS TRUST SERIES

B_1 Spread between yield on newly issued Bankers Trust Company Grade 2 public utilities and yield on seasoned Moody Aa public utilities. In percentage points. Both series are monthly averages of yields with issues weighted by volume in the case of the new issue average. (Sources: data obtained from Bankers Trust Company; *Moody's Bond Survey*)

B_{10} Average coupon difference between newly issued Bankers Trust Grade 2 utilities and seasoned Moody Aa utilities, 1957–63; average coupon difference on Moody Aa corporates, new versus seasoned issues, 1951–56. All in percentage points. (Sources: Bankers Trust Company; *Moody's Bond Survey*)

B_{20} Yield on newly issued Bankers Trust Company Grade 2 public utilities. In percentage points. (Source: Bankers Trust Company)

B_{30}–B_{41} B_{30} is the change in yield on new Bankers Trust Grade 2 utilities during the past month, measured as current yield minus yield of preceding month. B_{31} is the change for the month before the last, B_{32} is the change for the month before that, and so forth for B_{33} through B_{41}. In percentage points. (Source: Bankers Trust Company)

C_q COHAN SERIES (QUARTERLY)

C_{q20} Yield on newly issued Cohan Aa public utilities. The Cohan series consists of quarterly averages of yields on newly issued thirty-year Aa public utility mortgage bonds which were sold to underwriters at competitive bidding. In percentage points. (Source: Avery B. Cohan, "Yields on New Underwritten Corporate Bonds, 1935–1958," *The Journal of Finance*, December, 1962, and data supplied directly to us for 1959–60)

F FEDERAL RESERVE SERIES

F_{21} Yield on outstanding long-term U.S. government bonds, Federal Reserve series. Yields are monthly averages of daily quotations. (Source: *Federal Reserve Bulletin*)

F_{30}–F_{53} F_{30} is the change in yield on outstanding long-term government bonds, Federal Reserve series, current yield minus yield of preceding month. F_{31} is the change for the month before last, F_{32} is the change for the month before that, and so forth for F_{33} through F_{53}. (Source: *Federal Reserve Bulletin*)

G SALOMON BROTHERS AND HUTZLER

G_{21} Yield on outstanding long-term U.S. government bonds, Salomon Brothers and Hutzler series. Yields are for the first of the month. (Source: Salomon Brothers and Hutzler, "An Analytical Record of Yields and Yield Spreads")

G_{30-53} G_{30} is the change in yield on outstanding long-term government bonds, Salomon Brothers and Hutzler series, current yield minus yield of preceding month. G_{31} is the change for the month before last, G_{32} is the change for the month before that, and so forth for G_{33} through G_{53}. (Source: Salomon Brothers and Hutzler)

H HOMER SERIES

H_1 Spread between the yield on Homer's newly issued callable Aa public utilities and the yield on Homer's seasoned callable Aa public utility bonds with $2\frac{3}{4}$–$2\frac{7}{8}$ per cent coupon. In percentage points. Both the new issue and seasoned issue series are for yields as of the first of each month. (Source: Salomon Brothers and Hutzler; Mark W. Frankena)

H_2 Spread between the yield on new callable issues of Aa public utility bonds, Homer series, and the yield on seasoned callable Aa public utility bonds of current coupon. The yield on seasoned bonds of current coupon means the estimated yield on seasoned bonds with coupon rate equal to that on new issues for that date. This yield is calculated by interpolation and extrapolation of yields on seasoned bonds in various coupon groups. In percentage points. The series are for the first of the month. (Source: Salomon Brothers and Hutzler; Mark W. Frankena)

H_{10} Difference between average coupon on newly issued Homer Aa utilities and the $2\frac{3}{4}$–$2\frac{7}{8}$ per cent coupon rate. (Source: data obtained from Sidney Homer and Mark W. Frankena)

H_{20} Yield on new issues, callable Aa public utility bonds, Homer series. (Source: Salomon Brothers and Hutzler)

H_{21} Yield on seasoned issues with $2\frac{3}{4}$–$2\frac{7}{8}$ coupon, callable Aa public utility bonds, Homer series. (Source: Salomon Brothers and Hutzler; Mark W. Frankena)

H_{22} Yield on seasoned issues with coupon rate equal to that on new issues,

callable Aa public utility bonds, Homer series. (Source: Salomon Brothers and Hutzler; Mark W. Frankena)

H_{30}–H_{41} H_{30} is the change in yield on new Aa public utility bonds, Homer series, current yield minus yield of preceding month. H_{31} is the change for the month before last, H_{32} is the change for the month before that, and so forth for H_{33} through H_{41}. (Source: Salomon Brothers and Hutzler)

H_{56} Change in yield on newly issued Aa public utility bonds, Homer series, yield in preceding month minus average yield for two to three months preceding. In percentage points. (Source: Salomon Brothers and Hutzler)

H_{57} Change in yield on newly issued Aa public utility bonds, Homer series, average yield of two to three months preceding minus average yield for four to six months preceding. In percentage points. (Source: Salomon Brothers and Hutzler)

H_{58} Change in yield on newly issued Aa public utility bonds, Homer series, average yield for four to six months preceding minus average yield for seven to twelve months preceding. In percentage points. (Source: Salomon Brothers and Hutzler)

K KAPLAN SERIES

K_1 Spread between yield on Kaplan recently issued Aa corporate bonds and yield on Moody's seasoned Aa corporate bonds. In percentage points. The Kaplan series is for monthly averages of Friday yields for recently issued bonds and the Moody series is for monthly averages of yields. (Sources: *Moody's Bond Survey* and data from Mortimer Kaplan, Federal Housing Administration)

K_{10} Average coupon difference between Kaplan recently issued Aa corporates and Moody seasoned Aa corporates. (Sources: Moody's Investors' Service; Mortimer Kaplan)

K_{20} Yield on recently issued Aa corporates, Kaplan series. (Source: Mortimer Kaplan)

K_{30}–K_{33} K_{30} is the change in yield on recently issued Aa corporate bonds, Kaplan series, current yield minus yield of preceding month. K_{31} is the change for the month before last, K_{32} is the change for the month before that, and K_{33} is the change for the month before that. In percentage points. (Source: Mortimer Kaplan)

M MOODY SERIES

M_1 Spread between yield on newly issued Aa corporates and yield on seasoned Moody Aa corporates. Newly issued yields are Moody's specially computed averages of offering yields on new issues (other than convertibles, issues with warrants, and equipment trusts), weighted by amounts offered. Seasoned yields are Moody's monthly average (averages of daily figures) and includes yields on securities with various coupon rates. Figures are in percentage points. (Source: *Moody's Bond Survey*)

M_2 Spread between the yield on newly issued Aa corporates, Moody series, and the yield on seasoned Aa corporates with coupon rate equal to that on new issues. In percentage points. (Source: Moody's Investors' Service)

M_4 Moody new-seasoned yield spread as described under M_1 *plus* underwriter spread, which is the difference between the yield to maturity calculated from the offering price and the yield to maturity calculated from the price at which the issue was sold to the underwriter. Underwriter spread thus measures the difference between the investor's return to maturity and the actual interest cost to the borrower. The underwriter spread is an average for newly issued Aa corporates weighted by size of issue.

