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Volume Author/Editor: Reuben A. Kessel

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Chapter Title: How Short- and Long-term Interest Rates Have Behaved Cyclically

Chapter Author: Reuben A. Kessel

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HOW SHORT- AND LONG-TERM INTEREST RATES HAVE BEHAVED CYCLICALLY

THE BEHAVIOR of the term structure of interest rates during business cycles can be summarized by:

1. Relative yields of short- and long-term securities at cycle peaks and troughs.
2. Variance in yields over the cycle as a function of term to maturity.
3. Average yields over the cycle as a function of term to maturity.
4. Correspondence of peaks and troughs in yields with business cycle peaks and troughs.

In the first part of this chapter, the behavior of the term structure of interest rates since the end of World War II is described. Then the yields on government securities during the period between the two world wars are examined. Finally, the cyclical variation and relative level of yields on long- and short-term non-governmental obligations since 1858 is reviewed.

Since the end of World War II, there have been pronounced specific cycles in interest-rate series. The peaks and troughs of these series have been closely associated with turning points in business conditions. For the first four complete business cycles following the war, intra-cyclical changes in interest rates were, on the average, 50 per cent greater than cycle-to-cycle changes. Although there was a strong trend upward in interest rates during this time, peak-to-trough and trough-to-peak changes in rates were large relative to secular changes (see Table 5).

Relative to secular trends, peak-to-trough changes in short maturities were especially large. From the trough in the earliest of

TABLE 5
CYCLICAL CHANGES IN YIELDS OF GOVERNMENT SECURITIES,
OCTOBER 1945-FEBRUARY 1961^a

Business Cycle			Absolute Values (per cent)			Changes	
			Trough	Peak	Trough	Trough to Peak	Peak to Trough
A. Three-month Treasury bills							
10/45	11/48	10/49	.38	1.12	1.05	.74	-.07
10/49	7/53	8/54	1.05	2.10	.88	1.05	-1.22
8/54	7/57	4/58	.88	3.59	1.16	2.71	-2.43
4/58	5/60	2/61	1.16	3.53	2.29	2.37	-1.24
B. Nine- to twelve-month governments							
10/45	11/48	10/49	.82	1.21	1.08	.39	-.13
10/49	7/53	8/54	1.08	2.40	.62	1.32	-1.78
8/54	7/57	4/58	.62	3.89	1.40	3.27	-2.49
4/58	5/60	2/61	1.40	4.32	2.79	2.92	-1.53
C. Three- to five-year governments							
10/45	11/48	10/49	1.15	1.67	1.36	.52	-.31
10/49	7/53	8/54	1.36	2.74	1.68	1.38	-1.06
8/54	7/57	4/58	1.68	3.95	2.41	2.27	-1.54
4/58	5/60	2/61	2.41	4.63	3.52	2.22	-1.11
D. Twenty-year governments							
10/45	11/48	10/49	2.07	2.42	2.20	.35	-.22
10/49	7/53	8/54	2.20	3.09	2.52	.89	-.57
8/54	7/57	4/58	2.52	3.62	3.11	1.10	-.51
4/58	5/60	2/61	3.11	4.24	3.77	1.13	-.47
Averages, Four Cycles, 1945-61							
Three-month Treasury bills						1.72	-1.24
Nine- to twelve-month governments						1.98	-1.48
Three- to five-year governments						1.60	-1.00
Twenty-year governments						.87	-.44

Source: Series are adjusted for seasonal variation by the National Bureau. All series, except the twenty-year government bond series, are compiled by the Federal Reserve Board and are reported monthly in the *Federal Reserve Bulletin*. The twenty-year government bond series is compiled by the Morgan Guaranty Trust Co.

^aDuring this time, there was a half cycle of experience with six-month Treasury bills. For this half cycle, May 1960 through February 1961, 182-day bills decreased from 3.58 to 2.60, a change of 98 basis points. (A basis point is equal to .01 per cent.)

The three-month bill series is, strictly speaking, not directly comparable with the other series. Yields of bills are discount yields based on a 360-day, and not the usual 365-day year. Hence, bill yields understate correct yields, and the true yield differentials between bills and other securities is less than the differences reported here. In general, the higher the absolute level of bill rates, the greater the bias. For bill yields of 2.5 to 3 per cent, the bias is around eight basis points.

these four cycles to the trough in the latest, a period of more than fifteen years, interest-rate changes for bills and nine- to twelve-month governments were less than the trough-to-peak changes in the two latest cycles.

Since the trough-to-peak increases in short-term rates were greater than the corresponding increases in long-term rates, the former rose relative to the latter during expansions. Conversely, short-term rates fell relatively during contractions, since their peak-to-trough decreases were greater. Consequently, short-term rates were relatively high about cyclical peaks and low about troughs.

The relative changes in short- and long-term yields over the cycle imply systematic changes in yield differentials or spreads between maturity classes. Since short-term rates were typically below long-term rates, spreads between them narrowed during the course of an expansion and widened during a contraction. Absolute differences became smaller when rates increased and larger when rates decreased. For the three latest cycles (1949-61), an absolute increase in bill yields of one-hundred basis points was associated with an average decrease in the spread between bills and twenty-year government bonds of forty-three basis points.¹

This evidence also indicates that short-term rates were more variable absolutely over the cycle (see Table 6). However, the general belief that the longer the term to maturity, the less volatile the yield, is not entirely supported. In each of the three latest cycles, nine- to twelve-month governments were more variable absolutely than three-month Treasury bills. This suggests that the absolute variability in yields over the cycle first increased and then decreased with the term to maturity.

In contrast to the spreads between bills and long-term governments, the yield differential between bills and nine- to twelve-month governments widened over the course of the post-World War II expansions and narrowed during the contractions. For the three latest cycles, an absolute increase of 1 per cent in the yields of bills was associated with an average increase of eighteen basis points in the differential.

¹ The slope of the regression equation relating the absolute size of the yield differential between bills and bonds to the absolute level of bill yields was .43.

TABLE 6

VARIATION IN YIELDS OF GOVERNMENT SECURITIES DURING FOUR BUSINESS CYCLES,
OCTOBER 1945-FEBRUARY 1961

Business Cycle, Trough to Trough	Three-Month Bills	Nine- to Twelve-Month Governments	Three- to Five-Year Governments	Twenty-Year Governments
Standard deviation				
10/45 to 10/49	.334	.159	.197	.163
10/49 to 8/54	.375	.434	.405	.259
8/54 to 4/58	.817	.886	.605	.311
4/58 to 2/61	.874	1.031	.698	.321
Coefficient of variation ^a				
10/45 to 10/49	44.59	16.19	14.43	7.40
10/49 to 8/54	25.41	27.45	20.51	10.04
8/54 to 4/58	35.58	35.44	20.78	10.10
4/58 to 2/61	31.87	30.72	18.15	8.22

^aStandard deviation stated as a percentage of the mean.

