3

The Behavior of Mortgage Yields and Bond Yields

Prior to 1961, mortgage yields had a more narrow cyclical amplitude than outstanding bond yields, and lagged bond yields at turning points. Chapter 3 attempts to explain why this happened. Also, an hypothesis is developed to explain the change in amplitude pattern during 1961–66, when changes in mortgage yields were unusually sharp.

Cyclical Amplitude

In an earlier study, Klaman noted that conventional mortgage interest rates have a smaller cyclical amplitude than bond yields.[1] The same observation had been made earlier by Grebler, Blank and Winnick.[2] Although Klaman's data were recorded on the disbursement date, which tends to dampen amplitude,[3] the point holds when mortgage yields are recorded on an authorization basis as well. As shown in Table 3-1, the change in conventional mortgage yields (measured in basis points) in each of six cyclical phases between 1949 and 1960 was smaller than the change in yields on United States government bonds, outstanding corporate bonds (both Aaa and Baa), and outstanding state and local bonds (both Aaa and Baa).[4] (In the most recent cycle, conventional mortgage-yield amplitude was comparable to that of bonds, but special factors were at work that will be discussed later.) Cyclical changes expressed in terms of percentage changes in yields

NOTE: An earlier, and shorter, version of this chapter and the one that follows appears as Jack M. Guttentag, "The Behavior of Residential Mortgages since 1951," in Jack M. Guttentag and Phillip Cagan (eds.), *Essays on Interest Rates*, Volume I, New York, NBER, 1969.

[1] Saul Klaman, *The Postwar Residential Mortgage Market*, NBER, 1961, pp. 75–78.

[2] Grebler, Blank and Winnick, *Capital Formation in Residential Real Estate: Trends and Prospects*, p. 223.

[3] When mortgage rates are recorded on the disbursement date, the recorded peak and trough values are actually averages of rates authorized during a number of months preceding the turning-point month.

[4] Newly issued bonds, not shown here, display even greater cyclical amplitude than outstanding bonds. See page 44.

TABLE 3-1

Changes in Yields During Specific Cycles, Selected Series
(basis points)

Period of Rise (R) or Decline (D)	Life Insurance Co. Mortgages – Authorization Basis		FHA Secondary Market	U.S. Gov't. Long-Term	Corporate		State and Local	
	Conventional (1)	FHA (2)	(3)	(4)	Aaa (5)	Baa (6)	Aaa (7)	Baa (8)
1949-51 D	-12[a]	-18[a]	-28	-26	-27	-37	-63	-97
1951-53 R	56	62	85	94	83	72	134	168
1954 D	-19	-11	-33	-66	-53	-43	-74	-73
1954-58 R	101	104	110	126	125	164	153	155
1958 D	-31	-16	-31	-61	-55	-56	-74	-78
1958-60 R	72	81	94	125	104	81	80	72
Average, 3 cycles	49	49	64	83	75	76	96	107
1960-65 D	-60	na	-85	-64	-42	-56	-60	-101
1965-66 R	105	na	156	106	130	140	104	106
Average, 1 cycle	83	na	121	85	86	98	82	104

Notes to Table 3-1

Note: Dates refer to years containing turning points in conventional mortgage series. Turning points in bond yields are based on series unadjusted for seasonal variation, and differ in some cases from those shown in Phillip Cagan, *Changes in the Cyclical Behavior of Interest Rates,* Occasional Paper 100, New York, NBER, 1966. Cyclical changes are measured between the peaks and troughs of each series. Averages are calculated without regard to sign.

[a]Data cover one company.

na=data not available

Source: Cols. 1 and 2, National Bureau of Economic Research compilations and Federal Home Loan Bank Board; col. 3, FHA; col. 4, Federal Reserve Board; cols. 5,6, 7 and 8, Moody's.

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would show even more marked differences in amplitude because of the higher absolute level of mortgage yields.[5]

Several possible explanations have been offered for the relatively narrow cyclical amplitude of mortgage interest rates. First, the data used by earlier investigators did not take into account fees and charges received or paid by lenders over the contract rate. Grebler, Blank and Winnick noted that "since the data show contract interest rates rather than yields on mortgages, they fail to reflect changes in premiums and discounts on mortgage loans, at times important in the mortgage market."[6] Furthermore, Avery Cohan points out what can be interpreted as an a priori argument for cyclical sensitivity in fees and charges. "Local institutions would feel less comfortable about raising rates than about raising fees and charges. Everybody knows what the going rate is on mortgages in any given area, but nobody knows anything about fees and charges."[7]

The new authorization series, which take into account fees and charges, do not bear out this supposition. On conventional loans, the inclusion of fees and charges has virtually no effect on cyclical amplitude. This is illustrated in Chart 3-1, which shows gross yield, contract rate, and the difference between them (the difference is on an enlarged scale). It is clear that virtually all cyclical variability in conventional yields stems from variability in contract rate.

Whether fees and charges are cyclically insensitive for lender groups other than life insurance companies is not clear. Federal Home Loan

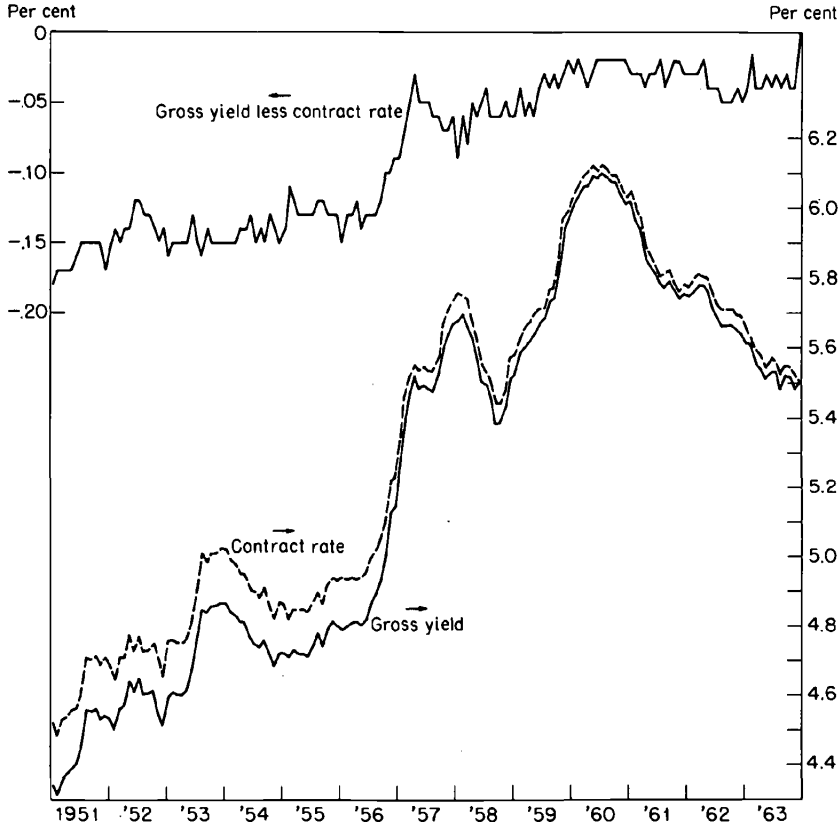
[5] The cyclical amplitude of mortgage yields may be affected slightly by the prepayment assumption used to calculate yield. See page 154.

[6] Grebler, Blank and Winnick, p. 223.

[7] Quoted from Cohan's comments on an earlier draft of this paper.