M_{10} Difference between average coupon on newly issued Moody Aa corporates and average coupon on seasoned Moody Aa corporates. (Source: *Moody's Bond Survey*)

M_{20} Yield on newly issued Aa corporates, Moody series. (Source: *Moody's Bond Survey*)

M_{21} Yield on seasoned Aa corporates, Moody series. (Source: *Moody's Bond Survey*)

M_{22} Yield on seasoned Aa corporates with coupon rate equal to that on new issues, Moody series. (Source: derived from data supplied by Moody's Investors Service)

M_{30}–M_{41} M_{30} is the change in yield on newly issued Aa corporates, Moody series, current yield minus yield of preceding month. M_{31} is the change for the month before last, M_{32} is the change for the month before that, and so forth for M_{33} through M_{41}. In percentage points. (Source: *Moody's Bond Survey*)

M_{56} Change in yield on newly issued Aa corporates, Moody series, yield in preceding month minus average yield for two to three months preceding. In percentage points. (Source: *Moody's Bond Survey*)

M_{57} Change in yield on newly issued Aa corporates, Moody series, average yield of two to three months preceding minus average yield for four to six months preceding. In percentage points. (Source: *Moody's Bond Survey*)

M_{58} Change in yield on newly issued Aa corporates, Moody series, average yield for four to six months preceding minus average yield for seven to twelve months preceding. In percentage points. (Source: *Moody's Bond Survey*)

S SLOW-SELLING ISSUES

S_{60} Ratio of volume of slow-selling to total new Aaa, Aa and A public utility issues. Ratio applies to month preceding the observation of yield spread being explained. (Source: data from Sidney Homer)

S_{61} Ratio of volume of slow-selling to total new Aaa, Aa and A public utility issues. Ratio applies to next to last month before the observation of yield spread being explained. (Source: Sidney Homer)

T TREASURY BILLS

T_{20} Monthly average of yields on newly issued three-month Treasury bills. In percentage points. (Source: *Federal Reserve Bulletin*)

T_{21} Yield on newly issued three-month Treasury bills on the Monday nearest the first of each month. In percentage points. (Source: *Federal Reserve Bulletin*)

V VOLUME OF NEW ISSUED SECURITIES

V_{60} Volume of newly issued corporate securities, including bonds and equities, issued in the current and preceding month. In billions of dollars. (Source: *Federal Reserve Bulletin*)

V_{61} Volume of newly issued corporate securities, including bonds and equities, issued in the current and the two preceding months. In billions of dollars. (Source: *Federal Reserve Bulletin*)

V_{62} Volume of newly issued corporate securities, including bonds and equities, issued in the current and three preceding months. In billions of dollars. (Source: *Federal Reserve Bulletin*)

V_{63} Volume of newly issued corporate securities, including bonds and equities, issued in the two preceding months. In billions of dollars. (Source: *Federal Reserve Bulletin*)

V_{64} Volume of newly issued corporate bonds, including public offerings and private placements, issued in the current and two preceding months. In billions of dollars. (Source: *Federal Reserve Bulletin*)

V_{65} Volume of newly issued corporate bonds, including public offerings and private placements, issued in the three preceding months. In billions of dollars. (Source: *Federal Reserve Bulletin*)

TABLE B_1. Spread Between Yield on Newly Issued Bankers Trust Company Grade 2 Public Utilities and Yield on Seasoned Moody Aa Public Utilities

	January	February	March	April	May	June	July	August	September	October	November	December
1952	.21	.27	.25	.15	.16	.19	.17	.19	.22	.18	.16	.13
1953	.12	.18	.20	.27	.33	.35	.27	.26	.28	.15	.10	.12
1954	.10	.02	.05	.06	.09	.04	.03	.07	.10	.05	.06	.08
1955	.12	.12	.16	.13	.17	.11	.17	.33	.11	.07	.11	.14
1956	.08	.07	.22	.30	.30	.21	.38	.65	.51	.47	.54	.51
1957	.64	.44	.51	.60	.80	1.02	.75	.66	.53	.60	.55	.38
1958	.02	.15	.41	.17	.28	.24	.24	.45	.51	.25	.25	.35
1959	.37	.21	.15	.27	.40	.29	.29	.35	.60	.42	.53	.58
1960	.23	.44	.31	.38	.39	.19	.15	.19	.23	.23	.37	.45
1961	.10	.04	.02	.28	.22	.30	.18	.18	−.02	−.14	.03	.08
1962	.03	−.04	−.10	−.14	−.17	−.10	−.07	−.06	−.16	−.11	−.10	−.12
1963	−.12	−.11	−.05	.03	.01	−.01	−02	−.02	.01	−.04	−.02	.04

TABLE B_{20}. Yield on Newly Issued Bankers Trust Company Grade 2 Public Utilities

