Volume Title: Essays on Interest Rates, Volume 1

Volume Author/Editor: Jack M. Guttentag and Phillip Cagan, eds.

Volume Publisher: NBER

Volume ISBN: 0-87014-201-1

Volume URL: http://www.nber.org/books/gutt69-1

Publication Date: 1969

Chapter Title: The Behavior of Residential Mortgage Yields Since 1951

Chapter Author: Jack M. Guttentag

Chapter URL: http://www.nber.org/chapters/c1208

Chapter pages in book: (p. 29 - 76)

2

The Behavior of Residential Mortgage Yields Since 1951

Jack M. Guttentag

This chapter reports some selected findings drawn from a study of the behavior of residential mortgage interest rates in the period since 1951. The findings reported here are based in part on new monthly and quarterly time series on residential mortgage rates and terms drawn from the internal records of some large life insurance companies.[1] These new data have a combination of important attributes heretofore not available in any single series.

First, the date of record is the date when loans were committed or authorized by lenders, rather than the date on which funds were disbursed. Hence the long and erratic lag characteristic of a series recorded on a disbursement basis is largely eliminated.

Second, the data cover all three types of residential mortgages (FHA, VA, and conventional); separate series are also available on mortgages acquired through correspondents as opposed to those originated directly by life insurance companies.

Third, the data include loan-value ratios and maturities, as well as fees and charges collected and paid by the lender over and above the contract rate. The contract rate, adjusted to take account of net fees

NOTE: This is a revised draft of a paper presented at a joint meeting of the American Real Estate and Urban Economics Association and the American Finance Association in San Francisco, California, on December 27, 1966. I am indebted to Phillip Cagan, Avery Cohan, and Richard Selden for helpful comments.

[1] The larger study upon which this paper is based, prepared in collaboration with Morris Beck, "New Series on Residential Mortgage Yields Since 1951," will provide a more detailed discussion of the technical features and analytical characteristics of these data, along with the series themselves.

and charges received by the lender, is referred to as "effective yield" or simply "yield."[2]

Fourth, the data have a broad geographic base, since the lenders covered by the series operate nationwide.

These new series are supplemented by data on FHA mortgages provided by that agency, and on FHA and VA mortgages provided by the Federal National Mortgage Association. These are sometimes referred to as "secondary market" series, since they are based on transactions covering more or less completed mortgages for "immediate delivery";[3] in contrast, the National Bureau series is based on a commitment, which implies delivery of the mortgage sometime in the future. I have also used new series on conventional mortgages compiled by the Federal Home Loan Bank Board beginning in December 1962.[4]

The paper is divided into six sections. Following the summary, there are three sections on the relationship between mortgage yields and bond yields, and two sections on relationships between FHA, VA, and conventional mortgage yields.

Summary and Conclusions

The new commitment data show that for the period prior to 1961 conventional mortgage yields had a narrower cyclical amplitude than high grade bond yields. The new data thus confirm the findings of earlier investigators, but they do not support the various hypotheses advanced

[2] The effective yield is determined by the following factors: contract rate, fees and charges expressed as a per cent of the loan amount, face maturity, method of repayment (most home mortgages are on uniform monthly payment basis), and actual life (most mortgages are prepaid in full prior to maturity). The *Mortgage Yield Table* published by the Boston Financial Publishing Company shows the yield on uniform monthly payment mortgages for various combinations of these variables. Except where indicated otherwise, all effective yields referred to in this paper are based on the assumption of uniform monthly payments and prepayment in full after ten years.

[3] The FHA series are based on opinions of FHA insuring office directors regarding the prices prevailing in their areas. The FNMA quotations are based on sales reported by mortgage companies, mainly to life insurance companies and mutual savings banks, and may include commitments as well as over-the-counter purchases. FNMA quotations are said to be adjusted to a common service fee.