CHART 3-1

GROSS YIELD AND CONTRACT RATE ON CONVENTIONAL LOANS, 1951–63



Bank Board data covering the period of marked increase in rate between September–October 1965 and December 1966–January 1967 suggest that cyclical changes in fees and charges may be significant for savings and loan associations and perhaps commercial banks and mortgage companies. During that period, the average effective yield on new-home loans approved by savings and loan associations rose by about seventy-eight basis points, with an increase in fees and charges accounting for about twelve points and increase in contract rate for the balance. At commercial banks and mortgage companies, the rise in fees was the equivalent of yield increases of five basis points or less. At life

insurance companies and mutual savings banks fees and charges did not rise significantly. This evidence is hardly conclusive, however, since the data cover only one cyclical phase; furthermore, the Board's definition of fees and charges is not comprehensive.[8]

The popular notion that small changes in market conditions are better revealed in fees and charges on conventional loans than in contract rates seems to derive from the infinite divisibility of fees and charges; in contrast lenders almost invariably write contract rates in multiples of .25 per cent. Indivisibility does not, however, imply inflexibility in an aggregate, i.e., an average contract rate can rise .01 per cent when a small proportion of the mortgages in the aggregate, which previously had barely qualified for a 5.50 per cent rate, are jumped to 5.75 per cent, the others remaining unchanged.

Klaman suggests a second explanation for the relatively narrow cyclical amplitude of conventional mortgage yields.

> . . . the element of administrative costs . . . has its own place in the relative stickiness of mortgage rates. In general, the larger such costs are relative to the interest rate the more stable the interest rate is likely to be. The reason is simple: a minimum margin must be maintained between the interest rate and a lender's fixed administrative costs to assure him a reasonable return. . . . On residential loans, administrative costs of acquisition, servicing, and recordkeeping, perhaps 75 basis points compared to 10 on corporate securities, create a relatively stable state in residential mortgage interest rates.[9]

This argument is not convincing. Since mortgage rates at their lowest levels are several times higher than mortgage costs, how could these costs dampen rate variability? Even if there were such a rate-dampening mechanism, one would think that the extent of the rate-dampening effect would depend not on the absolute cost but on its size relative to the average rate level on that instrument. Viewed in this way, it is not at all clear that costs would have more of a dampening effect on mortgages than on bonds. The rate differential between mortgages and bonds (Baa and higher) is almost always greater than the sixty-five basis point cost differential.

A third explanation, also suggested by Klaman, is that adjustments

[8] In the Board's series, fees and charges cover only payments received by lenders, excluding payments made by lenders to third parties, such as "finders fees." In the Bureau series, fees paid are netted from fees received. It is possible that the fees paid by some lenders are cyclically sensitive.

[9] Klaman, p. 78.

in nonrate dimensions of the mortgage loan contract retard or offset rate adjustments.

> As we move away from standardized to more differentiated markets and commodities the number of variables, in addition to price, to be negotiated multiplies. The market for residential mortgages is an example of the most differentiated because few markets are characterized by more one-of-a-kind deals. The credit of each borrower must be established, and "credit worthiness" becomes a function of the relative tightness of capital markets. Numerous contract terms other than price are subject to individual negotiation-down-payment requirements, amortization provisions, contract maturities, prepayment penalties and non-interest costs. The nature and location of the particular residential unit securing the mortgage, moreover, are important factors in a mortgage transaction.
>
> All these elements are more sensitive than the mortgage interest rate is to changes in financial market conditions. Down-payment and maturity provisions are particularly responsive. . . .[10]

This argument is illustrated in the upper panel of Figure 3-1. If the aggregate yield series constitutes a weighted average of components *A* (high-yield) and *B* (low-yield), and the mix shifts toward *B* when yields rise and toward *A* when they fall, cyclical variability in the aggregate will be dampened.

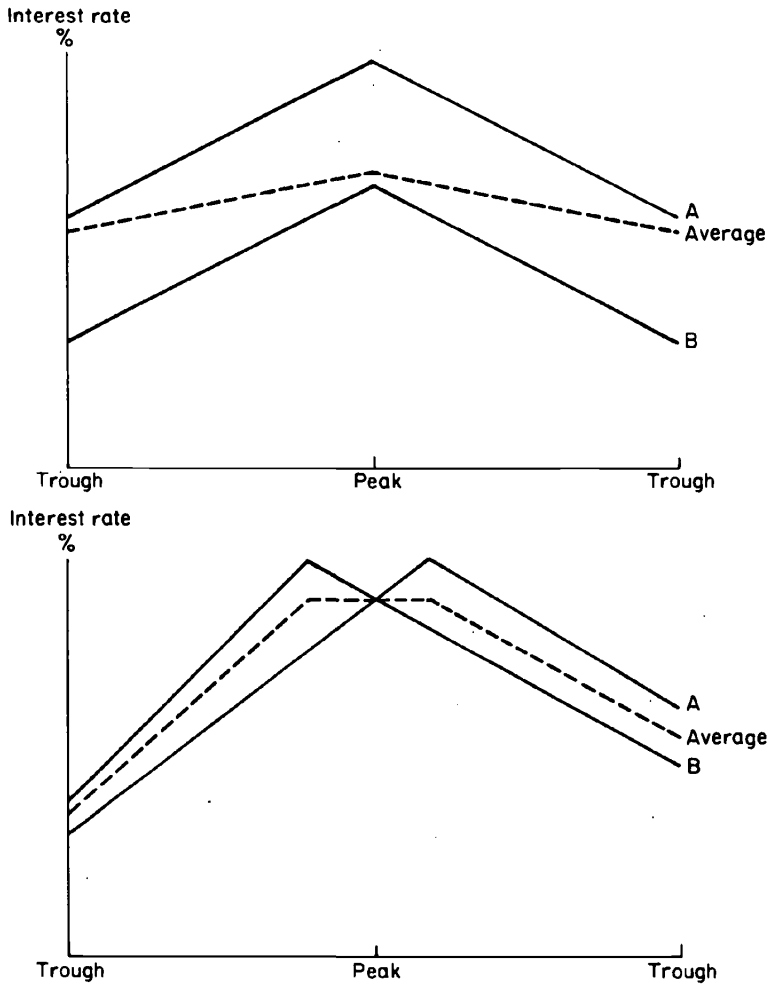
In testing the hypothesis, we examined cyclical variability in the mix of loan characteristics for which data are available. The loan-value ratios and maturities on conventional mortgages by life insurance companies during 1951–63, showed negligible cyclical variability (see Table 3-2). During the 1954 period of declining yields, for example, the average maturity on conventional loans rose by sixteen months and the loan-value ratio by only two-tenths of a percentage point. As noted in Chapter 2, cross-section regression analysis suggests that such increases would not affect yields significantly.

Cyclical changes in borrower characteristics associated with risk could affect cyclical yield variability. This appears to be the case in at least one other negotiated loan market. A larger proportion of commercial bank business loans are to prime borrowers at interest rate peaks than at troughs, and this tends to dampen variability in average business loan rates.[11] There is no evidence, however, of a similar

[10] *Ibid.*, pp. 77 and 78.

[11] Albert M. Wojnilower and Richard E. Speagle, "The Prime Rate," in *Essays in Money and Credit,* Federal Reserve Bank of New York, 1964, pp. 50–51.

FIGURE 3-1
HYPOTHETICAL CYCLICAL CHANGES IN INTEREST RATES



tendency in conventional mortgage loans by life insurance companies. The only measure of borrower risk available from the time series is the average property value underlying the series.[12] Trend-adjusted

[12] On a cross-section basis, property value appears to be a better measure of borrower risk than current income, probably because property value is a better proxy for permanent income. When effective yield on conventional loans is re-

TABLE 3-2

Changes in Maturities and Loan-Value Ratios During Periods of Cyclical Rise and Decline in Mortgage Yields, 1953 – 63

	Periods of Rise in Yields						
	1951-54		1954-58		1958-60		Average
	Change	Per Month	Change	Per Month	Change	Per Month	Per Month
	Changes in Maturity (months)						
Conventional	9.10	.26	18.80	.48	11.60	.55	.42
FHA	42.20	1.32	.40	.01	14.00	.78	.65
VA	-6.70	-.21	-10.00	-.27	4.80	.27	.14
	Changes in Loan-Value Ratio (percentage points)						
Conventional	1.00	.03	2.00	.05	3.40	.16	.07
FHA	2.60	.08	4.30	1.20	.60	.03	.09
VA	-3.00	-.09	-4.30	-.12	-.70	-.04	-.09

	Periods of Decline in Yields						
	1954		1958		1960-63		Average
	Change	Per Month	Change	Per Month	Change	Per Month	Per Month
	Changes in Maturity (months)						
Conventional	16.10	1.61	11.90	1.49	30.10	.75	1.20
FHA	9.90	.66	22.50	3.75	8.50	.19	.63
VA	48.60	3.20	29.50	4.91	-2.50	-.06	1.15
	Changes in Loan-Value Ratio (percentage points)						
Conventional	.20	.02	.30	.04	0.00	0.00	.01
FHA	.60	.04	1.50	.24	1.60	.04	.06
VA	1.90	.13	7.20	1.20	-1.40	-.03	.12

Note: Changes are calculated from three-month averages centered on turning points in conventional yields (for changes in conventional terms) and in FHA yields (for changes in FHA and VA terms). Terminal date for the 1960 – 63 decline is November 1963.