TABLE 7

AVERAGE YIELD OF GOVERNMENT SECURITIES DURING FOUR BUSINESS CYCLES,
OCTOBER 1945-FEBRUARY 1961
(per cent)

Business Cycle, Trough to Trough	Three-Month Bills	Nine- to Twelve-Month Governments	Three- to Five-Year Governments	Twenty-Year Governments
10/45 to 10/49	.749	.982	1.365	2.203
10/49 to 8/54	1.476	1.581	1.975	2.580
8/54 to 4/58	2.296	2.500	2.912	3.079
4/58 to 2/61	2.742	3.356	3.846	3.904
Unweighted average of the cycle averages				
10/45 to 2/61	1.816	2.105	2.524	2.942

Unlike the variability in yields over the cycle, average yields varied monotonically with term to maturity (see Table 7). The longer the term to maturity, the higher the yield. This suggests that yield curves were, on the average, positively sloped during the four 1945-61 cycles.² Slopes were invariably positive from the end

TABLE 8

TIMING OF SHORT- AND LONG-TERM YIELDS OF GOVERNMENT SECURITIES
AT BUSINESS CYCLE PEAKS AND TROUGHS,
OCTOBER 1945-FEBRUARY 1961

	Lead (-) or Lag (+) in Months, at Business Cycle Peaks and Troughs								
	10/45 T	11/48 P	10/49 T	7/53 P	8/54 T	7/57 P	4/58 T	5/60 P	2/61 T
1. Three-month bills	a	a	a	-1	-2	-1	+2	-5	-2
2. Nine- to twelve-month governments	a	+4	-3	-1	0	0	+2	-4	-1
3. Three- to five-year governments	+5	-3	-3	-1	0	0	+2	-5	-5
4. Twenty-year governments	+4	-1	+2	-1	0	-1	0	-4	-5

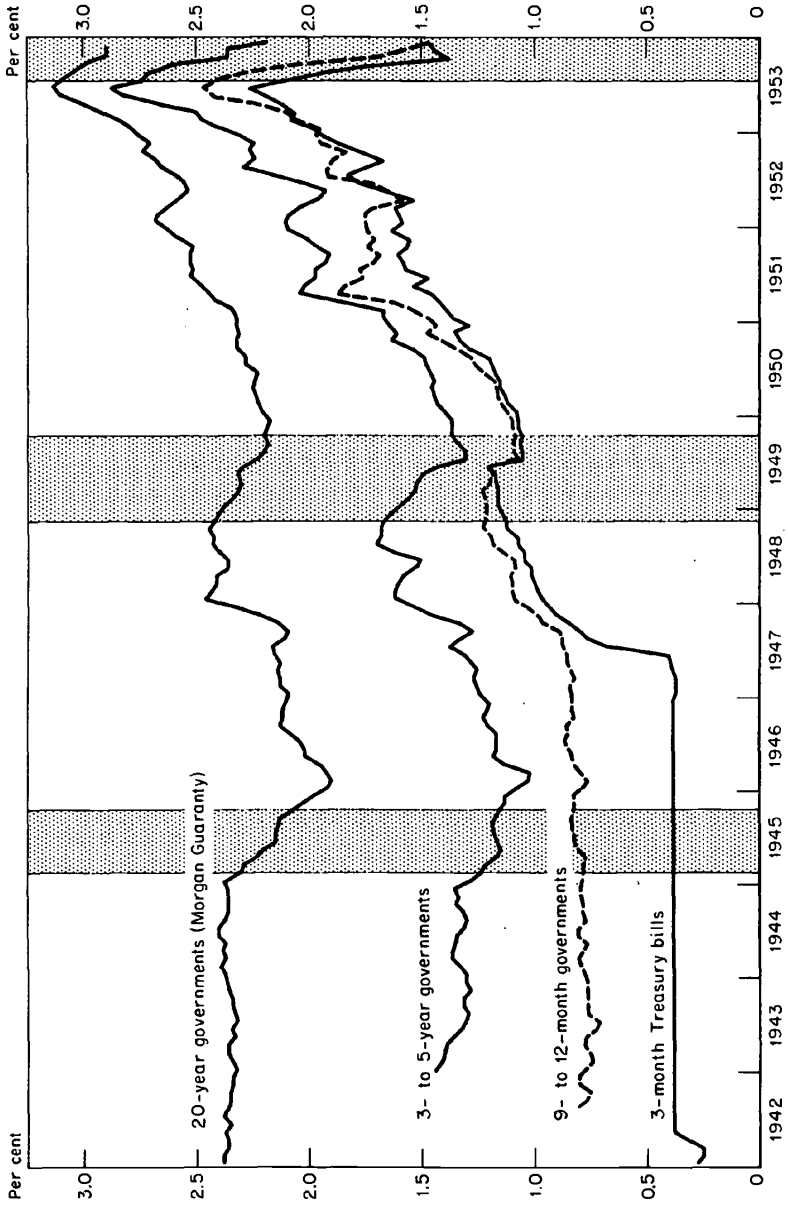
^aNo specific cycle.

of the war through 1955, but in more recent years, curves with negatively sloped segments have been observed.

In general, the steepness or the degree to which yield curves were positively inclined decreased from trough-to-peak. Only about peaks could one observe yield curves with negative slopes (see Table 5 and Charts 5 and 6). Negatively sloped yield curves, or more

² Yield curves depict, at one point in time, average rates of interest as a function of term to maturity. They portray the average yield of securities that are homogeneous with respect to credit-worthiness and vary only in term to maturity. Marginal rate of interest curves bear the same relation to yield curves that marginal cost curves bear to average cost curves. These show marginal rates of interest as a function of term to maturity and are implied by yield curves. A one-to-one correspondence exists between points on marginal rate of interest curves and yield curves. Marginal rate of interest curves are usually referred to as forward rates; they are the incremental or marginal costs of borrowing for two years instead of one year, etc. The marginal cost of extending a one-year maturity for an additional year is the forward rate for one-year money one year hence. Estimates of current yield curves for government securities are reported monthly in the *Treasury Bulletin*.

CHART 5
Yields of U.S. Government Securities, 1942-53



NOTE: Shaded areas represent business cycle contractions; unshaded areas, expansions.

correctly yield curves with negatively sloped segments, occurred about the 1957 and 1960 cyclical peaks.

During the 1945-61 business cycles, the peaks and troughs in the specific cycles of governments were roughly synchronous with those in business activity. For bills, the degree of synchronization is poorest for the earliest cycle and roughly on a par with longer-term governments for the three later cycles (see Table 8, and Charts 5 and 6). The striking coincidence of timing in specific and business cycles suggests that the forces that determine the peaks and troughs of business cycles must also play a role in determining those in the specific cycles of time series of government obligations.³

Seasonally adjusting the time series used had relatively little effect on the dating of specific cycle peaks and troughs. If anything the correspondence of specific with business cycle peaks was closer after adjustment (see Table 9).