[4] These series are based on the date of the approval of a borrower's loan application, which is the same as the date of authorization, except in cases where commitments are given to builders. The Federal Home Loan Bank Board series used in this paper cover direct loans by life insurance companies secured by newly built homes.

by them to explain this phenomenon. The relatively narrow cyclical amplitude of mortgage yields, at least on loans by life insurance companies, is not due to failure to allow for cyclical changes in fees and charges. Nor does the evidence suggest that cyclical yield variability is dampened by variability in loan-value ratios and maturities, in borrower characteristics affecting risk, or in the composition of loan aggregates by region or by individual lender. The hypothesis that relatively high origination costs dampen mortgage yield variability is another one which does not withstand close scrutiny. Cyclical changes in risk premiums could play a role in dampening mortgage yield amplitude relative to that of bonds, but most of the available evidence suggests otherwise.

The hypothesis suggested here is that the narrow cyclical amplitude of mortgage yields relative to bond yields reflects differences in market organization. Yields tend to be less volatile in negotiated markets where the borrower and the lender are in direct contact, than in dealer-type markets. Some of the reasons for this also underlie the tendency for mortgage yields to *lag* bond yields at cyclical turning points.

The new authorizations data confirm that mortgage yields tend to lag behind bond yields at cyclical turning points. This is not explained by the hypothesis that small changes in mortgage market conditions register first in such nonrate dimensions of mortgage loans as loan-value ratios, maturities or fees and charges. The evidence indicates that these characteristics may be even less sensitive than the contract rate. The hypothesis suggested to explain the lag in mortgage yields is that the basic demand for mortgage credit is relatively stable and that short-run developments affecting general yield levels ordinarily originate in the bond markets. The transmission of bond yield changes to the mortgage market is entirely dependent on the activities of the primary lenders (there is no dealer arbitrage). Since these lenders respond only to what they consider pervasive movements in bond yields, which must prove out over time, the transmission process takes time and mortgage yields lag. The transmission lag may account in part for the smaller cyclical amplitude of mortgage yields than of bond yields, since the lag prevents the full range of bond yield changes from being transmitted to the mortgage market.

The 1961–66 behavior of mortgage yields, however, represents a sharp break with past patterns. During the long stretch of easy money extending from 1961 to 1965, mortgage yields continued to decline far beyond the lower turning point of bond yields. Then as tight money emerged in 1966, mortgage yields rose with unprecedented rapidity.

In contrast to the prior three cycles, the amplitude of conventional mortgage yields (measured in basis points) was comparable to that of bonds in both phases of the 1961–66 cycle.

Structural changes affecting the commercial banking system may have been largely responsible for this. During 1961–66, commercial banks underwent a marked shift in policy toward time deposits. With their secondary reserves of government securities largely depleted, time deposits became a valuable source of funds over which commercial banks could exercise some degree of control. The importance of time deposits in the bank liability structure, which had been growing steadily for some time, accelerated markedly. The higher deposit costs and reduced liquidity requirements associated with time deposits encouraged a portfolio shift into relatively high-yielding mortgages. This shift put added downward pressure on mortgage yields during the easy money period of 1961–65.

When tight money emerged in 1966 banks did not withdraw wholesale from the mortgage market as they had in earlier periods of restraint; probably, because by then many banks considered mortgages a permanent part of their portfolios. Under the same pressures to meet business loan demands as in earlier periods of restraint, the banks had no buffer of government securities to liquidate. As a result they competed for time deposits with unprecedented aggressiveness and considerable success, in good part, at the expense of savings institutions which invest most of their funds in mortgages. Whereas government securities liquidation in earlier periods had dispersed market pressures rather widely, the withdrawal of funds from savings institutions impinged directly on the mortgage market and resulted in an unprecedented rise in mortgage yields.

There is some indication that the yield advantage of conventional over FHA mortgages declined secularly over the period 1949–66. Presumably the decline reflected favorable repayment experience over the period, which would have reduced *ex ante* risk premiums on conventional loans.

The conventional-FHA yield differential does not show any systematic cyclical pattern. During two periods of extreme credit stringency, in late 1959–60 and 1966, FHA mortgages came to yield appreciably more than conventional ones, however. This appears to be a real market phenomenon rather than a statistical accident; it shows up in data covering individual lenders, and in data for individual states—both states with low usury ceilings and states with high or no ceilings. One explanation is that those mortgage lenders who prefer

FHAs to conventionals are sensitive to yield differentials between mortgages and bonds and shift out of mortgages when capital markets become very tight. Mortgage lenders who prefer conventionals are willing to absorb the overhang of FHAs only at premium rates.