Source: NBER series.

cyclical fluctuations in average property value are in the wrong direction. Values rose considerably faster during three periods of declining yields during 1951–66 than during four periods of rising yields, and therefore tend to *increase* cyclical yield amplitude rather than dampen it.[18]

A potentially more promising application of the shift-in-mix hypothesis is to shifts in lender and geographical mix, since these are the most important source of yield variability on a cross-section basis. Actually, cyclical changes in lender and geographical mix have a neglible effect on over-all cyclical yield variability. This was shown in Chapter 2, Table 2-2.

Following the change-in-mix hypothesis, the FHA mortgage series would be expected to have greater amplitude than conventional series when the two are measured on a comparable basis. Since cross-section yield variability is lower on FHAs than on conventionals and the mix of FHA yield determinants has less cyclical sensitivity (see Table 3-2), changes in mix would dampen yield variability less on FHAs. In fact, however, the amplitude of the FHA authorization series is not significantly different from that of the conventional authorization series (see Table 3-1).

Fourth, the relatively narrow cyclical amplitude of mortgage yields could arise from greater differentiation within the mortgage category which would cause differences in cyclical phasing among the various components of the aggregate. This is illustrated in the lower panel of Figure 3-1. Without any change in mix, the two components of the total may reach a turning point at different times, in which case the amplitude of the average will be smaller than that of either component. The greater the number of component series and the greater the timing differences between them, the stronger will be this dampening tendency. It is likely that conventional mortgage loan series are more heterogeneous than bond series, and thus, in effect, contain more component series with independent cyclical phasing.

This explanation implies, however, that high-grade bond yield series

gressed separately on property value and income, coefficients are negative for both and always larger for value; when value and income are included in the same regression, the latter is much smaller and frequently not significant. On a time series basis, of course, property value is affected by changes in price levels, as well as by changes in the composition of home buyers.

[18] It is unlikely, in any case, that the effect is of quantitative importance. The relationship between property value and yield is smaller for life insurance companies than for other lender groups, reflecting the companies' tendency to maintain relatively conservative standards.

will have a wider cyclical amplitude than lower-grade series, since the former tend to be more homogeneous; similarly, FHA series would be expected to have a wider amplitude than conventional series. Table 3-1 shows that for neither bonds nor mortgages is this the case.

A fifth possible explanation of the relatively narrow amplitude of conventional mortgage yields is based on cyclical changes in risk premiums. It could be argued that the risk premium on mortgages relative to bonds will be smaller at cyclical peaks, which are associated with high levels of business activity, than at troughs. Conventional mortgages in general are riskier than high-grade bonds, and as economic conditions become increasingly favorable, premiums narrow on riskier instruments. To put it differently, the quality of conventional mortgages improves more than that of high-grade bonds during periods of economic expansion.

An indirect test of this hypothesis is as follows: if a decline in risk premiums accounted for the reduction in yield differentials between conventional mortgages and high-grade bonds during business expansions, reductions in yield differential, between high-grade and low-grade bonds and between FHA and conventional mortgages, should have occurred as well. A comparison of yield differentials at business cycle peaks and troughs does not support this hypothesis, as shown in Table 3-3. The changes in the differential between conventional mortgages and high-grade bond yields at reference cycle peaks and troughs is significant at the 1 per cent level, while the other changes are not significant (in two cases they have the wrong sign).[14]

[14] Avery Cohan points out that changes in the yield differential are not a perfect proxy for changes in "quality," if quality is defined as the probability that a loan will be repaid. Assume, for example, that the yield differential between a riskless one-year security and a risky security of the same maturity reflects only the probability of loss attached to the latter. At the end of the year, the value of the riskless security will be $1 + G$ where G is the contract rate on that security, while the value of the risky security will be $(1 + r)p$ where r is the contract rate on the risky security and p is the probability that the principal and interest will be paid. The risk premium included in r is, in theory, just large enough to equate the future value of both securities, $1 + G = (1 + r)p$ and $p = \frac{1 + G}{1 + r}$. (It can be shown, similarly, that if both securities have a maturity of n years, $p = \left[\frac{1 + G}{1 + r}\right]^n$.) This means that if the level of G rises, r must rise even more to maintain a constant p. The risk premium expressed as basis points of yield must get larger even though the probability of loss is constant. The required change in the yield differential, however, is very small. For example, a cyclical rise in G on the order of those shown in Appendix Table 3-1 would require a rise of two to three basis points in the conventional mortgage-Aaa bond-yield differential in order to maintain a constant risk premium.

TABLE 3-3

Comparison of Yield Differentials at Reference Cycle Peaks and Troughs

Yield Differential	Average 3 Peaks	Average 3 Troughs	Troughs Less Peaks
Conv. mtgs. less Aaa corp.	1.53	1.86	.33
Conv. mtgs. less Aaa state and local	2.42	2.86	.44
Aaa corp. less Baa corp.	.71	.83	.12
Aaa state and local less Baa state and local	1.04	1.01	-.03
Conv. mtgs. less FHA mtgs.	.05	-.01	-.06

Source: Appendix Table 3-1.

This test, however, depends heavily on the assumption that lender reevaluations of security risk can be tied to reference-cycle turning points. Another test, crude but perhaps more meaningful in light of our ignorance on this point, is to compare average yield differentials during recession periods with those during expansions. This test is more favorable to the risk-premium hypothesis. As shown in Table 3-4, on corporate and state and local bonds the yield differential between Aaa and Baa issues was higher in each of four recession periods than in the subsequent expansion. This suggests that some cyclical reevaluation of risk may well have occurred on bonds. No similar pattern was evident, however, for the yield differential between conventional and FHA mortgages.

Cyclical changes in mortgage delinquencies may even be more relevant. One would not expect a recession to raise the ex ante risk premium on conventional mortgages unless the repayment experience on mortgages held in portfolio was appreciably affected by the recession. The evidence on delinquencies by and large does not support the risk-premium hypothesis. Major lender groups, including life insurance companies, have found a modest tendency for delinquencies to rise during recent recessions, but this appears to be accounted for entirely by FHA and VA mortgages.[15] A study of monthly time series covering

[15] Some of the evidence on this is shown in James S. Earley, "The Quality of Postwar Credit in the United States," National Bureau of Economic Research, September 1965, mimeograph. A complete compendium of delinquency and

TABLE 3-4

Yield Differential Between Baa and Aaa Bonds and Between Conventional and FHA Mortgages During Business Expansions and Recessions
(basis points)

Recession (R) or Expansion (E)		Baa Less Aaa: Corporate	Baa Less Aaa: State and Local	Conventional Less FHA
Nov. 1948 - Oct. 1949	(R)	75	102	8
Nov. 1949 - June 1953	(E)	57	85	24
July 1953 - Aug. 1954	(R)	62	109	11
Sept. 1954 - June 1957	(E)	50	97	9
July 1957 - April 1958	(R)	98	108	2
May 1958 - April 1960	(E)	75	94	-11
May 1960 - Feb. 1961	(R)	79	96	-11
March 1961 - July 1967	(E)	57	53	-6

Source: Appendix Tables 3-2 and 9-4 plus Moody's.

conventional mortgages does not reveal any cyclical sensitivity during the period since 1953, for which monthly data are available.