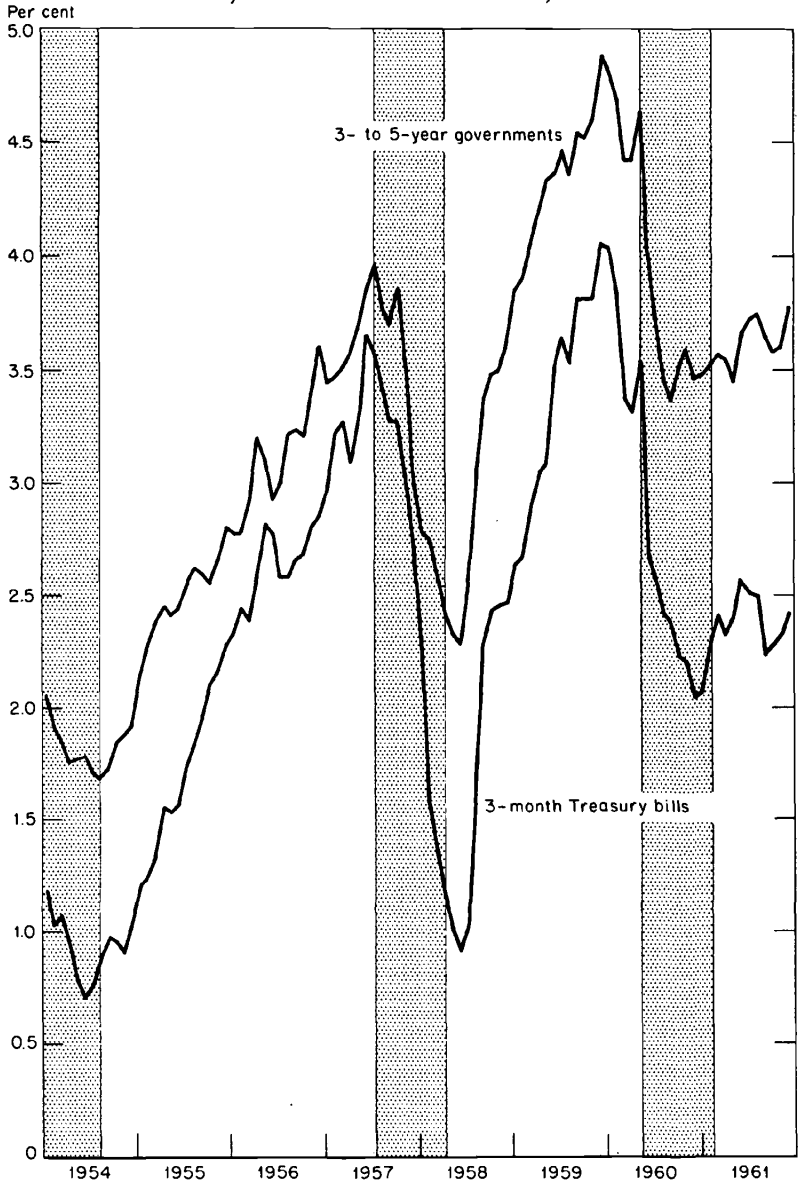
TABLE 9
TIMING OF PEAKS AND TROUGHS IN BILL RATES USING
SEASONALLY ADJUSTED AND UNADJUSTED DATA

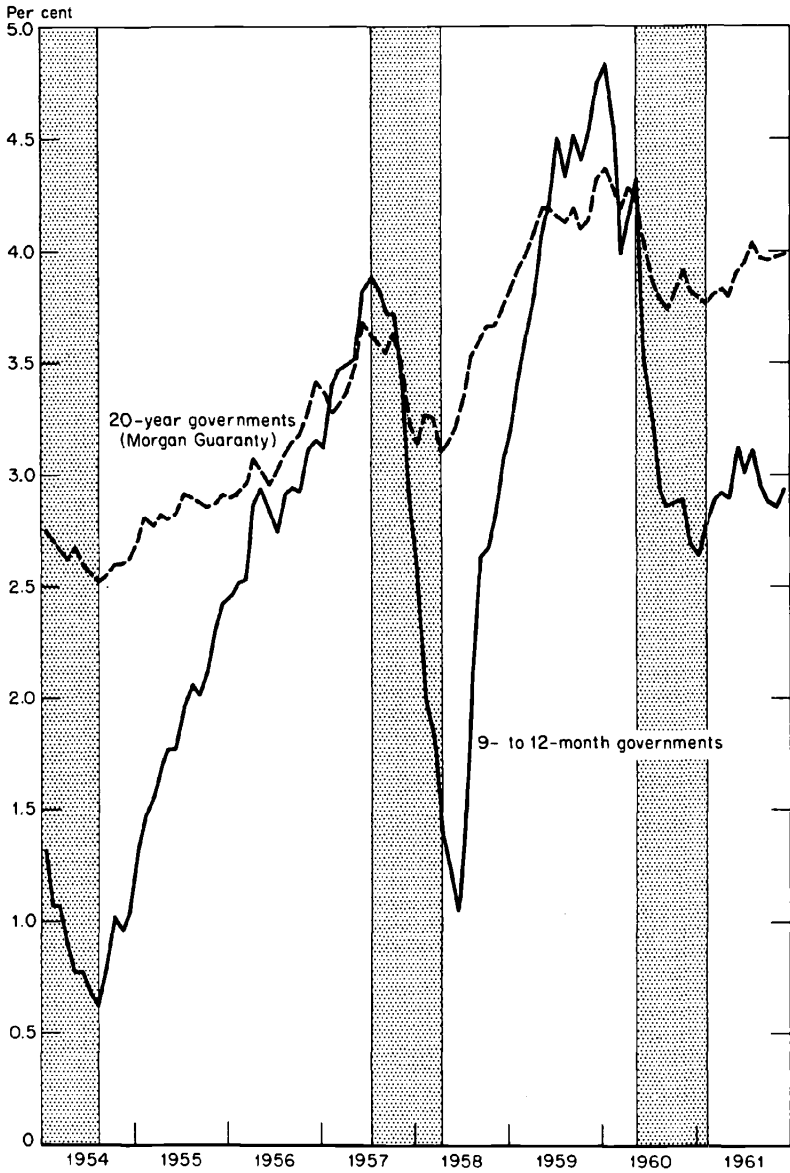
Bill Rates	Business Cycle Turns					
	P	T	P	T	P	T
Unadjusted						
Date of specific cycle turn	4/53	6/54	10/57	6/58	12/59	1/61
Lead (-) or lag (+) in months, relative to business cycle turn	-3	-2	+3	+2	-5	-1
Adjusted						
Date of specific cycle turn	6/53	6/54	6/57	6/58	12/59	12/60
Lead (-) or lag (+) in months, relative to business cycle turn	-1	-2	-1	+2	-5	-2

The time series upon which these uniformities in the cyclical behavior of interest rates are based appear in Charts 5 and 6. These time series unfortunately do not go back before World War II. In the 1920's and 1930's, the interest on virtually all of the long-term governments outstanding was partially tax exempt, and on short-term governments wholly tax exempt. The issuance of Treas-

³ Of the thirty-two specific cycle turning points, nineteen preceded the corresponding business cycle turning point, seven succeeded, and six were coincidental. On average, specific cycle turning points led by 0.9 months. At peaks, the average lead was 1.6 months; at troughs, 0.3 months.