At various times, FHA mortgages have carried a higher contract rate than VAs, and this has affected their relative yield. Prior to mid-1952, FHAs and VAs carried premiums. Under these conditions FHAs, having a higher contract rate, carried higher yields. This probably resulted from the risk aversion of conservative lenders to the uncertainty associated with realized yield when mortgages sell above par. (The yield realized on a mortgage that is not priced at par depends not only on the contract rate and the size of the premium or discount, but also on the life of the mortgage which is not known in advance. Most mortgages are prepaid in full well before maturity.) When mortgages carry premiums yield is an increasing function of mortgage life and may be very low, even zero or negative, if the mortgage is paid off soon after origination. An over-estimate of mortgage life can thus have a seriously adverse effect on realized yield. If the market is dominated by conservative lenders, concerned with the "worst that can happen," the premium paid on a high contract rate mortgage will not be large enough to provide a yield equal to that on a low contract rate mortgage when yields are calculated on the basis of any reasonable estimate of expected life.

During 1957–61 FHA contract rates were again higher than VAs, but in this period both carried discounts. When mortgages carry discounts, yield is a decreasing function of life and the lowest possible yield, realized if the mortgage runs to maturity, is not much lower than the yield based on its expected life. Hence, yield uncertainty associated with uncertainty regarding mortgage life probably does not have much influence on the relative yields of mortgages carrying different contract rates.

Discounts raise public relations problems, however, particularly with regard to larger lenders in the public eye such as the life insurance companies covered by our interest rate study. These lenders, sensitive to public censure, took discounts on VAs that were smaller than those necessary to equalize the yield with the higher contract rate FHAs, but they sharply reduced their VA volume. Hence, for these lenders FHAs yielded more than VAs. Data provided by FNMA reveal, however, that in the "free" market where discounts on VAs rose to the level needed to clear the market, VAs yielded more than FHAs. It is ironical that the public pressures on large institutions to limit discounts on VA

mortgages, by causing them to sharply reduce their VA volume, had the effect of increasing pressure on VA discounts in the free market.

There are indications, however, that during 1958–59 life insurance company attitudes toward discounting began to change in that they began to accept the discounts required to bring VA yields into an appropriate relationship to FHA yields. By 1961 the mortgage market had evidently learned to live with discounts.

Cyclical Amplitude of Mortgage Yields and Bond Yields

In an earlier study, Klaman noted that conventional mortgage interest rates have a smaller cyclical amplitude than bond yields.[5] The same observation was made earlier by Grebler, Blank and Winnick.[6] Although Klaman's data were recorded on the disbursement date, which tends to dampen amplitude,[7] the observation also applies to mortgage yields recorded on an authorization basis. As shown in Table 2-1, 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 U.S. government bonds, outstanding corporate bonds (both Aaa and Baa), and outstanding state and local bonds (both Aaa and Baa). (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 in this paper.) Cyclical changes expressed in terms of percentage changes in yields would show even more marked differences in amplitude because of the higher absolute level of mortgage yields.

There are several possible explanations for the relatively narrow cyclical amplitude of mortgage interest rates. First, the data used by earlier investigators did not take account of fees and charges received or paid by lenders over and above 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

[5] Saul B. Klaman, *The Postwar Residential Mortgage Market*, Princeton for NBER, 1961, pp. 75–78.

[6] Leo Grebler, David M. Blank and Louis Winnick, *Capital Formation in Residential Real Estate: Trends and Prospects*, Princeton for NBER, 1956, p. 223.

[7] 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.

TABLE 2-1. 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. Govt. Long-Term	Corporate		State & Local	
	Conventional (1)	FHA (2)	(3)	(4)	Aaa (5)	Baa (6)	Aaa (7)	Baa (8)
1949–51 D	−10	−20	−28	−26	−27	−37	−63	−97
1951–53 R	56	62	85	94	83	72	134	168
1954 D	−15	−11	−33	−66	−53	−43	−74	−73
1954–58 R	97	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	47	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

SOURCE: Col. 1 and 2, data supplied to NBER in a survey of life insurance companies and to appear in a forthcoming publication, plus Federal Home Loan Bank Board; col. 3, FHA; col. 4, Federal Reserve System; cols. 5, 6, 7, 8, Moody's.