In the final hypothesis considered here, the narrow cyclical amplitude of mortgage yields relative to bond yields reflects differences in market organization. For a number of reasons, rates tend to be relatively sluggish in markets where borrowers and lenders negotiate directly —as opposed to impersonal dealer-type markets. First, negotiated markets involve bilateral bargaining which will moderate changes in rates if there is continuity in the relationship between borrower and lender, as in the case of commercial banks and their business-loan customers or of life insurance companies that acquire mortgages through correspondents. A concern for maintaining relationships over the long run blunts the tendency to maximize market position in the short run.

Second, lenders in negotiated markets may have heavy nontransferable overhead costs geared to the specific market, as in the case of

foreclosure series is listed in *Measures of Credit Risk and Experience,* Edgar R. Fiedler, New York, NBER, forthcoming.

life insurance companies that acquire mortgages through their own network of branch offices. Such lenders find it profitable to maintain relative stability in their operations; since each individual lender is in some degree operating in a separate market, this implies rate stability relative to markets that lenders feel free to leave altogether.

Third, lenders in negotiated markets tend to lag in adjusting their offer functions to yield changes in dealer markets (see below). If basic credit demands are less stable in the dealer markets, the full range of rate changes in these markets will not be transmitted to the negotiated market. Because of the transmission lag, peaks and troughs in the dealer market are in effect "lopped off." Here, the explanation of why mortgage yields have smaller cyclical amplitude merges with the explanation given below of why mortgage yields lag bond yields.

Clearly, the market-organization hypothesis goes beyond the immediate focus of this paper and into largely unexplored terrain. It would explain, however, not only the small amplitude of mortgage yields relative to bond yields but also the narrower amplitude of the rates on commercial bank business loans than those on open-market paper of comparable maturity.[16] The amplitude of directly placed bonds also appears to be less than that of marketable new issues.[17] It is also of interest that the FHA secondary market yield series is more volatile than FHA authorization series though less volatile than bond yields (Table 3-1). The market organization underlying the FHA secondary market lies somewhere between that of the markets underlying the life insurance company authorization series and the bond yield series.[18] We will note in Chapter 4, moreover, that direct mort-

[16] For evidence of this, see Phillip Cagan, *Changes in the Cyclical Behavior of Interest Rates,* Occasional Paper 100, New York, NBER, 1966, p. 9. An alternative explanation is given by Donald Hodgman, *Commercial Bank Loan and Investment Policy,* Urbana, Ill., 1963, pp. 126–131.

[17] See Cohan, *Yields on Direct Placements,* p. 72. Since directly placed bonds are new issues, it is appropriate to compare them to newly issued marketable bonds. A comparison of Cohan's series on direct placements with mortgages during the period 1951–61 shows that the former have greater amplitude, despite the fact that both are new-issues series and both pertain to negotiated markets. The reason may be that the characteristics of negotiated markets which generate relative yield stability are less powerful in the market for direct placements. Nontransferable overhead costs would not be as large as they are for mortgages, and basic credit demands probably would be as unstable as for marketable bonds.

[18] While there are no dealers in the FHA secondary market, brokers are often used, and buyers and sellers tend to canvass the market for the best available deal.

gage loan series are more sensitive than correspondent loan series, and this is also explained most plausibly by the market-organization hypothesis.

The distinction between dealer and negotiated markets cuts across a distinction between new-issue markets and markets for outstanding instruments. Only in the case of marketable bonds do we have series for both new and outstanding issues, and these show that new-issue series have greater amplitude. This can be explained by differences in market organization within the dealer-market category. Conard and Frankena, in their study of the yield differential between new and outstanding bonds, suggest that "forces determining interest rates operate more directly and immediately on yields in the new issue market and yields in the seasoned market adjust to their equilibrium level only with a lag. . . ."[19] They explain this largely in terms of frictions and imperfections in the dealer market for seasoned securities that are not present in the new-issue market. This suggests that a mortgage yield series covering outstanding issues, if there was one, would show even less amplitude than the existing series, which cover new issues.

Timing at Turning Points

Klaman noted that "changes in mortgage interest rates lagged continually behind changes in bond yields throughout the post-war decade." [20] This lag is reduced by one to six months when transactions are recorded as of the date of loan authorization rather than the date of disbursement. The lag is not eliminated, however, as Table 3-5 indicates. At five turning points during 1954–60, conventional yields lagged behind government bond yields from four to seven months. These might be considered "normal" lags. Lags at the 1949, 1951, and 1965 turning points were considerably longer, but they were affected by special developments that changed the underlying relationship between mortgage and bond yields.[21] The 1965 case will be discussed below.

[19] "The Yield Spread between New and Seasoned Corporate Bonds, 1952–63," in Jack M. Guttentag and Phillip Cagan, *Essays on Interest Rates,* Volume I, New York, NBER, 1969.

[20] Klaman, p. 78.

[21] The changing relationship between mortgage and bond yields during 1949–51 was discussed in Jack Guttentag's "Some Studies of the Post-World War II Residential Construction and Mortgage Markets," unpublished Ph.D. dissertation, Columbia University, 1958, pp. 82–86.

TABLE 3-5

Lag at Turning Points, Conventional Mortgage Yields Relative to Bond Yields

	Turning Point in Conventional Yields	Lag in Conventional Yields (months)			
		U.S. Gov't. Long-Term	Corporate		
			Aaa	Aa New	Baa
	P Dec. 1949[a]	14	13		12
	T Feb. 1951	14	13		0
"Normal"	P Jan. 1954	7	7	8	4
	T Nov. 1954	4	1	8	-2
	P Feb. 1958	4	5	4	3
	T Oct. 1958	6	4	4	3
	P July 1960	6	6	10	5
	T Sept. 1965[b]	52	30	32	6
	1954-60 average	5	5	7	3

[a]Based on data for one company.

[b]Based on FHLBB series on new house purchases.

Source: National Bureau of Economic Research compilations, Federal Reserve Board, Moody's.

Since dating of turning points is unavoidably arbitrary at some junctures, another measure of cyclical sensitivity is employed in Table 3-6. This table uses only one turning point—on long-term government bond yields—and measures yield changes in all the series during periods of specified length (e.g., five, ten and fifteen months) beginning with that date. Relative sensitivity is measured by the rise (decline) during the periods following troughs (peaks) in government bond yields.[22] These comparisons show mortgage yields to be relatively insensitive at every one of the five turning points in the table. As an example, ten months after the April 1958 trough in government bond yields, government bonds were up eighty basis points, high-grade corporates were up fifty to fifty-four basis points, while direct conventional mortgage yields were up one basis point.

[22] These comparisons use series on direct conventional mortgage loans only, since the correspondent loan component may have some residual recording lag. The periods following yield peaks are shorter than those following troughs to avoid extending past the subsequent turning point. The trough following the 1960 peak is not included in this table because the trough dates for the different series are spread over an extraordinarily long period. Turning points in government bond yields are based on seasonally unadjusted series and differ in some cases from those shown in Cagan.