CHART 6

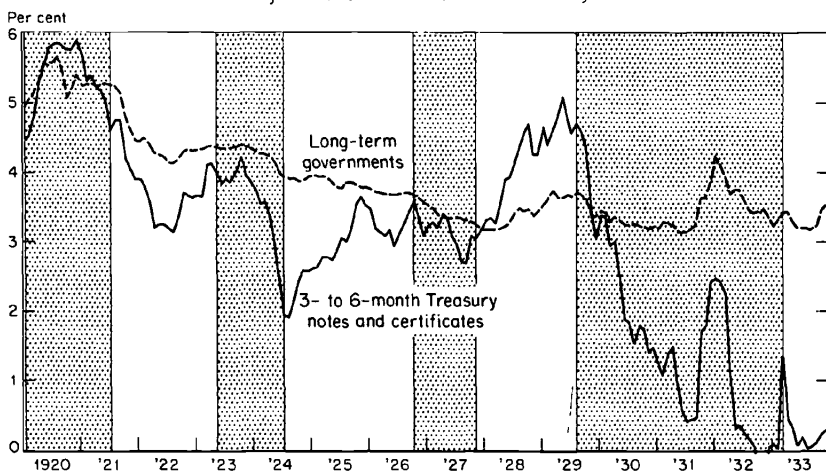
Yields of U.S. Government Securities, 1954-61



NOTE: Shaded areas represent business cycle contractions; unshaded areas, expansions.

ury bills began in December 1929, but offerings in the following two years were so infrequent and irregular that a continuous series does not begin until 1931. Before 1931, yields on short-term governments could be measured by a series on three- to six-month Treasury notes and certificates that began in 1920 and ended in 1933. The income derived from holding these notes and certificates was fully tax exempt. In summary, prewar data that depict the relative yields of short- and long-term governments over the cycle are not directly comparable to postwar data, and the short-term data for

CHART 7
Yields of U.S. Government Securities, 1920-33



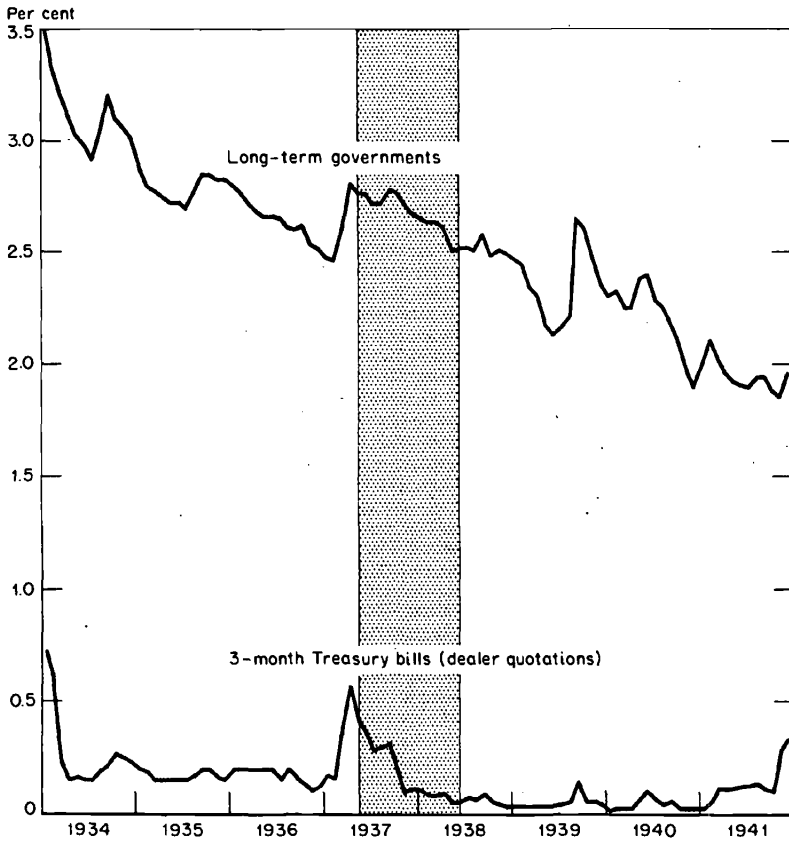
NOTE: Shaded areas represent business cycle contractions; unshaded areas, expansions.

the 1920's are not directly comparable to those of the 1930's. Despite these limitations, this body of data constitutes an important and fruitful source of knowledge. It can reveal how the yields of short- and long-term securities varied cyclically, and the extent to which specific and reference cycles coincided.

Between 1920 and 1933, there were two subperiods when the rate of interest for three- to six-month Treasury notes and certificates was higher than the rate on long-term governments. These were from June of 1920 through March of 1921, and from January 1928 through November 1929. For the balance of this period, short-term

government yields were always below long-term yields. The 1920-21 reversal of the usual relationship was both shorter and less pronounced than the later reversal. The maximum yield differential during the 1920-21 reversal was sixty-seven basis points; the average

CHART 8
Yields of U.S. Government Securities, 1934-41



NOTE: Shaded areas represent business cycle contractions; unshaded areas, expansions.

differential was thirty-three basis points. For the later period, 1928-29, the maximum differential was 145 basis points; the average was ninety-one. For nine months in 1957 and eight months in 1959 and 1960, nine- to twelve-month government yields were above the

TABLE 10
CYCLICAL CHANGES IN YIELDS OF GOVERNMENT SECURITIES,
1921-45

	Business Cycles			Absolute Values			Changes	
							Trough	Peak
	Trough	Peak	Trough	Trough	Peak	Trough	Trough	Peak to Trough
A. Long-term governments ^a				5.26	4.37	3.94	-0.89	-0.43
July 1921-May 1923-July 1924				3.94	3.68	3.23	-0.26	-0.45
Nov. 1927-Aug. 1929-Mar. 1933				3.23	3.71	3.42	.48	-0.29
Mar. 1933-May 1937-June 1938				3.42	2.80	2.58	-0.62	-0.22
June 1938-Feb. 1945-Oct. 1945				2.58	2.38	2.35	-0.20	-0.03
B. Short-term governments ^b								
July 1921-May 1923-July 1924				4.60	3.95	1.92	-0.65	-2.03
July 1926-Oct. 1926-Nov. 1927				1.92	3.58	3.04	1.66	-0.54
Nov. 1927-Aug. 1929-Mar. 1933				3.04	4.70	1.34	1.66	-3.36
Mar. 1933-May 1937-June 1938				2.29	.65	.02	-1.64	-0.63
June 1938-Feb. 1945-Oct. 1945				.05	.38	.38	.33	0

^aFirst Three Cycles: Board of Governors of the Federal Reserve System, *Banking and Monetary Statistics*, Washington, D.C., 1943, Table 128, p. 468.