NOTE: Dates refer to years containing turning points in conventional mortgage series. Cyclical changes are measured between peaks and troughs of each series. Averages are calculated without regard to sign.

na = not available.

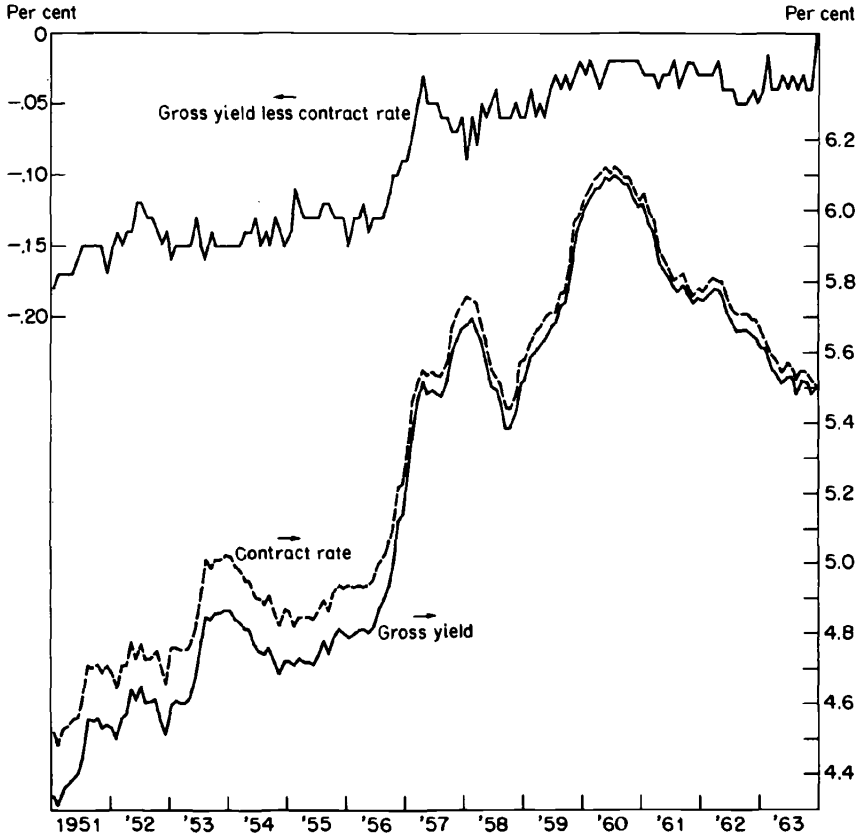
mortgage market."[8] Furthermore, an a priori argument for cyclical sensitivity in fees and charges is that local institutions would feel less comfortable about raising rates than about raising fees and charges. The going rates on mortgages in any given area are widely known, while fees and charges are not.[9]

The new authorization series, which take account of 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 2-1 which shows effective yield, contract rate, and the difference between them. (Note that the difference

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

[9] I owe this point to Avery Cohan.

CHART 2-1. Gross Yields and Contract Rate on Conventional Loans, 1951–63



is on an enlarged scale.) It is clear that virtually all cyclical variability in conventional yields stems from variability in the contract rate.

Whether fees and charges are cyclically insensitive for lender groups other than life insurance companies is not clear. Federal Home Loan Bank Board data covering the period of marked rate increase, September–October 1965 to December 1966–January 1967, suggest that cyclical changes in fees and charges may be significant for savings and loan associations and, perhaps, commercial banks. During that period, the average effective yield on new-home loans approved by savings and loan associations rose by about 68 basis points, the increase in fees and charges accounting for about 10 basis points and the increase in contract rate for the balance. For commercial banks, the rise in fees ac-

counted for 5 basis points of a 76 point rise in yield. For the three other lender groups—life insurance companies, mortgage 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; and the Board's definition of fees and charges is not comprehensive.[10]

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 fact that fees and charges are infinitely divisible while lenders very seldom write loans at contract rates that are not multiples of $\frac{1}{4}$ 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 $5\frac{1}{2}$ per cent rate, are jumped to $5\frac{3}{4}$ per cent, the others remaining unchanged.