	January	February	March	April	May	June	July	August	September	October	November	December
1951	2.75	2.81	2.96	3.16	3.21	3.45	3.35	3.12	3.10	3.21	3.27	3.28
1952	3.27	3.28	3.30	3.17	3.18	3.23	3.22	3.25	3.28	3.26	3.21	3.18
1953	3.23	3.36	3.42	3.62	3.83	3.92	3.68	3.64	3.70	3.42	3.30	3.33
1954	3.24	3.05	2.98	3.00	3.06	3.04	3.02	3.05	3.10	3.04	3.05	3.07
1955	3.13	3.18	3.25	3.21	3.28	3.23	3.30	3.50	3.32	3.25	3.28	3.37
1956	3.25	3.20	3.38	3.60	3.64	3.55	3.75	4.13	4.12	4.16	4.30	4.35
1957	4.51	4.25	4.31	4.40	4.65	4.96	4.85	4.91	4.84	4.92	4.85	4.43
1958	3.75	3.83	4.14	3.89	3.97	3.94	4.03	4.42	4.75	4.54	4.50	4.57
1959	4.64	4.52	4.45	4.67	4.96	4.96	4.93	4.95	5.32	5.22	5.21	5.28
1960	5.00	5.12	4.90	4.92	4.96	4.77	4.69	4.55	4.59	4.65	4.82	4.94
1961	4.58	4.44	4.36	4.65	4.63	4.75	4.71	4.75	4.57	4.42	4.57	4.64
1962	4.58	4.52	4.43	4.35	4.26	4.34	4.42	4.43	4.30	4.30	4.30	4.26
1963	4.25	4.25	4.29	4.38	4.37	4.35	4.37	4.38	4.42	4.39	4.42	4.50

TABLE C_{q20}. Yield on Newly Issued Cohan Aa Public Utilities, by Quarters

	First	Second	Third	Fourth		First	Second	Third	Fourth
1952	3.22	3.17	3.18	3.13	1957	4.37	4.58	4.79	4.72
1953	3.35	3.69	3.68	3.33	1958	3.96	3.87	4.18	4.47
1954	3.06	3.02	3.02	3.03	1959	4.49	4.85	4.86	5.15
1955	3.15	3.23	3.32	3.30	1960	4.90	4.85	4.60	4.80
1956	3.24	3.58	3.96	4.25					

TABLE H_1. Spread Between the Yield on Homer's Newly Issued Callable Aa Public Utilities and the Yield on Homer's Seasoned Callable Aa Public Utility Bonds With $2\frac{3}{4}$–$2\frac{7}{8}$ Per Cent Coupon

	January	February	March	April	May	June	July	August	September	October	November	December
1952	.14	.11	.08	.14	.08	.12	.13	.12	.14	.10	.08	.10
1953	.07	.06	.15	.17	.26	.26	.27	.25	.19	.22	.08	.08
1954	.13	.01	−.01	.03	.04	.09	.01	.03	.06	.06	.04	.06
1955	.04	.08	.08	.13	.10	.12	.06	.07	.17	.12	.08	.13
1956	.09	.08	.03	.23	.37	.28	.39	.47	.45	.37	.50	.47
1957	.62	.64	.53	.61	.57	.75	.73	.71	.49	.54	.76	.43
1958	.34	.15	.39	.34	.37	.29	.33	.43	.46	.40	.31	.46
1959	.42	.40	.20	.20	.13	.45	.37	.30	.41	.52	.56	.63
1960	.59	.32	.58	.44	.42	.38	.35	.39	.30	.40	.49	.63
1961	.29	.06	.20	.32	.42	.42	.43	.20	.26	.12	.15	.20
1962	.21	.13	.15	.09	.09	.06	.11	.10	.05	.11	.13	.15
1963	.13	.05	.13	.12	.14	.10	.07	.10	.10	.08	.10	.12
1964	.11	.09	.06	.09	.05	.07	.04	.04	.07	.07	.07	.09
1965	.06	.02	.09	.09	.08	.17	.13	.15	.18	.17	.11	.15
1966	.15	.21	.35	.14	.43	.62	.60	.57	.84	.54	.66	.85
1967	.62	.29	.61	.42	.67	.56						

TABLE H_2. Spread Between the Yield on New Callable Issues of Aa Public Utility Bonds, Homer Series, and the Yield on Seasoned Callable Aa Public Utility Bonds of Current Coupon

	January	February	March	April	May	June	July	August	September	October	November	December
1952	.14	.09	.08	.08	.02	.07	.09	.09	.09	.05	.06	.06
1953	.07	.08	.06	.10	.15	.18	.13	.10	.12	.05	.03	.06
1954	.05	−.06	−.06	−.02	−.02	.04	−.03	−.03	.03	.01	−.01	.01
1955	−.02	.05	.05	.09	.08	.10	.06	.06	.12	.09	.04	.11
1956	.06	.07	.02	.15	.21	.12	.15	.20	.17	.11	.20	.25
1957	.20	.17	.10	.14	.13	.19	.21	.30	.15	.08	.24	.05
1958	.11	.04	.11	.14	.11	.00	.10	.16	.28	.13	.12	.20
1959	.18	.17	.09	.07	.04	.25	.23	.13	.13	.21	.12	.13
1960	.22	.03	.15	.04	.01	.04	.07	.11	.03	.04	.11	.21
1961	−.01	−.05	.05	.11	.16	.12	.08	.00	.14	.06	.06	.13
1962	.14	.05	.10	.05	.04	.02	.08	.11	.05	.06	.02	.07
1963	.06	.03	.04	.03	.08	.07	.05	.04	.04	.05	.05	.06
1964	.04	.01	.04	.05	.03	.05	.00	−.01	.04	.03	.03	.05
1965	.02	−.01	.03	.03	.02	.07	.04	.05	.05	.07	.02	.04
1966	.05	.05										

TABLE H_{10}. Average Coupon Rate on Homer Newly Issued, Callable Aa Public Utilities [a]