Last Two Cycles: Federal Reserve Board bill dealer quotations series (average yields on all outstanding fully taxable bonds due or callable after 12 years for March 1933 and after 15 years for May 1937, June 1938, Feb. 1945, and Oct. 1945).

^bFirst Three Cycles: Three- to six-month Treasury notes and certificates, *Banking and Monetary Statistics*, Table 122, p. 460.

Fourth Cycle: Treasury bill new issues, *Banking and Monetary Statistics*, Table 122, p. 460.

Fifth Cycle: Three-month Treasury bill dealer quotations series from the *Federal Reserve Bulletin*.

TABLE 11
AVERAGE YIELD AND STANDARD DEVIATION IN YIELDS OF GOVERNMENT
SECURITIES DURING FIVE BUSINESS CYCLES,
1921-45

Business Cycle, Trough to Trough	Long-Term Governments		Short-Term Governments	
	Average Yield	Standard Deviation	Average Yield	Standard Deviation
June 1921-July 1924	4.39	.29	3.71	.56
July 1924-Nov. 1927	3.68	.23	3.04	.42
Nov. 1927-March 1933	3.44	.24	2.44	1.63
March 1933-June 1938	2.89	.26	.26	.32
June 1938-Oct. 1945	2.36	.18	.22	.16

Source: See Table 10.

twenty-year bond rate. The maximum differential in 1959-60 was twice that in 1957; seventy-eight basis points compared with thirty-eight (see Charts 6 and 7).

For the prewar cycles, the trough-to-peak and peak-to-trough movements in short-term rates were typically greater than the movements in long-term rates (see Table 10). In this respect, the cyclical behavior of interest rates before and after World War II are similar. Only for the wartime cycle, 1938-45, when the Treasury bill rate was constant for long periods as a result of the government support program, is the variation in the long-term rate greater than in the short-term rate. This seems to be directly attributable to the pegging of the rate on three-month bills by the government.

TABLE 12
TIMING OF SHORT- AND LONG-TERM YIELDS OF GOVERNMENT
SECURITIES AT BUSINESS CYCLE PEAKS AND TROUGHS,
1921-45

		Lead(-) or Lag(+) in Months, at Business Cycle Peaks and Troughs									
Government Securities	7/21 T	5/23 P	7/24 T	10/26 P	11/27 T	8/29 P	3/33 T	5/37 P	6/38 T	2/45 P	10/45 T
Short-term	+13	+5	+1	-11	-2	-3	-4	-1	+19	a	a
Long-term	+13	+5	a	a	+4	-5	+47	+5	+40	-7	+6

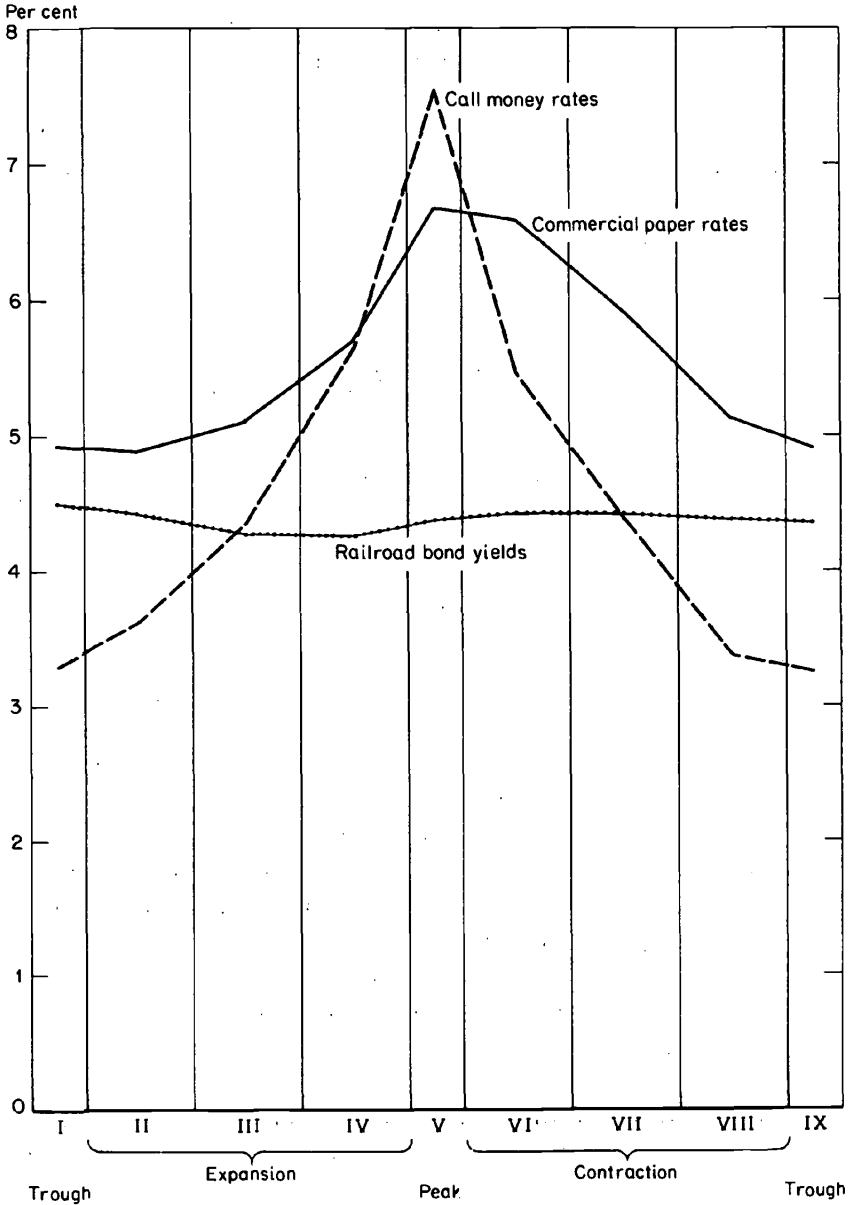
^aNo specific cycle.

For each of the five prewar cycles shown in Table 11, short-term government yields were, on average, below long-term yields (see Table 11). Hence, for each of the nine complete cycles in the 1921-61 period for which yields of long- and short-term governments are currently available, yield curves for governments probably had a positive slope, on the average. Similarly, the yield variance of short-term governments, with the exception of the wartime cycle, was greater than that of long-term governments.