A second possible explanation of the relatively narrow cyclical amplitude of conventional mortgage yields was suggested by Klaman.

> 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 record-keeping, perhaps 75 basis points compared to 10 on corporate securities, create a relatively stable state in residential mortgage interest rates.[11]

This reasoning is not convincing. Since mortgage rates at their lowest levels are several times higher than mortgage costs, it is not clear just how these costs dampen rate variability. Even if there is such a rate-dampening mechanism, which is not yet understood, 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 65 basis point cost differential mentioned by Klaman.

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

[11] Klaman, p. 78.

A third explanation, also suggested by Klaman, is that adjustments 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 . . .[12]

This argument is illustrated in the upper panel of Figure 2-1. 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.

Examination of cyclical variability in the mix of available loan characteristics helps to test this hypothesis. Table 2-2 shows that cyclical variability was negligible for loan-value ratios and maturities on conventional mortgages by life insurance companies during the 1951–63 period. For example, during the 1954 period of declining yields, the average maturity on conventional loans rose by sixteen months and the loan-value ratio by only two-tenths of a percentage point. Cross-section regression analysis (not shown here) suggests that such increases would affect yields by less than .01 per cent.

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. It has been found that a larger proportion of commercial bank business loans are to prime borrowers at interest rate peaks than at troughs; and that this tends to dampen variability in average business loan rates.[13] There is no evidence of a

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

[13] 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.

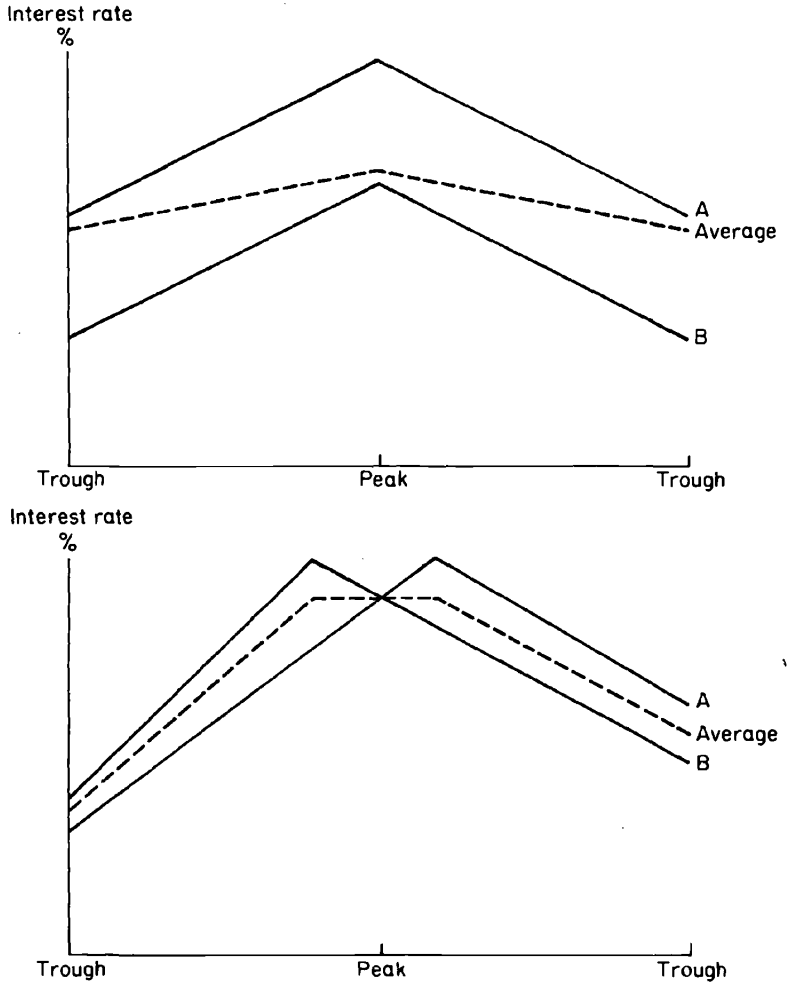


FIGURE 2-1. Interest Rate Adjustments to Cyclical Change

similar tendency in the case of conventional mortgage loans by life insurance companies, however. The only measure of borrower risk available from the time series is the average property value underlying the series.[14] Trend-adjusted cyclical fluctuations in average property