	January	February	March	April	May	June	July	August	September	October	November	December
1952	$3\frac{3}{8}$	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{1}{4}$
1953	$3\frac{1}{4}$	$3\frac{3}{8}$	$3\frac{1}{2}$	$3\frac{5}{8}$	$3\frac{7}{8}$	$3\frac{7}{8}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$3\frac{5}{8}$	$3\frac{5}{8}$	$3\frac{3}{8}$	$3\frac{3}{8}$
1954	$3\frac{3}{8}$	$3\frac{1}{8}$	3	3	$3\frac{1}{8}$	$3\frac{1}{4}$	$3\frac{1}{8}$	$3\frac{1}{8}$	$3\frac{1}{8}$	$3\frac{1}{8}$	$3\frac{1}{8}$	$3\frac{1}{8}$
1955	$3\frac{1}{8}$	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{3}{8}$	$3\frac{1}{4}$	$3\frac{3}{8}$	$3\frac{1}{2}$	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{3}{8}$
1956	$3\frac{3}{8}$	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{3}{4}$	$3\frac{5}{8}$	$3\frac{3}{4}$	4	$4\frac{1}{8}$	$4\frac{1}{8}$	$4\frac{1}{4}$	$4\frac{3}{8}$
1957	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{3}{8}$	$4\frac{3}{8}$	$4\frac{3}{8}$	$4\frac{5}{8}$	$4\frac{7}{8}$	5	$4\frac{7}{8}$	$4\frac{7}{8}$	5	$4\frac{1}{2}$
1958	$3\frac{7}{8}-4$	$3\frac{3}{4}$	$4\frac{1}{8}$	4	$3\frac{7}{8}$	4	4	$4\frac{3}{8}$	$4\frac{5}{8}$	$4\frac{5}{8}$	$4\frac{3}{8}$	$4\frac{5}{8}$
1959	$4\frac{5}{8}$	$4\frac{3}{4}$	$4\frac{3}{8}$	$4\frac{5}{8}$	$4\frac{5}{8}$	$4\frac{1}{8}$	5	5	5	$5\frac{1}{4}$	$5\frac{1}{4}$	$5\frac{1}{4}$
1960	$5\frac{1}{4}$	5	$5\frac{1}{8}$	$4\frac{7}{8}$	5	5	$4\frac{7}{8}$	$4\frac{5}{8}$	$4\frac{1}{2}$	$4\frac{3}{4}$	$4\frac{3}{4}$	5
1961	$4\frac{5}{8}$	$4\frac{3}{8}$	$4\frac{3}{8}$	$4\frac{5}{8}$	$4\frac{3}{4}$	$4\frac{3}{4}$	5	$4\frac{3}{4}$	$4\frac{3}{4}$	$4\frac{1}{2}-\frac{5}{8}$	$4\frac{5}{8}$	$4\frac{5}{8}$
1962	$4\frac{5}{8}$	$4\frac{5}{8}$	$4\frac{1}{2}$	$4\frac{3}{8}$	$4\frac{3}{8}$	$4\frac{3}{8}$	$4\frac{3}{8}$	$4\frac{1}{2}$	$4\frac{3}{8}$	$4\frac{3}{8}$	$4\frac{3}{8}$	$4\frac{3}{8}$
1963	$4\frac{3}{8}$	$4\frac{1}{4}$	$4\frac{3}{8}$	$4\frac{3}{8}$	$4\frac{3}{8}$	$4\frac{3}{8}$	$4\frac{3}{8}$	$4\frac{3}{8}$	$4\frac{3}{8}$	$4\frac{3}{8}$	$4\frac{1}{2}$	$4\frac{1}{2}$
1964	$4\frac{5}{8}$	$4\frac{1}{2}$	$4\frac{3}{8}$	$4\frac{5}{8}$	$4\frac{5}{8}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{5}{8}$	$4\frac{5}{8}$	$4\frac{5}{8}$
1965	$4\frac{5}{8}$	$4\frac{1}{2}$	$4\frac{5}{8}$	$4\frac{5}{8}$	$4\frac{5}{8}$	$4\frac{5}{8}$	$4\frac{5}{8}$	$4\frac{5}{8}$	$4\frac{3}{4}$	$4\frac{3}{4}$	$4\frac{3}{4}$	$4\frac{7}{8}$
1966	5	5										

[a] The difference between the average coupon rate on newly issued Homer Aa utilities and the $2\frac{3}{4}-\frac{7}{8}$ per cent coupon rate is derived by subtracting $2\frac{3}{4}$ per cent from the following coupon rates.

TABLE H_{20}. Yield on New Issues, Callable Aa Public Utility Bonds, Homer Series

	January	February	March	April	May	June	July	August	September	October	November	December
1951	2.80	2.80	2.90	3.05	3.10	3.20	3.35	3.20	3.01	3.14	3.23	3.30
1952	3.28	3.13	3.18	3.19	3.15	3.19	3.21	3.21	3.20	3.19	3.17	3.13
1953	3.19	3.26	3.40	3.45	3.75	3.78	3.73	3.60	3.65	3.50	3.22	3.30
1954	3.23	3.05	2.90	2.93	3.00	3.10	3.00	3.00	3.05	3.03	3.00	3.02
1955	3.00	3.14	3.20	3.20	3.20	3.25	3.20	3.25	3.40	3.30	3.22	3.32
1956	3.25	3.20	3.15	3.45	3.70	3.57	3.73	3.90	4.07	4.01	4.20	4.30
1957	4.50	4.40	4.22	4.29	4.35	4.62	4.85	5.00	4.81	4.78	4.97	4.47
1958	3.94	3.70	4.00	4.00	3.90	3.85	3.95	4.25	4.60	4.57	4.42	4.55
1959	4.60	4.65	4.37	4.47	4.59	5.05	4.95	4.85	5.00	5.25	5.15	5.15
1960	5.25	4.95	5.10	4.85	4.88	4.90	4.80	4.60	4.47	4.65	4.75	5.00
1961	4.60	4.32	4.32	4.52	4.75	4.75	4.85	4.65	4.75	4.55	4.52	4.60
1962	4.65	4.55	4.55	4.40	4.29	4.29	4.39	4.47	4.30	4.30	4.26	4.28
1963	4.28	4.19	4.27	4.27	4.39	4.35	4.32	4.35	4.35	4.38	4.40	4.43
1964	4.50	4.42	4.39	4.50	4.48	4.48	4.44	4.42	4.45	4.47	4.47	4.50
1965	4.45	4.39	4.47	4.48	4.48	4.59	4.56	4.60	4.67	4.70	4.66	4.80
1966	4.90	4.98	5.30	5.15	5.50	5.67	5.67	5.77	6.35	6.05	6.00	6.20
1967	5.85	5.20	5.70	5.55	5.80	5.95						

TABLE H_{21}. Yield on Seasoned Issues With $2\frac{3}{4}$–$2\frac{7}{8}$ Coupon, Callable Aa Public Utility Bonds, Homer Series