TABLE 3-6

Changes in Yields on Direct Mortgage Loans and on Bonds
Following Turning Points in U.S. Government Bond Yields

Turning Points in Long-Term Government Bond Yields	No. of Months After Turning Point in Bond Yields	Changes in Yield (basis points)				
		Long-Term Governments (1)	Corporate Aaa (2)	Corporate Aa New (3)	Mortgages (direct authorization) Conventional (4)	Mortgages (direct authorization) FHA (5)
Troughs						
July 1954	+5	+12	+1	+4	-4	+1
	+10	+34	+15	+26	-3	+6
	+15	+40	+21	+27	+8	+18
April 1958	+5	+63	+49	+83	-24	-19
	+10	+80	+54	+50	+1	+3
	+15	+99	+87	+108	0	+8
Peaks						
June 1953	+4	-26	-24	-58	+21	+16
	+8	-51	-45	-75	+21	+13
	+12	-58	-50	-78	+13	+7
Oct. 1957	+3	-49	-50	-119	+8	+8
	+6	-61	-50	-106	+4	+6
	+9	-37	-43	-93	-5	-7
Jan. 1960	+4	-21	-15	-4	+7	+5
	+8	-55	-36	-30	+5	-3
	+12	-48	-29	-40	-1	-8

One hypothesis used to explain the lag in conventional mortgage yields is that small changes in market demand and supply register first in changes in loan-value ratios and maturities, and this retards the adjustment of yields. If this is true, terms typically should reach a cyclical turning point before yields. Table 3-7 shows cyclical turning points in loan-value ratios and maturities matching five turning points in yields in the new NBER series (observed separately for each type of loan and for weighted totals covering all loans). Some of these observations are obscured by the effects of changes in legal limits, while in other cases there was no clearly defined turning point in terms. With these exclusions, there are twenty-two usable observations. In eight cases, terms led yields; in five cases, terms lagged; in nine cases, the turning points in terms were within a month of the turning point in yields. If these were independent observations, an eight-nine-five distribution could easily occur by chance and would provide little support for the hypothesis that sensitivity of terms retards yield adjustments.

Since the twenty-two observations are drawn from only five turning points, however, they are not necessarily independent observations. Different characteristics on the same type of mortgage, or the same characteristic on a different type of mortgage, may be subject to similar influences at a given turning point. It is instructive, therefore, to view each of the five turning points in yield as one observation. From this standpoint, the evidence provides no support for the hypothesis at all. At only one of the turning points, the interest rate peak in early 1958, was there a clear tendency for terms to precede yields; seven of the eight "lead" observations come from this turning point.[23] Terms lagged yields at the other four turning points, although the 1953 turning point has only one valid observation.

The new FHLBB series on conventional loans provide additional evidence to test the hypothesis that sensitivity in terms retards adjustments in rates. Although these data as yet cover only two turning points, series are available for five lender groups, separately for new and existing properties, or twenty cases for each loan characteristic. There were eleven identifiable turning points for maturities and the maturities lagged their respective contract rate or had coincident timing

[23] As shown in Table 3-5, furthermore, the lag of mortgage yields behind bond yields at this turning point was shorter than usual, whereas it should have been longer according to the sensitivity-of-terms hypothesis used to explain this lag.

TABLE 3-7

Cyclical Turning Points in Loan-Value Ratios and Maturities Corresponding to Turning Points in Yields

	Cyclical Peaks and Troughs in Yield					Number of Cases		
	P	T	P	T	P	Terms Lead Yields	Terms Lag Yields	Same Turning Points[a]
Gross Yield								
FHA and VA	Dec. 1953	Feb. 1955	March 1958	Sept. 1958	March 1960			
Conventional	Jan. 1954	Nov. 1954	Feb. 1958	Oct. 1958	July 1960			
All, weighted	Dec. 1953	Oct. 1954	Feb. 1958	Oct. 1958	May 1960			
	Cyclical Troughs and Peaks in Terms[b]							
	T	P	T	P	T			
Conventional								
Maturity	Nov. 1953	Dec. 1954	Aug. 1956	Jan. 1959	March 1961	2	2	1
Loan-value ratio	ntp	ntp	Aug. 1957	Sept. 1959	ntp	1	1	
FHA								
Maturity	June 1953[c]	May 1955	Feb. 1957[c]	Sept. 1958	ntp		1	1
Loan-value ratio	July 1954[c]	June 1955	Jan. 1957[c]	Sept. 1958	ntp		1	1
VA								
Maturity	May 1953[c]	Dec. 1954	Jan. 1957	ntp	ntp	2		
Loan-value ratio	Aug. 1953[c]	Oct. 1954	ntp	ntp	ntp	1		
All, weighted								
Maturity	Aug. 1952[c]	Oct. 1954	Sept. 1957	Dec. 1959	Dec. 1960	1	2	1
Loan-value ratio	Aug. 1952[c]	Oct. 1954	Aug. 1957	Dec. 1959	Dec. 1960	1	2	1

[a]Within one month of corresponding yield series.

[b]Peaks (troughs) in terms corresponding to troughs (peaks) in yields.

[c]Affected by changes in legal limits.

Source: NBER series.

ntp = No well-defined turning point.

TABLE 3-8

Leads and Lags of Loan-Value Ratios, Maturities, and Fees and Charges Relative to Contract Rate at the 1965 Trough, and the 1966 – 67 peak in Contract Rate in Ten Conventional Home Loan Series

Characteristic	Number of Identifiable Turning Points in Characteristic	Number of Cases		
		Char. Leads Rate	Char. Lags Rate	Same Turning Point[a]
Maturity	11	0	4	7
Loan-value	12	2	4	6
Fees and charges	9	0	7	2

[a]Within one month of corresponding rate series.
Source: Federal Home Loan Bank Board.

in each case (Table 3-8). Similarly, only two of the twelve identifiable turning points in loan-value ratios led their respective contract rate. Thus, the data do not support the hypothesis that sensitivity in terms retards adjustments in yields at cyclical turning points.

The lag in conventional yields is not explained either by any special sensitivity of fees and charges. The NBER conventional contract-rate series has exactly the same turning points as the gross yield series except at the 1958 peak when the contract rate series leads by one month. The FHLBB series show fees lagging rates at the 1965 trough and 1966–67 peak in most cases (Table 3-8).

Short-term developments affecting general yield levels normally originate in the bond markets, and this may be an important factor underlying the tendency of mortgage yields to lag bond yields. The basic demand for mortgage credit (that is, the demand under given mortgage credit terms) is affected mainly by demographic factors and by "normal" income, changing little in the short run.[24] Demands on the capital markets by the federal government and nonfinancial corporations, in contrast, are subject to sharp cyclical fluctuations.[25]

Bond-yield changes could, of course, be transmitted immediately to the mortgage market; but, in fact, there is a lag. For a number of rea-

[24] See Sherman Maisel, "A Theory of Fluctuations in Residential Construction Starts," *American Economic Review*, June 1963, pp. 374–376.

[25] See Guttentag, "The Short Cycle in Residential Construction," pp. 292–294.

sons, there is virtually no arbitrage between the two markets.[26] Rate adjustments in the mortgage market depend almost entirely on the activities of primary lenders. These lenders appear to be responsive to pervasive but not to short-lived changes in bond yields. As one lender expressed it, "To attempt to follow every wiggle in bond yields would unduly disrupt our market relationships." But a pervasive movement in bond yields usually cannot be distinguished from a reversible one until the passage of time proves it out; the result is that mortgage yields lag. As noted earlier, this lag in conjunction with relatively stable mortgage credit demand may be partly responsible for the narrow cyclical amplitude of mortgage yields.

Longer-run Changes and the 1961–66 Experience

The long-run relationship between conventional mortgage yields and high-grade bond yields is examined in two ways. Chart 3-2 shows the yield differential (mortgages less long-term government bonds) during the period 1948–67.[27] This series is affected by the tendency of mortgage yields to lag bond yields by periods of varying length. Table 3-9 shows differentials at cyclical peaks and troughs only, with the yield on each instrument measured at its respective peak or trough. Thus, at peak 4, the yield on conventional mortgages in July 1960 is compared to the yield on long-term governments in January 1960. These are referred to as "matching differentials."

During the period 1949–60, the monthly series show marked cyclical fluctuations with some indication of widening amplitude, but there is no indication of a trend. Similarly, the matching differentials at the first three troughs and four peaks show no indication of trend.

[26] First, because of differentiation within the mortgage market, yield relationships are not reliable enough to permit effective arbitrage. (Arbitrage transactions must be carried out in individual securities and depend on reasonably reliable yield relationships between the instruments being arbitraged.) Second, the cost of arbitrage transactions involving mortgages is high because the market for outstanding mortgages is rudimentary. Brokers exist who will attempt to sell mortgages on a commission basis, but there are no dealers who will take seasoned mortgages into portfolio. Third, the secondary mortgage market, such as it is, has no direct organizational links to the bond market.