[14] 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 regressed separately on property value and income, coefficients are negative for both and always larger for value;

TABLE 2-2. Changes in Maturities and Loan-Value Ratios During Periods of Cyclical Rise and Decline in Mortgage Yields, 1953–63

	1951–54		1954–58		1958–60		
	Change	Per Month	Change	Per Month	Change	Per Month	Average Per Month
Part A: Periods of Rise in Yields							
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
Part B: Periods of Decline in Yields							
	1954	Per Month	1958	Per Month	1960–63	Per Month	Average 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	.00	.00	.01
FHA	.60	.04	1.50	.24	1.60	.04	.06
VA	1.90	.13	7.20	1.20	−1.40	−.03	.12

SOURCE: Data supplied to NBER in a survey of life insurance companies and to appear in a forthcoming publication.

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.

value are in the wrong direction. Values rose considerably faster during the three periods of declining yields, 1951–66, than during the four periods of rising yields, thus tending to *increase* cyclical amplitude rather than dampen it.[15]

Applying the shift-in-mix hypothesis to shifts in lender and geographical mix is potentially more promising, since these are the most important sources of yield variability on a cross-section basis. To test whether shifts in the geographical and lender mix affected cyclical yield variability, conventional yields for each turning-point quarter were recalculated on the assumption that loan distribution among thirty-six separate strata—four lenders and nine regions—was the same as in the previous turning-point quarter. The results, shown in Table 2-3, indicate that cyclical changes in lender and geographical mix also have a negligible effect on over-all cyclical yield variability.

TABLE 2-3. Cyclical Changes in Conventional Mortgage Yields at Current and Fixed Lender and Regional Weights, 1951–63

Cyclical Rise (R) or Decline (D)	Current Weights	Fixed Weights
I 51 to I 54 (R)	.49 [a]	.48 [a]
I 54 to IV 54 (D)	−.15	−.14
IV 54 to I 58 (R)	.97	.94
I 58 to IV 58 (D)	−.23	−.19
IV 58 to III 60 (R)	.65	.65
III 60 to IV 63 (D)	−.59	−.60

SOURCE: Same as Table 2-2.
[a] Contract rate.

The change-in-mix hypothesis implies that FHA mortgage series should have greater amplitude than conventional series when they are measured on a comparable basis. Since cross-section yield variability

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.

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

is lower on FHAs than on conventionals and the mix of FHA yield determinants has less cyclical sensitivity (see Table 2-2), changes in mix might be thought to dampen yield variability less in FHAs. In fact, the amplitude of the FHA authorization series is not significantly different from that of the conventional authorization series (see Table 2-1).

The fourth explanation of the problem is that the relatively narrow cyclical amplitude of mortgage yields arises from greater differentiation within the mortgage category which causes differences in cyclical phasing among the various components of the aggregate. (This is illustrated in the lower panel of Figure 2-1.) 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 the amplitude 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, however, implies that high-grade bond yield series 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 2-1 shows that this is not the case for either bonds or mortgages.

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 risk premiums between mortgages and bonds will be smaller at cyclical peaks, which are associated with high levels of business activity, than they are at troughs. Conventional mortgages are generally riskier than high-grade bonds and, when economic conditions become increasingly favorable, risk premiums narrow more on riskier instruments. To put it somewhat differently, the quality of conventional mortgages improves more than does that of high-grade bonds during periods of economic expansion.

This hypothesis may be tested indirectly. If a decline in risk premiums accounted for the reduction in yield differentials between conventional mortgages and high-grade bonds during business expansions, similar reductions should also have occurred as between high-grade and low-grade bonds, and between FHA and conventional mortgages. A comparison of yield differentials at business cycle peaks and troughs does not support this hypothesis, as Table 2-4 shows. The difference in

TABLE 2-4. Yield Differentials at Business Cycle Peaks and Troughs

Yield Differential	Average of 3 Reference Cycle Peaks	Average of 3 Reference Cycle Troughs	Difference: Troughs Less Peaks
Conventional mortgage			
less Aaa corporate	1.53	1.86	.33
less Aaa state and local	2.42	2.86	.44
Aaa corporate less Baa corporate	.71	.83	.12
Aaa state and local less Baa state and local	1.04	1.01	−.03
Conventional mortgage less FHA mortgage	.05	−.01	−.06