	January	February	March	April	May	June	July	August	September	October	November	December
1952	3.14	3.02	3.10	3.05	3.07	3.07	3.08	3.09	3.06	3.09	3.09	3.03
1953	3.12	3.20	3.25	3.28	3.49	3.52	3.46	3.35	3.46	3.28	3.14	3.22
1954	3.10	3.04	2.91	2.90	2.96	3.01	2.99	2.97	2.99	2.97	2.96	2.96
1955	2.96	3.06	3.12	3.07	3.10	3.13	3.14	3.18	3.23	3.18	3.14	3.19
1956	3.16	3.12	3.12	3.22	3.33	3.29	3.34	3.43	3.62	3.64	3.70	3.83
1957	3.88	3.76	3.69	3.68	3.78	3.87	4.12	4.29	4.32	4.24	4.21	4.04
1958	3.60	3.55	3.61	3.66	3.53	3.56	3.62	3.82	4.14	4.17	4.11	4.09
1959	4.18	4.25	4.17	4.27	4.46	4.60	4.58	4.55	4.59	4.73	4.59	4.52
1960	4.66	4.63	4.52	4.41	4.46	4.52	4.45	4.21	4.17	4.25	4.26	4.37
1961	4.31	4.26	4.12	4.20	4.33	4.33	4.42	4.45	4.49	4.43	4.37	4.40
1962	4.44	4.42	4.40	4.31	4.20	4.23	4.28	4.37	4.25	4.19	4.13	4.13
1963	4.15	4.14	4.14	4.15	4.25	4.25	4.25	4.25	4.25	4.30	4.30	4.31
1964	4.39	4.33	4.33	4.41	4.43	4.41	4.40	4.38	4.38	4.40	4.40	4.41
1965	4.39	4.37	4.38	4.39	4.40	4.42	4.43	4.45	4.49	4.53	4.55	4.65
1966	4.75	4.77	4.95	5.01	5.03	5.05	5.07	5.20	5.51	5.51	5.34	5.35
1967	5.23	4.91	5.09	5.07	5.13	5.39	5.66	5.68	5.75	5.75		

TABLE H_{22}. Yield on Seasoned Issues of Current Coupon, Callable Aa Public Utility Bonds, Homer Series

	January	February	March	April	May	June	July	August	September	October	November	December
1952	3.14	3.04	3.10	3.11	3.13	3.12	3.12	3.12	3.11	3.14	3.11	3.07
1953	3.12	3.18	3.34	3.35	3.60	3.60	3.60	3.50	3.53	3.45	3.19	3.24
1954	3.18	3.11	2.96	2.95	3.02	3.06	3.03	3.03	3.02	3.02	3.01	3.01
1955	3.02	3.09	3.15	3.11	3.12	3.15	3.14	3.19	3.28	3.21	3.18	3.21
1956	3.19	3.13	3.13	3.30	3.49	3.45	3.58	3.70	3.90	3.90	4.00	4.05
1957	4.30	4.23	4.12	4.15	4.22	4.43	4.64	4.70	4.66	4.70	4.73	4.42
1958	3.83	3.66	3.89	3.86	3.79	3.85	3.85	4.09	4.32	4.44	4.30	4.35
1959	4.42	4.48	4.28	4.40	4.55	4.80	4.72	4.72	4.87	5.04	5.03	5.02
1960	5.03	4.92	4.95	4.81	4.87	4.86	4.73	4.49	4.44	4.61	4.64	4.79
1961	4.61	4.37	4.27	4.41	4.59	4.63	4.77	4.65	4.61	4.49	4.46	4.47
1962	4.51	4.50	4.45	4.35	4.25	4.27	4.31	4.36	4.25	4.24	4.24	4.21
1963	4.22	4.16	4.23	4.24	4.31	4.28	4.27	4.31	4.31	4.33	4.35	4.37
1964	4.46	4.41	4.35	4.45	4.45	4.43	4.44	4.43	4.41	4.44	4.44	4.45
1965	4.43	4.40	4.44	4.45	4.46	4.52	4.52	4.55	4.62	4.63	4.64	4.76
1966	4.85	4.93										

TABLE K_1. Spread Between Yield on Kaplan Recently Issued Aa Corporate Bonds and Yield on Moody Seasoned Aa Corporate Bonds

	January	February	March	April	May	June	July	August	September	October	November	December
1952	.13	.10	.13	.16	.17	.15	.16	.14	.11	.10	.06	.07
1953	.18	.18	.16	.16	.26	.34	.29	.27	.26	.15	.11	.02
1954	−.02	.01	−.04	.01	−.03	−.03	−.03	−.03	−.01	−.03	−.04	−.04
1955	−.01	.03	.03	.02	.03	.06	.07	.06	.07	.07	.02	.02
1956	.02	−.01	.04	.15	.16	.19	.22	.31	.25	.19	.15	.21
1957	.30	.45	.51	.52	.51	.66	.65	.54	.48	.51	.47	.32
1958	.47	.07	.23	.14	.10	.07	.11	.17	.22	.18	.10	.22
1959	.26	.24	.18	.16	.18	.21	.15	.18	.35	.31	.38	.42
1960	.32	.25	.31	.27	.29	.25	.17	.16	.20	.20	.20	.28
1961	.21	.10	.04	.13	.14	.22	.15	.10	.03	−.01	−.03	−.02
1962	−.06	−.08	−.10	−.15	−.16	−.18	−.15	−.16	−.15	−.14	−.13	−.11
1963	−.13	−.11	−.09	−.03	−.02	−.04	−.07	−.09	−.05	−.07	−.06	−.04

TABLE K_{10}. Average Coupon Rate on Kaplan Recently Issued Aa Corporates [a]

	January	February	March	April	May	June	July	August	September	October	November	December
1952	3.38	3.33	3.33	3.32	3.30	3.27	3.30	3.31	3.30	3.25	3.25	3.25
1953	3.25	3.31	3.40	3.41	3.64	3.86	3.89	3.88	3.82	3.71	3.63	3.43
1954	3.41	3.33	3.16	3.09	2.99	3.05	3.07	3.11	3.10	3.12	3.10	3.12
1955	3.13	3.13	3.17	3.18	3.20	3.27	3.30	3.31	3.38	3.38	3.29	3.31
1956	3.33	3.30	3.29	3.39	3.55	3.62	3.65	3.75	3.89	3.98	3.86	4.08
1957	4.33	4.52	4.44	4.36	4.40	4.69	4.86	4.87	4.92	4.97	4.93	4.82
1958	4.67	3.88	4.09	4.09	4.04	3.94	3.94	3.99	4.22	4.47	4.48	4.55
1959	4.59	4.68	4.56	4.52	4.58	4.82	4.89	4.88	5.01	5.22	5.34	5.33
1960	5.28	5.21	5.10	4.93	4.93	4.99	4.90	4.88	4.73	4.60	4.66	4.88
1961	4.94	4.76	4.58	4.50	4.62	4.65	4.74	4.78	4.80	4.75	4.68	4.58
1962	4.58	4.57	4.57	4.48	4.33	4.28	4.28	4.40	4.45	4.39	4.38	4.36
1963	4.36	4.33	4.29	4.31	4.41	4.43	4.38	4.34	4.34	4.36	4.37	4.43

[a] The difference between the average coupon rate on Kaplan recent issues and the average coupon rate on Moody seasoned Aa corporates, is derived by subtracting the average coupon rate on seasoned Moody Aa corporates from the following coupon rates.