The association of specific with business cycle turning points is stronger for the postwar cycles than for the five cycles from 1921 to 1945 (see Table 12). Between 1921 and 1945, unlike the later period, there are turning points of interest rate cycles whose association with business cycle peaks and troughs is tenuous at best. In the

CHART 9

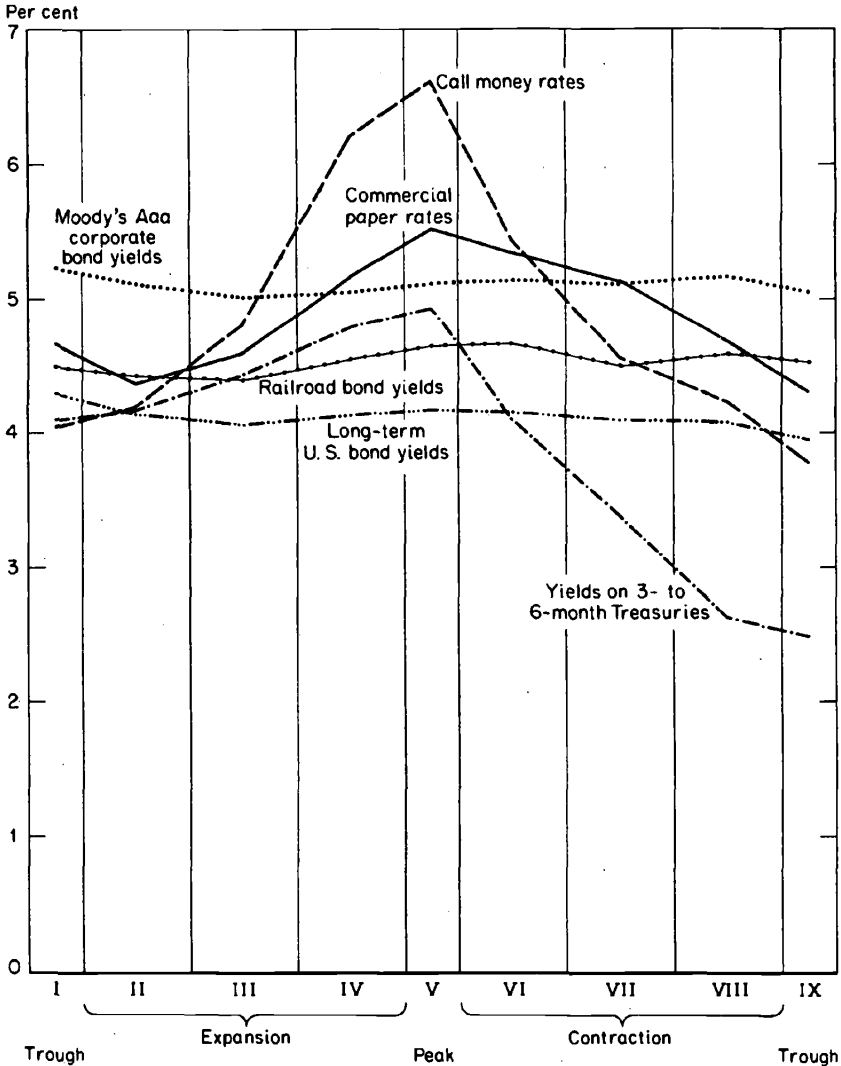
Average Pattern of Long-Term and Short-Term Interest Rates in the United States During Fourteen Business Cycles, 1858-1914



SOURCE: See notes following Chart 12.

CHART 10

Average Pattern of Long-Term and Short-Term Interest Rates in the United States During Five Business Cycles, 1914-33



SOURCE: See notes following Chart 12.

NOTE: The following series cover shorter periods: long-term U.S. bonds yields and Moody's Aaa corporate bond yields, four cycles, 1919-33; yields on three- to six-month Treasury notes and certificates, three cycles, 1921-33.

1930's and early 1940's, specific cycles are less well defined than they were during either the 1920's or the post-World War II era. Nevertheless, the generalization that the gap between long- and short-term rates is small when rates are high and large when rates are low still seems to be supported by the data (see Charts 7 and 8).

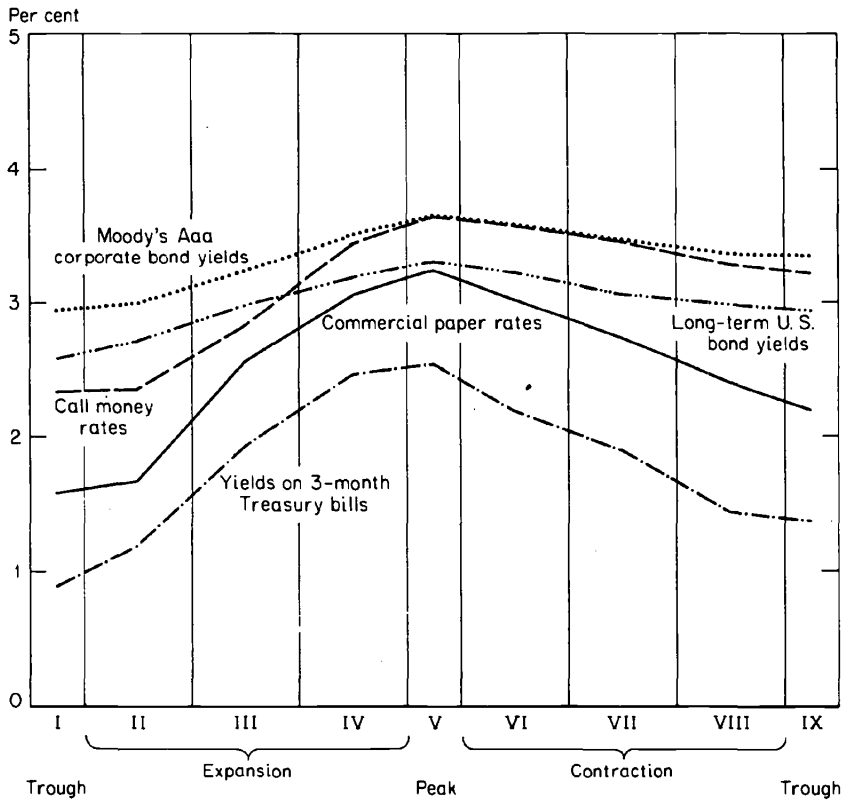
Yields of nongovernmental obligations can provide insights into the cyclical behavior of interest rates before World War I. Since the issuers of long maturities are not the same as the issuers of short maturities, one hesitates to use these data for comparing the yields on different maturities. The series appear to be more useful for examining the cyclical changes in relative yields. Chart 9 summarizes these data from about the beginning of the Civil War until World War I. For the fourteen cycles in this period, short-term rates rose relative to long-term rates during expansions and fell during contractions. The peaks in the long-term rate occurred about midway in the business contraction, and the troughs occurred about midway in the expansion. The same data are carried forward from 1914 through 1933 in Chart 10. Again, short-term rates rose relative to long-term rates during expansions and fell during contractions. In this period, the peaks in the long-term rate more nearly matched business peaks, although troughs continued to occur after those in business. The same implications for the relative movements of long- and short-term rates during the business cycle may be drawn from these series for the 1945-61 period (see Chart 11). Only for 1933 through 1945, when the yields of governments also behaved anomalously, is the pattern—the relative rise of short-term rates during expansions and their fall during contractions—broken⁴ (see Chart 12). This is a period when specific cycles conformed least with peaks and troughs in business conditions.