SOURCE: Appendix Table.

the conventional mortgage-high-grade bond yield differential at reference cycle peaks and troughs was significant at the 1 per cent level, while the other differences are not significant (in two cases they have the wrong sign).[16]

This test, however, depends heavily upon the assumption that lender reevaluations of security risk can be tied to reference cycle turning points. Another test—cruder but perhaps more meaningful in

[16] Avery Cohan's paper on the quality of directly placed bonds points out that changes in the yield differential are not a perfect proxy for changes in "quality" if quality is defined in terms of 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 risk security will be $(1 + r)p$, where r is the contract rate on the risk security and p is the probability that the principal and interest will be paid. Since the risk premium included in r is by hypothesis 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 by even more to maintain a constant p. The risk premium expressed in terms of 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 of the general order of magnitude shown in the Appendix Table would require a rise of 2–3 basis points in the conventional mortgage-Aaa bond yield differential in order to maintain a constant risk premium.

light of our ignorance on this point—compares average yield differentials during recession periods with averages during expansions. This test is more favorable to the risk premium hypothesis. As shown in Table 2-5, the yield differential between Aaa and Baa issues of

TABLE 2-5. 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		Conventional Less FHA
	Corporate	State and Local	
(R) Nov. 48–Oct. 49	75	102	8
(E) Nov. 49–June 53	57	85	24
(R) July 53–Aug. 54	62	109	9
(E) Sept. 54–June 56	50	97	10
(R) July 57–April 58	98	108	4
(E) May 58–April 60	75	94	−8
(R) May 60–Feb. 61	79	96	−11
(E) March 61–July 67	57	53	−4

SOURCE: Same as Appendix Table.

corporate and of state and local bonds 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 such pattern was evident, however, for the yield differential between conventional and FHA mortgages.

Cyclical changes in mortgage delinquencies are perhaps even more relevant. One would not expect a recession to raise the *ex ante* risk premium on conventional mortgages if the repayment experience on mortgages held in portfolio was not appreciably affected by the recession. The evidence on delinquencies, by and large, does not support the risk premium hypothesis. For major lender groups, including life insurance companies, there has been a modest tendency for delinquencies to rise during recent recessions, but this appears to be accounted for entirely by FHA and VA mortgages.[17] A study of monthly

[17] Some of the evidence on this is shown in James S. Earley, "The Quantity of Postwar Credit in the United States," NBER, September 1965 (mimeograph). A complete compendium of delinquency and foreclosure series is listed in Edgar R. Fiedler with the assistance of Maude R. Pech, "Measures of Credit Quality," NBER, July 1967 (mimeograph).

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

The final hypothesis considered here is that the narrow cyclical amplitude of mortgage yields relative to bond yields reflects differences in market organization. It can be argued that, for a number of reasons, rates tend to be relatively sluggish in negotiated markets where borrowers and lenders are in direct contact, as opposed to impersonal dealer-type markets. First, negotiated markets involve some bilateral bargaining which will moderate changes in rates if there is any 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. Concern for maintaining relationships over the long run blunts the tendency to maximize market position in the short run.

Second, lenders in negotiated markets are likely to have heavy, nontransferable overhead costs geared to the specific market, as in the case of life insurance companies that acquire mortgages through their own network of branch offices. Such lenders find it profitable to maintain stable rates in those markets.