TABLE K_{20}. Yield on Recently Issued Aa Corporates, Kaplan Series

	January	February	March	April	May	June	July	August	September	October	November	December
1951	2.70	2.73	2.91	3.01	2.99	3.07	3.09	3.01	2.99	2.97	3.19	3.23
1952	3.18	3.11	3.16	3.17	3.17	3.18	3.20	3.20	3.18	3.18	3.12	3.12
1953	3.27	3.32	3.34	3.45	3.67	3.84	3.71	3.66	3.69	3.48	3.38	3.30
1954	3.20	3.13	2.99	3.01	3.00	3.03	3.01	3.00	3.03	3.01	3.00	3.00
1955	3.05	3.13	3.16	3.15	3.18	3.20	3.21	3.26	3.29	3.26	3.20	3.24
1956	3.21	3.15	3.22	3.45	3.50	3.54	3.61	3.81	3.88	3.88	3.91	4.06
1957	4.19	4.28	4.31	4.31	4.34	4.64	4.75	4.75	4.74	4.79	4.76	4.40
1958	4.28	3.84	4.01	3.92	3.88	3.85	3.94	4.15	4.42	4.39	4.31	4.40
1959	4.48	4.48	4.41	4.48	4.64	4.77	4.73	4.76	5.04	5.07	5.08	5.16
1960	5.09	4.96	4.93	4.85	4.90	4.85	4.73	4.60	4.61	4.64	4.67	4.78
1961	4.69	4.50	4.38	4.50	4.55	4.67	4.68	4.67	4.62	4.55	4.51	4.54
1962	4.49	4.48	4.43	4.34	4.27	4.26	4.34	4.33	4.31	4.27	4.27	4.27
1963	4.24	4.25	4.25	4.32	4.34	4.32	4.32	4.31	4.36	4.36	4.38	4.42

TABLE M_1. Spread Between Yield on Newly Issued Moody Aa Corporates and Yield on Seasoned Moody Aa Corporates

	January	February	March	April	May	June	July	August	September	October	November	December
1952	.09	.04	.23	.13	.14	.19	.15	—	—	.09	.03	.09
1953	.15	.25	.22	.30	.47	—	.26	.23	.42	−.13	.01	.02
1954	−.03	−.09	−.12	−.01	.03	−.06	—	−.06	.07	−.06	.06	−.02
1955	.08	.04	.15	—	.09	.06	—	.30	.10	.06	.05	.10
1956	—	−.01	.09	.42	.28	.20	.29	.62	.35	.35	.54	.45
1957	.47	.43	.50	.50	.59	.90	.59	.68	.53	.63	.40	.35
1958	−.09	.15	.31	.07	.10	.03	.15	.54	.48	.31	.26	.32
1959	.37	.11	.17	.27	.42	.42	.35	.35	.79	.36	.51	.42
1960	.15	.33	.12	.36	.27	.16	.09	−.02	.21	.18	.27	.47
1961	.04	—	.03	.19	.15	.27	.12	.15	−.09	−.11	−.06	.00
1962	.00	−.05	−.13	−.14	−.15	−.18	−.07	−.10	−.19	−.15	−.16	−.06
1963	−.17	−.09	−.08	.02	−.02	−.05	−.04	−.07	−.06	−.04	−.03	.03
1964	−.04	−.08	.03	—	−.04	−.03	−.08	−.07	.02	—	—	.00
1965	—	−.03	.03	−.01	.02	.07	.03	.11	.08	−.01	.04	.12
1966	.07	.22	.30	.10	.15	.49	.52	.50	.32	.29	.32	.45
1967	.09	.08	.22	.17	.30	.26	.24	.42	.22	.39		

TABLE M_2. Spread Between the Yield on Newly Issued Aa Corporates, Moody Series, and the Estimated Yield on Seasoned Aa Corporates, Coupon Rate Equal to That on New Issues

	January	February	March	April	May	June	July	August	September	October	November	December
1952	.05	.00	.14	.11	.10	.12	.13	—	—	.03	−.03	.10
1953	.08	.20	.12	.18	.20	—	.06	.13	.09	−.16	.03	.05
1954	−.02	−.09	−.08	−.01	.01	−.02	—	−.06	.06	−.06	.05	−.02
1955	.06	.03	.15	—	.09	.06	—	.22	.06	.04	.05	.08
1956	—	.00	.06	.40	.19	.12	.21	.46	.12	.04	.38	.27
1957	.29	.28	.32	.29	.20	.58	.34	.35	.17	.44	.19	.15
1958	−.05	.10	.16	−.02	.00	.01	.05	.26	.30	.12	.10	.12
1959	.19	.03	.07	.15	.26	.30	.25	.25	.72	.22	.35	.28
1960	.06	.24	−.08	.12	.08	−.04	−.11	.00	−.01	−.18	−.08	.18
1961	−.175	—	−.07	.06	.06	.20	.02	.12	−.145	−.16	−.11	−.02
1962	.02	−.03	−.105	−.06	−.10	−.03	.025	.02	.00	−.02	−.03	.07
1963	−.09	.04	.01	.09	.05	.03	.05	.01	.015	.03	.035	.08

TABLE M_4. Moody New-Seasoned Yield Spread as Described Under M_1 Plus Underwriter Spread [a]

	January	February	March	April	May	June	July	August	September	October	November	December
1952	.080	.020	.040	.049	.043	.032	.070	—	—	.030	.037	.043
1953	.030	.048	.032	.059	.046	—	.040	.040	.009	.030	.030	.030
1954	.030	.029	.119	.015	.025	.052	.070	.030	.029	.034	.035	.020
1955	.032	.030	.030	—	.033	.026	—	.030	.030	.030	.024	.039
1956	—	.030	.027	.050	.045	.040	.033	.060	.053	.050	.042	.040
1957	.057	.048	.040	.050	.050	.073	.059	.050	.051	.040	.057	.057
1958	.050	.040	.047	.050	.050	.042	.050	.055	.058	.053	.050	.042
1959	.047	.040	.047	.063	.055	.042	.040	.044	.074	.070	.009	.051
1960	.050	.046	.042	.059	.050	.045	.050	.057	.052	.055	.051	.045
1961	.040	.050	.050	.059	.053	.053	.040	.050	.040	.040	.045	.056
1962	.040	.050	.048	.040	.050	.048	.045	.043	.040	.040	.040	.040
1963	.030	.040	.036	.038	.036	.046	.040	.046	.057	.040	.050	.033

[a] Underwriter spread is the difference between the yield to maturity calculated from the offering price and the yield to maturity calculated from the price at which the issue was sold to the underwriter.