[27] The conventional mortgage yield series used in this chart are based on the new National Bureau series for 1948–63, and the FHLBB series covering loans by life insurance companies on new properties for 1964–67. The entire series is contained in Appendix Table 3-2.

CHART 3-2

CONVENTIONAL MORTGAGE YIELDS AND LONG-TERM GOVERNMENT BOND YIELDS, 1948–67

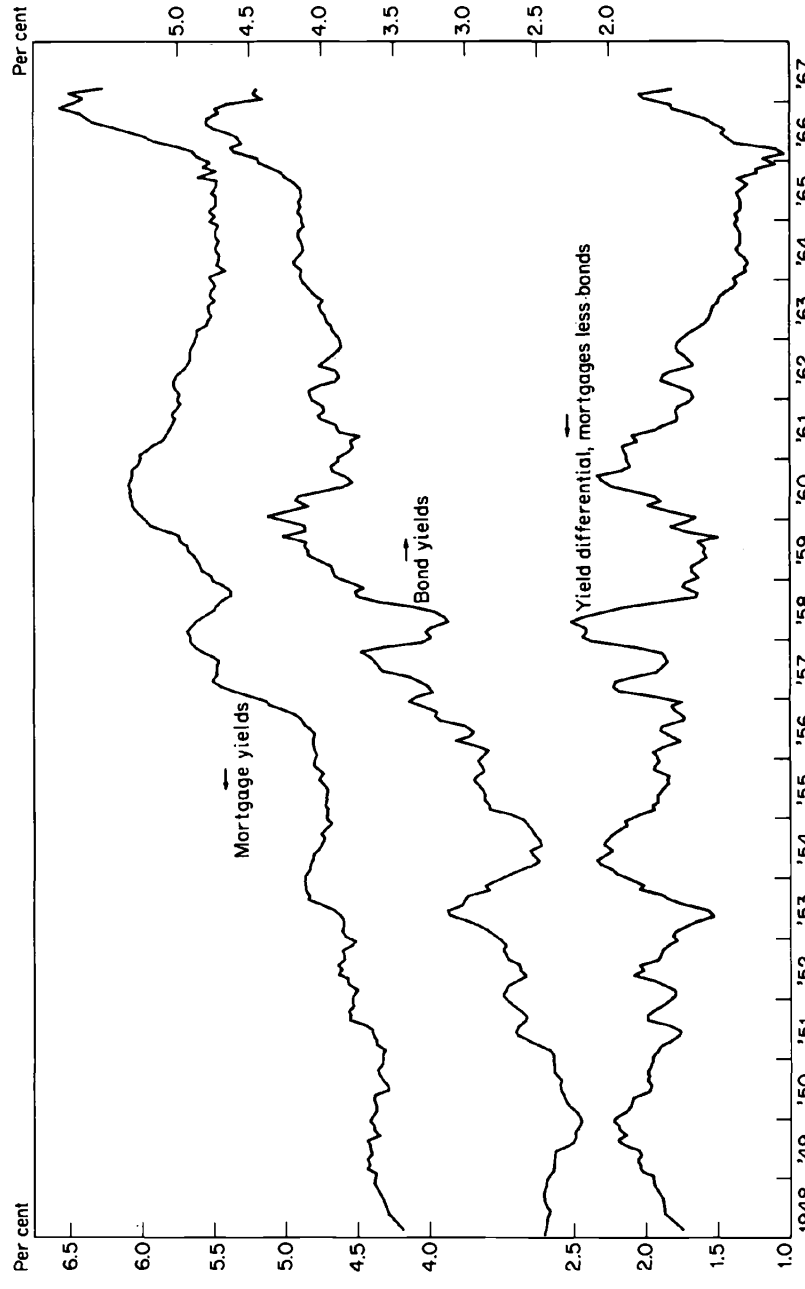


TABLE 3-9

Yield Differentials Between Conventional Mortgages and Bonds, at Cyclical Peaks and Troughs

	Dates					Yield Differentials				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
				Cyclical Peaks						
Conventional mortgages	Dec. 1949[a]	Jan. 1954	Feb. 1958	July 1960	Nov. 1966					
U.S. gov't. long term	Oct. 1948	June 1953	Oct. 1957	Jan. 1960	Sept. 1966	1.96	1.74	1.96	1.73	1.76
Corporate Aaa	Nov. 1948	June 1953	Sept. 1957	Jan. 1960	Sept. 1966	1.57	1.47	1.57	1.49	1.06
Corporate Aa (new)		May 1953	Oct. 1957	Sept. 1959	Dec. 1966	–	.99	.78	.62	.62
Corporate Baa	Dec. 1948	Sept. 1953	Nov. 1957	Feb. 1960	Dec. 1966	88	.99	.60	.76	.37
				Cyclical Troughs						
Conventional mortgages	Feb. 1951	Nov. 1954	Oct. 1958	Sept. 1965						
U.S. gov't. long term	Dec. 1949	July 1954	April 1958	May 1961		2.12	2.21	2.26	1.77	
Corporate Aaa	Jan. 1950	Oct. 1954	June 1958	March 1963		1.74	1.81	1.81	1.31	
Corporate Aa (new)		March 1954	June 1958	Jan. 1963		–	1.77	1.57	1.30	
Corporate Baa	Feb. 1951	Jan. 1955	July 1958	March 1965		1.15	1.23	.85	.72	

Note: Yield differentials are measured at peaks and troughs of each series.

[a]Based on data for one company.

Source: Conventional mortgages are the NBER series except at trough (4) and peak (5) which are the FHLBB series for life insurance companies covering purchase of new homes (contract rate); Long-term government bonds are the Federal Reserve series; corporate bond series are from Moody's. Turning points are based on series unadjusted for seasonal variation, and differ in some cases from those in Cagan, *Changes in the Cyclical Behavior of Interest Rates*

During the cyclical decline in yields that began in 1960, however, mortgage yields continued to fall long past the point at which bond yields had begun to drift upward.[28] As a result, the 1960–65 decline in the monthly differential was larger than any earlier cyclical decline (as measured in basis points from peak to trough), and brought the differential some forty-five to forty-eight basis points below the previous lows reached in 1959 and 1953. Similarly, the matching differential at trough 4 was markedly lower than at any of the previous troughs. An observer at the end of 1965 might have speculated, as we in fact did in an early draft of this paper, that perhaps the yield differential had been "permanently" reduced.

The dramatic events of 1966—mortgage yields rose more in one year than they had declined in the previous five—added an additional dimension to this experience. The rise in the yield differential during 1966 was larger than any earlier cyclical rise, and it brought the differential back to high levels, although still below earlier peaks. Thus, it appears less plausible now than at the end of 1965 that a permanent decline in the differential has occurred. What needs explaining is the greater amplitude of the yield differential over the period 1961–66 than in earlier periods, which reflects the increased amplitude of the mortgage yield series during this period.

In order to explain the wide amplitude of mortgage yields during 1961–66 we begin with the following crude "facts." Comparing the 1961–65 period of decline in mortgage yields with the preceding six years, net mortgage acquisitions on one- to four-family properties rose from $65.7 billion to $72.3 billion, or by $6.6 billion. Commercial banks accounted for most of the increase, their acquisitions rising by $5.1 billion. During 1966, when mortgage yields rose precipitously, total net acquisitions dropped $4.6 billion, all of it accounted for by savings institutions. Commercial bank acquisitions held up in 1966, in contrast to earlier periods of monetary restraint when banks tended to desert the mortgage market.

The hypothesis advanced here is that structural changes involving commercial bank policy toward time deposits, and a marked increase in the relative importance of time deposits in bank liability mix, were responsible for the marked variability in mortgage yields during

[28] The dispersion of turning points in various yield series at trough 4 is extremely wide, and several of the series show multiple bottoms. This makes timing comparisons at this turning point hazardous, but the value of matching yield differentials is not significantly affected by the choice of turning point.