An independent body of data that reflects the term structure of interest rates from 1900 to date was initiated by Durand and sub-

⁴ Hicks reports that short-term rates averaged less than long-term rates in England from 1850 through 1930. He uses risk premiums as the explanation for the observed yield differential. See John R. Hicks, "Mr. Hawtrey on Bank Rates and the Long Term Rate of Interest," *The Manchester School of Economic and Social Studies*, October 1939, p. 28.

Hawtrey reports that interest rates have varied cyclically in England, with short-term rates relatively low during depressions and high during booms. See Ralph G. Hawtrey, *A Century of Bank Rates*, London, 1938, pp. 167 ff.

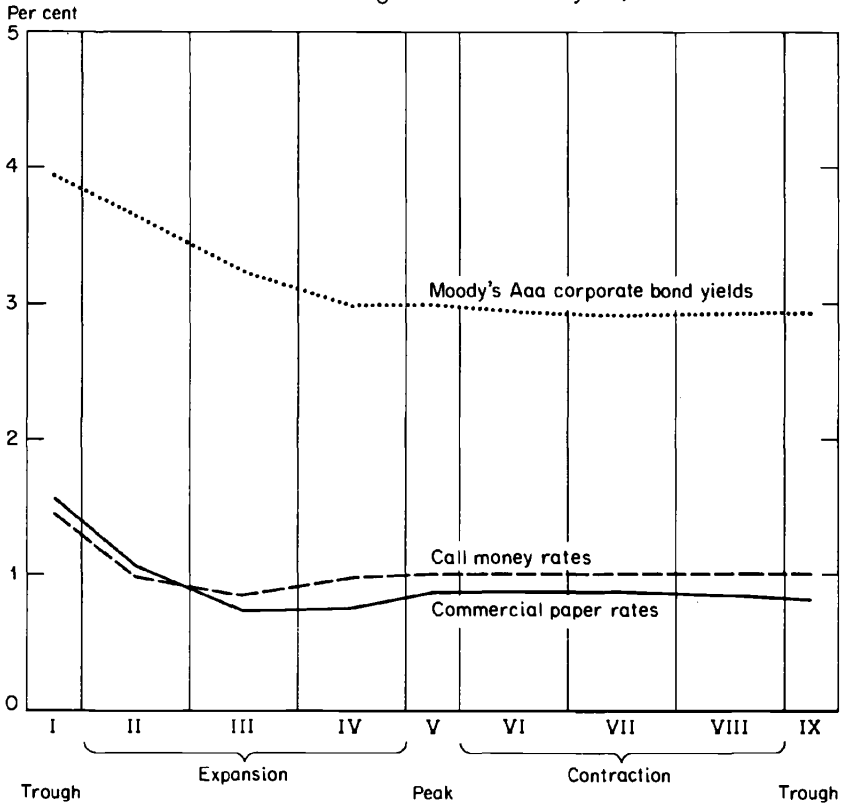
CHART 11
Average Pattern of Long-Term and Short-Term Interest Rates in the United States During Four Business Cycles, 1945-61



SOURCE: See notes following Chart 12.

CHART 12

Average Pattern of Long-Term and Short-Term Interest Rates in the United States During Two Business Cycles, 1933-45



SOURCE TO CHARTS 9 THROUGH 12

Call money rates

1858-1936: Frederick R. Macaulay, *Some Theoretical Problems Suggested by the Movements of Interest Rates, Bond Yields and Stock Prices in the United States since 1856*, New York, NBER, 1938, Appendix A.

1937-61: *Survey of Current Business*, U.S. Department of Commerce.

Commercial paper rates

1858-Jan. 1937: Macaulay, *Movements of Interest Rates*.

Feb. 1937-61: Compiled by NBER from weekly rates in *Bank and Quotation Record*, William B. Dana Co.

Railroad bond yields

Macaulay, *Movements of Interest Rates*. The series used is adjusted for "economic drift."

Moody's Aaa, corporate bond yields

Moody's Industrial Manual, Moody's Investors' Service

Long-term U.S. bond yields

Federal Reserve Bulletin, Board of Governors of the Federal Reserve System

TABLE 13
 BASIC YIELDS ON CORPORATE BONDS DURING BUSINESS CYCLES,
 1900-61
 (per cent)

Business Cycle (fiscal years)			Term to Maturity (years)	Yield at Business Cycle			Change in Yield		Cycle Average ^a
				Trough (T)	Peak (P)	Trough (T)	Trough to Peak	Peak to Trough	
1901	1903	1904	1	3.25	3.45	3.60	+20	+15	3.39
			5	3.25	3.45	3.60	+20	+15	3.39
			20	3.25	3.45	3.60	+20	+15	3.39
1904	1907	1908	1	3.60	4.87	5.10	+1.27	+23	4.37
			5	3.60	3.87	4.30	+27	+43	3.75
			20	3.60	3.80	3.95	+20	+15	3.66
1908	1910	1911	1	5.10	4.25	4.09	-.85	-.16	4.29
			5	4.30	4.10	4.05	-.20	-.05	4.08
			20	3.95	3.87	3.94	-.08	+07	3.88
1911	1913	1915	1	4.09	4.74	4.47	+65	-.27	4.42
			5	4.05	4.31	4.39	+26	+08	4.24
			20	3.94	4.02	4.20	+08	+18	4.04
1915	1918	1919	1	4.47	5.48	5.58	+1.01	+10	4.51
			5	4.39	5.25	5.16	+86	-.09	4.53
			20	4.20	4.82	4.81	+62	-.01	4.36
1919	1920	1922	1	5.58	6.11	5.31	+53	-.80	6.16
			5	5.16	5.72	5.19	+56	-.53	5.70
			20	4.81	5.17	4.85	+36	-.32	5.10
1922	1923	1924	1	5.31	5.01	5.02	-.30	+01	5.09
			5	5.19	4.90	4.90	-.29	0	4.97
			20	4.85	4.68	4.69	-.17	+01	4.72
1924	1927	1928	1	5.02	4.30	4.05	-.72	-.25	4.27
			5	4.90	4.30	4.05	-.60	-.25	4.41
			20	4.69	4.30	4.05	-.39	-.25	4.39
1928	1929	1933	1	4.05	5.27	2.60	+1.22	-2.67	4.01
			5	4.05	4.72	3.68	+67	-1.04	4.29
			20	4.05	4.45	4.11	+40	-.34	4.35
1933	1937	1939	1	2.60	.69	.57	-1.91	-.12	1.23
			5	3.68	1.68	1.55	-2.00	-.13	2.33
			20	4.11	2.90	2.65	-1.21	-.25	3.25
1939	1945	1946	1	.57	1.02	.86	+45	-.16	0.80
			5	1.55	1.53	1.32	-.02	-.21	1.46
			20	2.65	2.55	2.35	-.10	-.20	2.56