TABLE M_{10}. Difference Between Average Coupon on Newly Issued Moody Aa Corporates and Average Coupon on Seasoned Moody Aa Corporates

	January	February	March	April	May	June	July	August	September	October	November	December
1952	.33	.25	.42	.31	.33	.26	.17	—	—	.35	.31	.24
1953	.43	.47	.46	.66	.92	—	.69	.52	.70	.14	.27	.27
1954	.22	−.05	−.14	−.04	.03	−.11	—	.02	.02	−.01	.08	.03
1955	.10	.14	.20	—	.20	.14	—	.50	.25	.23	.10	.29
1956	—	.10	.19	.60	.54	.48	.57	.92	.96	.96	1.21	1.21
1957	1.245	1.12	1.18	1.18	1.31	1.71	1.54	1.78	1.57	1.59	1.46	1.11
1958	.45	.67	.85	.57	.59	.57	.85	1.29	1.09	.995	1.045	.96
1959	1.14	.795	.89	.94	1.33	1.37	1.29	1.25	1.855	1.54	1.58	1.58
1960	1.265	1.30	1.09	1.255	1.255	1.13	.86	.61	.92	.84	.98	1.19
1961	.815	—	.69	.94	.865	1.065	.94	.975	.60	.64	.64	.85
1962	.725	.66	.56	.475	.40	.305	.475	.44	.35	.285	.285	.305
1963	.12	.305	.24	.35	.35	.28	.26	.215	.245	.325	.345	.455

TABLE M_{10a}. Average Coupon Rate on Newly Issued Moody Aa Corporates

	January	February	March	April	May	June	July	August	September	October	November	December
1952	3.2083	3.125	3.300	3.189	3.214	3.281	3.1875	–	–	3.250	3.208	3.1875
1953	3.375	3.416	3.458	3.656	3.916	–	3.750	3.625	3.8125	3.250	3.375	3.375
1954	3.333	3.062	2.968	3.083	3.145	3.000	–	3.125	3.125	3.100	3.1875	3.125
1955	3.2083	3.250	3.3125	–	3.312	3.250	–	3.625	3.375	3.375	3.250	3.4375
1956	–	3.250	3.343	3.750	3.687	3.625	3.718	4.083	4.125	4.125	4.375	4.375
1957	4.4375	4.312	4.375	4.375	4.500	4.906	4.729	4.968	4.900	4.916	4.791	4.437
1958	3.775	4.000	4.187	3.900	3.925	3.906	4.187	4.625	4.625	4.575	4.625	4.541
1959	4.718	4.375	4.531	4.587	5.000	5.041	5.000	4.958	5.562	5.250	5.291	5.3125
1960	5.000	5.041	4.833	5.000	5.000	4.875	4.625	4.375	4.687	4.6875	4.825	5.000
1961	4.625	–	4.500	4.750	4.675	4.875	4.750	4.875	4.500	4.5416	4.5416	4.750
1962	4.625	4.5625	4.4583	4.375	4.300	4.333	4.500	4.470	4.375	4.3125	4.3125	4.375
1963	4.1875	4.375	4.3125	4.4166	4.4166	4.350	4.375	4.333	4.3625	4.4375	4.4583	4.5833

TABLE M_{10b}. Average Coupon on Seasoned Moody Aa Corporates

	January	February	March	April	May	June	July	August	September	October	November	December
1952	2.88	2.88	2.88	2.88	2.88	3.02	3.02	3.02	3.02	2.90	2.90	2.95
1953	2.95	2.95	3.00	3.00	3.00	3.06	3.06	3.11	3.11	3.11	3.11	3.11
1954	3.11	3.11	3.11	3.12	3.12	3.11	3.11	3.11	3.11	3.11	3.11	3.10
1955	3.11	3.11	3.11	3.11	3.11	3.11	3.11	3.13	3.13	3.15	3.15	3.15
1956	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.16	3.16	3.16	3.16	3.16
1957	3.19	3.19	3.19	3.19	3.19	3.19	3.19	3.19	3.33	3.33	3.33	3.33
1958	3.34	3.34	3.33	3.33	3.33	3.33	3.33	3.33	3.53	3.58	3.58	3.58
1959	3.58	3.58	3.64	3.64	3.67	3.67	3.71	3.71	3.71	3.71	3.71	3.735
1960	3.735	3.745	3.745	3.745	3.745	3.745	3.77	3.77	3.77	3.84	3.84	3.81
1961	3.81	3.81	3.81	3.81	3.81	3.81	3.81	3.90	3.90	3.90	3.90	3.90
1962	3.90	3.90	3.90	3.90	3.90	4.025	4.025	4.025	4.025	4.025	4.025	4.07
1963	4.07	4.07	4.07	4.07	4.07	4.07	4.12	4.12	4.12	4.12	4.12	4.13

TABLE M_{20}. Yield on Newly Issued Aa Corporates, Moody Series

	January	February	March	April	May	June	July	August	September	October	November	December
1951	2.82	2.85	2.95	3.16	3.10	3.46	–	3.01	–	3.16	3.29	3.25
1952	3.14	3.05	3.26	3.14	3.14	3.22	3.19	–	–	3.17	3.09	3.14
1953	3.24	3.39	3.40	3.59	3.88	–	3.68	3.625	3.85	3.20	3.28	3.30
1954	3.19	3.03	2.91	2.99	3.06	3.00	–	2.97	3.11	2.98	3.10	3.02
1955	3.14	3.14	3.28	–	3.24	3.20	–	3.50	3.32	3.25	3.23	3.32
1956	–	3.15	3.27	3.72	3.62	3.55	3.68	4.12	3.98	4.04	4.30	4.30
1957	4.36	4.26	4.30	4.29	4.42	4.88	4.69	4.89	4.79	4.91	4.69	4.43
1958	3.72	3.92	4.09	3.85	3.88	3.81	3.98	4.52	4.68	4.52	4.47	4.50
1959	4.59	4.35	4.40	4.59	4.88	4.98	4.93	4.93	5.48	5.12	5.21	5.16
1960	4.92	5.04	4.74	4.94	4.88	4.76	4.65	4.42	4.62	4.62	4.74	4.97
1961	4.52	–	4.37	4.56	4.56	4.72	4.65	4.72	4.50	4.45	4.48	4.56
1962	4.55	4.51	4.40	4.35	4.28	4.26	4.42	4.39	4.27	4.26	4.24	4.32
1963	4.20	4.27	4.26	4.37	4.34	4.31	4.35	4.33	4.35	4.39	4.41	4.49
1964	4.45	4.38	4.50	–	4.46	4.48	4.42	4.42	4.50	–	–	4.50
1965	–	4.43	4.51	4.47	4.51	4.59	4.59	4.70	4.71	4.65	4.73	4.92
1966	4.90	5.12	5.35	5.20	5.25	5.65	5.77	5.88	5.90	5.84	5.78	5.93
1967	5.39	5.26	5.45	5.43	5.72	5.89	5.96	6.18	6.09	6.40		