1961–66. The shift in bank liability mix encouraged a portfolio shift into mortgages which put downward pressure on mortgage yields during 1961–65. When tight money emerged in 1966, commercial banks bid savings accounts away from savings institutions which channel most of their funds into mortgages, thus placing upward pressure on mortgage yields—stronger pressure than in earlier periods of monetary restraint when banks had raised funds by liquidating government securities.[29]

The marginal value of a dollar of time deposits to commercial banks has grown steadily over the last decade or so. Their government securities portfolios have trended downward ever since World War II. Beginning in the late 1950's and early 1960's, one bank after another found itself in a position where it could no longer rely on government securities liquidation as a means of meeting loan demands in excess of deposit growth. Demand deposit growth, furthermore, had lagged throughout the entire post-World War II period. As a result, time deposits emerged as a valuable source of funds over which banks could exercise some degree of control.

The shift to time deposits was most pronounced after 1961. In that year, New York City banks began to issue large-denomination negotiable certificates of deposit, and they were followed by large banks in other centers. Both large and small banks began to compete vigorously with savings institutions for smaller accounts. Rate differentials between savings accounts at commercial banks and at savings institutions narrowed, rate advertising increased in intensity, and probably elasticity of substitution rose.

Table 3-10 shows three measures of change in bank liability structure during each of three complete cycles in mortgage yields. Each of the three measures shows a marked shift toward time deposits in the 1960–66 cycle relative to the two earlier cycles. The ratio of time deposits to total deposits rose by .68 percentage points per quarter during the 1960–66 cycle, compared to increases of .27 points and .26 points in the two preceding cycles.

As their liability mix shifted toward time deposits, the asset preferences of commercial banks also changed. It is part of received bank

[29] An underlying condition was, of course, the willingness of the Federal Reserve to allow the commercial banks to compete vigorously for time deposits by keeping Regulation Q ceiling rates above constraint levels (until late in 1966 when the System decided that competition for savings had gone so far as to threaten disaster to the residential sector, and they rolled back the ceilings on some types of accounts).

TABLE 3-10

Measures of Change in Bank Liability Structure
During Cycles in Mortgage Interest Rates, 1953 – 66

Mortgage Interest Rate Cycle	$\frac{TD_1}{D_1} - \frac{TD_0}{D_0}$	$\frac{TD_1 - TD_0}{TD_0} - \frac{DD_1 - DD_0}{DD_0}$	$\frac{TD_1 - TD_0}{D_1 - D_0}$
	(1)	(2)	(3)
Decline IV 1953-I 1955	.25	1.27	.52
Rise II 1955-IV 1957	.28	1.41	.80
Total cycle	.27	1.36	.70
Decline I 1958-III 1958	.67	3.20	.73
Rise IV 1958-I 1960	.06	.26	.46
Total cycle	.26	1.24	.55
Decline II 1960-III 1965	.68	4.39	.81
Rise IV 1965-IV 1966	.41	1.76	.77
Total cycle	.63	3.90	.80

TD = Time deposits.
DD = Demand deposits.
D = Total deposits.

Subscripts zero and one refer to beginning and end of period, respectively. Measures in columns 1 and 2 show differences per quarter.

Source: Board of Governors of the Federal Reserve System, Flow of Funds Accounts.

management philosophy that mortgages can be prudently acquired with funds obtained from time deposits.[30] Cross-section analysis using balance sheet data invariably shows a positive correlation between the relative importance of time deposits on the liability side and mortgages on the asset side.[31] This appears to reflect a combination of cost and liquidity considerations. If deposit costs are high, bankers feel they must invest in higher yielding assets.[32] In addition, time deposits are generally believed to require a smaller liquidity provision than demand deposits, so that asset structure can safely be made less liquid.

[30] See Fred G. Delong, "Liquidity Requirements and Employment of Funds," in Kalman J. Cohen and Frederick S. Hammer (eds.), *Analytical Methods in Banking*, Homewood, Ill., 1966, pp. 38–53.

[31] For 416 individual member banks in the Philadelphia Federal Reserve District on December 31, 1960, the coefficient of correlation between the ratio of time to total deposits and the ratio of mortgages to total assets was .55.

[32] This implies profit-target behavior by banks rather than profit maximization, which many economists find difficult to accept.

TABLE 3-11

Changes in Real Estate Loans and in State and Local Securities of 416 Member Banks, Related to Changes in Deposits, December 1960 to June 1964

	Real Estate Loan Equations			State and Local Government Securities Equations		
Independent Variables	*b*-Coef.	*T*	R^2	*b*-Coef.	*T*	R^2
Variant 1.						
Per cent change in total deposits	.39	7.1	.39	2.13	1.7	.07
Per cent change in time deposits	.50	22.3		-.57	.2	
Variant 2.						
Per cent change in time deposits	.67	120.8	.39	.19	.1	.07
Per cent change in demand deposits	.22	8.1		1.56	3.3	
Variant 3.						
Per cent change in total deposits	1.22	98.8	.36	.07	.0	.07
Per cent change in demand deposits	-.27	5.4		1.63	1.7	

Note to Table 3-11

Note: The dependent variables are percentage change in real estate loans (in real estate loan equations), and percentage change in state and local government securities (in state and local government securities equations). All equations include, in addition to the independent variables listed, the December 1960 ratio of time deposits to total deposits, size class of bank, and the December 1960 ratio of real estate loans (or state and local securities) to total assets.

To obtain more direct evidence on this relationship, focusing on *changes* in mortgage holdings and *changes* in time deposits during the period under study, we performed the following experiment. Using data on 416 member banks in the Philadelphia Federal Reserve District,[33] we regressed the percentage change in mortgage loans during the period December 1960–June 1964 on various combinations of deposit change. To avoid the effects of relationships between changes and levels in these magnitudes, the initial ratios of mortgages to assets and time deposits to total deposits (both in December 1960) were also included as variables in the regressions. As a form of control, the same procedure was used to explain the percentage change in state and local securities, which banks also acquired in substantial volume during this period. These equations, however, included the initial ratio of state and local securities to assets rather than the ratio of mortgages to assets. Some results are shown in Table 3-11.

In equation (1), the percentage change in mortgages and in state and local securities is regressed on the percentage change in time deposits and the percentage change in total deposits. The regression coefficient for the change in time deposits is positive and statistically significant in the mortgage equation, but not in the state and local equation, suggesting that only mortgage acquisitions were sensitive to the composition of deposit increase.

Equation (2) used the percentage change in time deposits and in demand deposits as separate variables in the regression. In the mortgage equation, the coefficient for time deposits was three times as large as the coefficient for demand deposits, while in the state and local equation, the coefficient for time deposits was not statistically significant.[34]

Since mortgage acquisitions by individual banks were influenced by

[33] The authors are indebted to the Federal Reserve Bank of Philadelphia for these data. Note that real estate loans in these data cover loans on nonresidential as well as residential properties.

[34] Equations were also run in which the dependent variable was the change in real estate loans as a percentage of the initial level of total assets rather than the initial level of real estate loans. The results were very much the same.

changes in their time deposits,[35] it can be inferred that mortgage acquisitions by the banking system as a whole were boosted by the pronounced shift that occurred in bank-deposit mix. This supports the view that the sharp decline in mortgage yields during 1961–65 was due, at least in part, to the marked increase in time relative to demand deposits during the period, and to a related shift in bank portfolio preferences for mortgages.

It might appear at first glance that these structural changes affecting commercial banks would *retard* the rise in mortgage yields during a period of monetary restraint such as emerged in 1966. Presumably, banks would not reduce mortgage acquisitions as sharply as in earlier periods of restraint when they viewed mortgages more as "residual" assets. Indeed, commercial banks maintained a high level of mortgage acquisitions in 1966, as shown in Table 3-12.