(continued)

TABLE 13 (concluded)

Business Cycle (fiscal years)			Term to Maturity (years)	Yield at Business Cycle			Change in Yield		
				Trough (T)	Peak (P)	Trough (T)	Trough to Peak	Peak to Trough	Cycle Average ^a
1946	1948	1950	1	.86	1.60	1.42	+ .74	- .18	1.35
			5	1.32	2.03	1.90	+ .71	- .13	1.80
			20	2.35	2.73	2.48	+ .38	- .25	2.54
1950	1953	1954	1	1.42	2.62	2.40	+1.20	- .22	2.33
			5	1.90	2.75	2.52	+ .85	- .23	2.48
			20	2.48	3.05	2.88	+ .57	- .17	2.80
1954	1957	1958	1	2.40	3.50	3.21	+1.10	- .29	2.90
			5	2.52	3.50	3.25	+ .98	- .25	2.97
			20	2.88	3.50	3.47	+ .62	- .03	3.15
1958	1960	1961	1	3.21	4.95	3.10	+1.74	-1.85	3.92
			5	3.25	4.73	3.75	+1.48	- .98	4.01
			20	3.47	4.55	4.12	+1.08	- .43	4.15

Source: 1900-42, David Durand, *Basic Yields of Corporate Bonds, 1900-1942* New York, NBER, Technical Paper 3, 1942, pp. 5-6.

1943-47, David Durand and Willis J. Winn, *Basic Yields of Bonds, 1926-1947: Their Measurement and Pattern*, New York, NBER, Technical Paper 6, 1947, p. 14.

1948-61, National Industrial Conference Board, *The Economic Almanac 1962*, p. 353.

The business cycle peak and trough dates are from the National Bureau's fiscal year chronology. The basic yields are available only for the first quarter of each calendar year; the yield for the first quarter of 1901 is entered in the fiscal year ended June 30, 1901, etc.

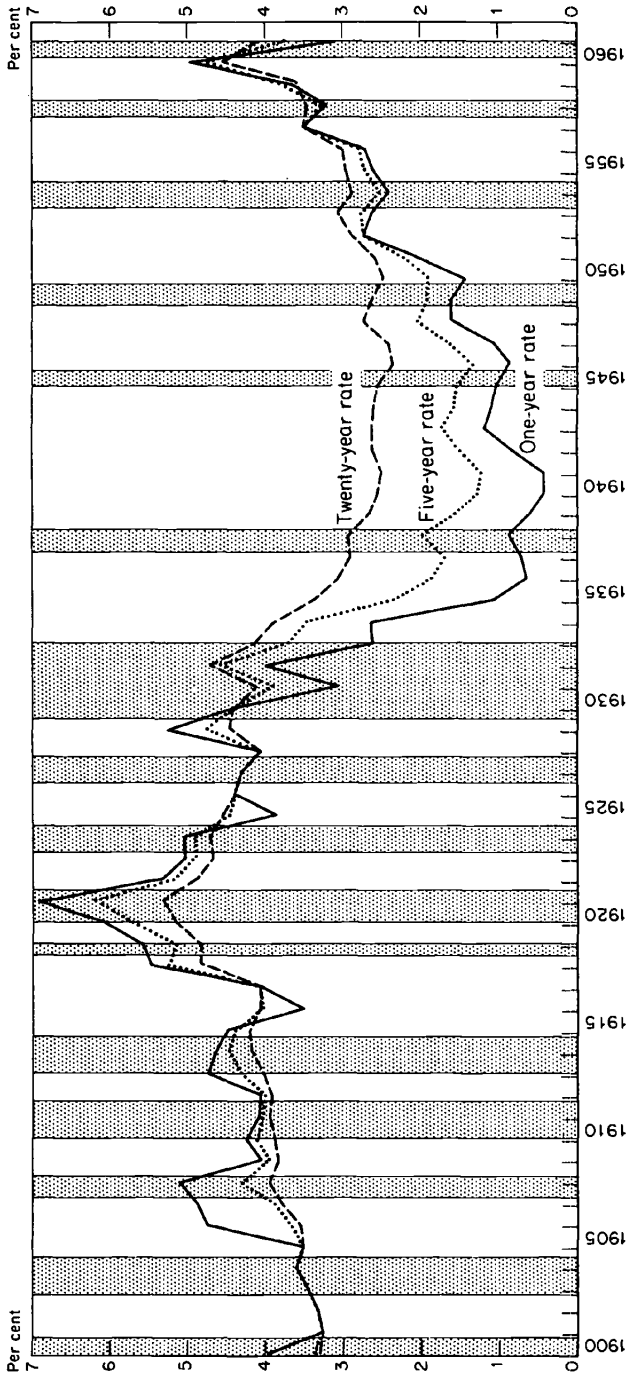
^aThe initial and terminal trough years each receive a weight of 1/2; the intervening years, a weight of 1.

sequently maintained by other observers. These data show yields as of the first quarter of every year for high-grade or default-free corporate bonds as a function of term to maturity. They were assembled by plotting yields of high-grade corporate bonds, fitting curves to the lower bounds of these data, and subsequently observing the points on these yield curves that correspond to particular terms to maturity. These data are summarized in Table 13 and Chart 13.

Durand's observations suggest that the swings in short-term rates are typically greater than the swings in long-term rates. When rates conformed to the business cycle, the term structure was less steeply inclined at peaks and troughs. During the early part of this period, conformity with the cycle was poorer than in the later part.

Durand's observations are consistent with the time series already

CHART 13
Basic Yields of Corporate Bonds, First Quarter, Durand Data, 1900-1961



Source: See source to Table 13.
 Note: Shaded areas represent business cycle contractions based on quarterly reference dates; unshaded areas, expansions.

presented, except for the 1920's. During this decade, time series for governments indicate that the average yields of short maturities were below that of long maturities. Durand's findings indicate just the opposite. Durand recognizes the existence of this inconsistency; indeed, for the same year he reports yield curves with opposite slopes but offers no explanation.⁵

⁵ Two possible lines of explanation, other than errors of observation, come to mind. (1) At this time, long governments were partially tax exempt, short governments totally tax exempt. (2) Transactions costs for short, relative to long, governments are lower than they are for short, relative to long, corporates.