TABLE M_{21}. Yield on Seasoned Aa Corporates, Moody Series

	January	February	March	April	May	June	July	August	September	October	November	December
1952	3.05	3.01	3.03	3.01	3.00	3.03	3.04	3.06	3.07	3.08	3.06	3.05
1953	3.09	3.14	3.18	3.29	3.41	3.50	3.42	3.39	3.43	3.33	3.27	3.28
1954	3.22	3.12	3.03	3.00	3.03	3.06	3.04	3.03	3.04	3.04	3.04	3.04
1955	3.06	3.10	3.13	3.13	3.15	3.14	3.14	3.20	3.22	3.19	3.18	3.22
1956	3.19	3.16	3.18	3.30	3.34	3.35	3.39	3.50	3.63	3.69	3.76	3.85
1957	3.89	3.83	3.80	3.79	3.83	3.98	4.10	4.21	4.26	4.28	4.29	4.08
1958	3.81	3.77	3.78	3.78	3.78	3.78	3.83	3.98	4.20	4.21	4.21	4.18
1959	4.22	4.24	4.23	4.32	4.46	4.56	4.58	4.58	4.69	4.76	4.70	4.74
1960	4.77	4.71	4.62	4.58	4.61	4.60	4.56	4.44	4.41	4.44	4.47	4.50
1961	4.48	4.40	4.34	4.37	4.41	4.45	4.53	4.57	4.59	4.56	4.54	4.56
1962	4.55	4.56	4.53	4.49	4.43	4.44	4.49	4.49	4.46	4.41	4.40	4.38
1963	4.37	4.36	4.34	4.35	4.36	4.36	4.39	4.40	4.41	4.43	4.44	4.46
1964	4.49	4.46	4.47	4.49	4.50	4.51	4.50	4.49	4.48	4.50	4.49	4.50
1965	4.48	4.46	4.48	4.48	4.49	4.52	4.56	4.59	4.63	4.66	4.69	4.80
1966	4.83	4.90	5.05	5.10	5.10	5.16	5.25	5.38	5.58	5.55	5.46	5.48
1967	5.30	5.18	5.23	5.26	5.42	5.63	5.72	5.76	5.87	6.01		

TABLE M_{22}. Yield on Seasoned Aa Corporates of Current Coupon, Coupon Rate Equal to That on New Issues, Moody Series

	January	February	March	April	May	June	July	August	September	October	November	December
1952	3.09	3.05	3.12	3.03	3.04	3.10	3.06	–	–	3.14	3.12	3.04
1953	3.16	3.19	3.28	3.41	3.68	–	3.62	3.49	3.76	3.36	3.25	3.25
1954	3.21	3.12	2.99	3.00	3.05	3.02	–	3.03	3.05	3.04	3.05	3.04
1955	3.08	3.11	3.13	–	3.15	3.14	–	3.28	3.26	3.21	3.18	3.24
1956	–	3.15	3.21	3.32	3.43	3.43	3.47	3.66	3.86	4.00	3.92	4.03
1957	4.07	3.98	3.98	4.00	4.22	4.30	4.35	4.54	4.62	4.47	4.50	4.28
1958	3.77	3.82	3.93	3.87	3.88	3.80	3.93	4.26	4.38	4.40	4.37	4.38
1959	4.40	4.32	4.33	4.44	4.62	4.68	4.68	4.68	4.76	4.90	4.86	4.88
1960	4.86	4.80	4.82	4.82	4.80	4.80	4.76	4.42	4.63	4.80	4.82	4.79
1961	4.70	–	4.44	4.50	4.50	4.52	4.63	4.60	4.65	4.61	4.59	4.58
1962	4.53	4.54	4.51	4.41	4.38	4.29	4.40	4.37	4.27	4.28	4.27	4.25
1963	4.29	4.23	4.25	4.28	4.29	4.28	4.30	4.32	4.34	4.36	4.38	4.41

TABLE S_{60}. Ratio of Volume of Slow-Selling to Total New Aaa, Aa and A Public Utility Issues [a]

	January	February	March	April	May	June	July	August	September	October	November	December
1952	1.000	.000	1.000	.757	.809	.481	.524	1.000	1.000	.629	.298	1.000
1953	.429	.647	.519	.743	.772	.515	.482	.615	.717	.739	.909	.846
1954	.588	.395	.868	.868	.591	.859	.917	.954	.949	.169	1.000	.194
1955	.969	.828	.862	1.000	.933	1.000	.766	1.000	.082	1.000	.372	1.000
1956	.560	.000	.787	.793	.709	.931	.901	.275	.078	.571	.671	.833
1957	.467	.216	.764	.102	.737	.601	.279	.440	.288	.848	.962	.113
1958	.000	.772	.802	.794	.958	1.000	.941	.292	.677	.000	.685	.636
1959	1.000	.547	1.000	1.000	1.000	.386	.190	1.000	1.000	.000	.483	.110
1960	.746	.500	1.000	.791	.812	1.000	.813	1.000	1.000	.947	.950	.684
1961	.595	.655	.830	.769	.818	.598	.828	.411	1.000	.000	.799	.772
1962	.000	.778	.951	.731	1.000	.776	.758	.476	.586	1.000	.295	1.000
1963	.568	1.000	.477	.747	.781	.985	1.000	1.000	1.000	1.000	1.000	.636

[a] Ratio applies to month preceding the observation of yield spread being explained.