This view, however, neglects the effect of intensive bank competition for time deposits on inflows to savings institutions, and their mortgage lending. Although the status of mortgages in bank portfolios has risen, they remain "inferior" to business loans, the demand for which increased very sharply in 1966. The banks' determination to meet these demands, in the face of depleted liquidity positions, caused them to bid a substantial volume of funds away from the savings institutions, which, correspondingly, reduced their mortgage lending.[36] As shown in Table 3-12, the maintenance of bank mortgage lending did not begin to counterbalance the decline in lending by savings institutions losing funds to banks.[37]

[35] There is some reason to believe that the relationship is dominated by small banks. A study of fifty-three large banks by Morrison and Selden did not reveal any positive relationship between changes in real estate holdings and changes in time deposits during 1960–63. See George R. Morrison and Richard T. Selden, *Time Deposit Growth and the Employment of Bank Funds,* Association of Reserve City Bankers, February 1965, Tables A-1 and A-4.

[36] The shift in funds became so large in the summer and fall that the Federal Reserve "took a variety of steps to redress the balance in the flow of funds between business borrowers and the housing industry . . ." (*Federal Reserve Bulletin,* February 1967, p. 189). For a discussion of these measures, see the cited article.

[37] Table 3-12 shows a marked reversal in the pattern of change in savings flows and mortgage lending in the most recent cycle in mortgage yields as compared to two earlier cycles. In the two earlier ones, the net flow of savings and mortgages at savings institutions was almost as large during the period of rising yields as during the preceding period of falling yields, but in the most recent cycle, both flows were markedly lower during the period of rising yields. The pattern for commercial banks changed in the opposite way. In earlier cycles, bank time deposits and mortgage lending fell during tight-money periods while in the recent cycle both flows were maintained.

TABLE 3-12

Changes in Holdings of One- to Four-Family Mortgages and in Time and Savings Deposits by Commercial Banks and Savings Institutions During Cycles in Mortgage Interest Rates, 1953-66
(amounts in billion dollars, annual rate)

Mortgage Interest Rate Cycle	Commercial Banks		Savings Institutions		Time Deposits as Per Cent of Total Time and Savings Deposits
	Time and Savings Deposits	Mortgages	Time and Savings Deposits	Mortgages	
Decline IV 1953-I 1955	3.6	1.6	6.7	6.4	35
Rise II 1955-IV 1957	3.1	0.8	7.1	5.7	30
Decline I 1958-III 1958	9.2	1.5	8.8	6.9	51
Rise IV 1958-I 1960	1.4	1.1	8.5	7.7	14
Decline II 1960-III 1965	13.7	2.0	13.2	10.0	51
Rise IV 1965-IV 1966	14.3	2.1	8.4	4.4	63

Note: Savings institutions are mutual savings banks, savings and loan associations and credit unions. Mortgages lead one quarter.
Source: Board of Governors of the Federal Reserve System, Flow of Fund Accounts.

The liquidation of government securities by commercial banks in earlier periods of restraint had, of course, indirectly affected the flow of funds into mortgages by changing yields on alternative investments. This pressure, however, must have been more diffused and less intense than the withdrawal of funds from savings institutions which invest most of their funds in mortgages. Liquidation of government securities in earlier periods probably was absorbed in good part by reductions in "idle balances." In addition, diversified lenders, such as life insurance companies, probably responded more gradually to changes in alternative investment yields than did savings institutions to a reduction in inflows. A good case can be made that the change in bank response to tight money, from an emphasis on reducing investments to an emphasis on increasing time deposits, resulted in transmitting the effects of tight money to the mortgage market more promptly and fully than ever before.

APPENDIX TABLE 3-1

Yields on Bonds and Mortgages at Reference Cycle Peaks and Troughs

	Peaks			
	July 1953	July 1957	May 1960	Average
Conv. mortgages	4.76	5.48	6.09	
FHA mortgages	4.53	5.38	6.28	
Conv. less FHA	.23	.10	-.19	.05
Corporate Baa bonds	3.86	4.73	5.28	
Corporate Aaa bonds	3.28	3.99	4.46	
Baa less Aaa	.58	.74	.82	.71
State and local Baa bonds	3.60	4.29	4.31	
State and local Aaa bonds	2.56	3.17	3.34	
Baa less Aaa	1.04	1.12	.97	1.04
Conv. mortgages less Aaa corporate bonds	1.48	1.49	1.63	1.53
Conv. mortgages less Aaa state and local bonds	2.20	2.31	2.75	2.42

	Troughs			
	Aug. 1954	April 1958	Feb. 1961	Average
Conv. mortgages	4.74	5.63	5.96	
FHA mortgages	4.60	5.61	6.16	
Conv. less FHA	.14	.02	-.20	-.01
Corporate Baa bonds	3.49	4.67	5.07	
Corporate Aaa bonds	2.87	3.60	4.27	
Baa less Aaa	.62	1.07	.80	.83
State and local Baa bonds	2.94	3.78	4.06	
State and local Aaa bonds	1.90	2.70	3.14	
Baa less Aaa	1.04	1.08	.92	1.01
Conv. mortgages less Aaa corporate bonds	1.87	2.03	1.69	1.86
Conv. mortgages less Aaa state and local bonds	2.84	2.93	2.82	2.86

Note: Mortgage yields are from NBER authorization series, with assumed prepayment of ten years. Bond series are from Moody's.

APPENDIX TABLE 3-2

Conventional Mortgage Yields on One- to Four-Family Properties
Authorized by Life Insurance Companies, 1948-67

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
					National Bureau[a]							
1948		4.19			4.28			4.32			4.38	
1949	4.37	4.43	4.42	4.43	4.40	4.42	4.41	4.43	4.34	4.39	4.38	4.41
1950	4.39	4.37	4.37	4.39	4.38	4.29	4.29	4.31	4.34	4.37	4.34	4.34
1951	4.34	4.31	4.36	4.37	4.39	4.40	4.45	4.56	4.55	4.56	4.53	4.54
1952	4.53	4.50	4.56	4.57	4.64	4.61	4.65	4.60	4.60	4.61	4.55	4.51
1953	4.60	4.61	4.60	4.60	4.62	4.68	4.76	4.85	4.84	4.86	4.86	4.87
1954	4.87	4.84	4.83	4.81	4.81	4.77	4.75	4.74	4.76	4.72	4.68	4.72
1955	4.72	4.71	4.73	4.72	4.72	4.71	4.74	4.78	4.74	4.79	4.81	4.80
1956	4.79	4.80	4.81	4.81	4.80	4.82	4.87	4.89	4.93	5.00	5.12	5.14
1957	5.26	5.39	5.47	5.52	5.48	5.49	5.48	5.47	5.52	5.60	5.64	5.67
1958	5.67	5.69	5.66	5.63	5.57	5.50	5.49	5.45	5.38	5.38	5.43	5.51
1959	5.52	5.59	5.60	5.62	5.64	5.67	5.68	5.73	5.74	5.81	5.94	5.97
1960	6.01	6.04	6.06	6.06	6.09	6.08	6.10	6.09	6.07	6.07	6.03	6.01
1961	6.02	5.96	5.94	5.85	5.83	5.81	5.78	5.77	5.79	5.76	5.74	5.75
1962	5.74	5.76	5.78	5.78	5.76	5.71	5.68	5.66	5.66	5.66	5.65	5.64
1963	5.61	5.61	5.55	5.54	5.51	5.53	5.53	5.48	5.52	5.51	5.48	5.50
					Federal Home Loan Bank Board[b]							
1962												5.66
1963	5.59	5.59	5.55	5.51	5.57	5.53	5.55	5.51	5.51	5.51	5.49	5.52
1964	5.53	5.42	5.48	5.47	5.46	5.48	5.49	5.47	5.49	5.49	5.47	5.53
1965	5.49	5.53	5.48	5.47	5.50	5.49	5.47	5.47	5.50	5.53	5.55	5.54
1966	5.62	5.63	5.74	5.93	5.96	6.11	6.16	6.32	6.39	6.39	6.55	6.47
1967	6.39	6.49	6.23	6.32	6.22	6.23	6.32	6.28	6.37	6.37	6.32	6.44

[a]Covers four large companies during 1951 – 63, and one company during 1948 – 50. Contract rate adjusted for net fees paid and received, assuming prepayment in ten years.

[b]Covers forty-four companies. Contract rate on loans secured by newly built homes only.