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 this hypothesis goes beyond our immediate focus 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 commercial bank business loan rates than of rates on open market paper of comparable maturity.[18] It is also of interest that the FHA secondary market yields series is more volatile than FHA authorization series though less volatile than bond yields (Table 2-1). The market organization underlying the FHA secondary market lies somewhere between the organization of the markets underlying

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

the life insurance company authorization series and that underlying the bond yield series.[19]

Lag of Mortgage Yields Relative to Bond Yields at Turning Points

Klaman noted that "Changes in mortgage interest rates lagged continually behind changes in bond yields throughout the postwar 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 2-6 indi-

TABLE 2-6. Lag at Turning Points, Conventional Mortgage Yields Relative to Bond Yields (*months*)

	Turning Point in Conventional Yields	U.S. Govt. 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
"Normal"	(T) Nov. 1954	4	1	8	−2
"Normal"	(P) Feb. 1958	4	5	3	3
"Normal"	(T) Oct. 1958	6	4	4	3
"Normal"	(P) July 1960	6	6	10	5
	(T) Sept. 1965 [b]	53	30	32	6
	1954–60 Average	5	5	7	3

SOURCE: Same as Table 2-2, plus Federal Reserve System, Moody's.

[a] Based on data for one company.

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

cates. At five turning points during the 1954–60 period, conventional yields lagged government bond yields by 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 be-

[19] Thus, there are no dealers in the FHA secondary market but brokers are often used, and buyers and seller tend to canvass the market for the best available deal on any given day.

[20] Klaman, p. 78.

tween mortgage and bond yields. The 1965 case will be discussed below.[21]

Since the dating of turning points is sometimes unavoidably arbitrary, another measure of cyclical sensitivity is employed in Table 2-7.

TABLE 2-7. 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)	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	−16	−4	+7	+5
	+8	−55	−36	−30	+5	−3
	+12	−48	−29	−40	−1	−8

SOURCE: Same as Table 2-6.

This table uses only one turning point—that 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 (or decline)

[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.

during the periods following troughs (or peaks) in government bond yields.[22] These comparisons show mortgage yields 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, these bond yields were up 80 basis points, high-grade corporates were up 50–54 basis points, while direct conventional mortgage yields were up only 1 basis point.

One hypothesis used to explain the lag in conventional mortgage yields suggests 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 will reach a cyclical turning point before yields. Table 2-8 shows cyclical turning points in loan-value ratios and maturities corresponding to turning points in yields (taken from the new NBER series, 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. Terms led yields at eight turning points; terms lagged behind in five cases; in nine cases, the turning points in terms were within one month of the turning point in yields. If these were independent observations, an 8–9–5 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 not in fact independent, it is useful to view this evidence in another way, by taking 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 behind yields at the other four turning points, although the 1953 turning point has only one valid observation.

[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 most recent trough is not included in this table because the trough dates are dispersed over an extraordinary long period in the different series.

[23] Furthermore, as shown in Table 2-6, the lag of mortgage yields behind bond yields at this turning point was shorter than usual, whereas the sensitivity-of-terms hypothesis used to explain this lag implies that it should have been longer.

TABLE 2-8. 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 [c]
Gross Yield								
FHA and VA	Nov. 53	Feb. 55	March 58	Sept. 58	March 60			
Conventional	Jan. 54	Nov. 54	Feb. 58	Oct. 58	July 60			
All, weighted	Dec. 53	Oct. 54	Feb. 58	Oct. 58	May 60			
	Cyclical Troughs and Peaks in Terms [b]							
	T	P	T	P	T			
Conventional								
Maturity	Nov. 53	Dec. 54	Aug. 56	Jan. 59	March 61	2	2	1
Loan value	ntp	ntp	Aug. 57	Sept. 59	ntp	1	1	
FHA								
Maturity	June 53 [a]	May 55	Feb. 57 [a]	Sept. 58	ntp		1	1
Loan value	July 54 [a]	June 55	Jan. 57 [a]	Sept. 58	ntp		1	1
VA								
Maturity	May 53 [a]	Dec. 54	Jan. 57	ntp	ntp	2		
Loan value	Aug. 53 [a]	Oct. 54	ntp	ntp	ntp	1		
All, weighted								
Maturity	Aug. 52 [a]	Oct. 54	Sept. 57	Dec. 59	Dec. 60	1	2	1
Loan value	Aug. 52 [a]	Oct. 54	Aug. 57	Dec. 59	Dec. 60	1	2	1

SOURCE: Same as Table 2-2.

ntp = No well-defined turning point.

[a] Affected by changes in legal limits.

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

[c] Within one month of corresponding yield series.

The new FHLBB series on conventional loans provide additional evidence to test the theory that sensitivity in terms retards adjustments in rates. Although, as yet, these data cover only one turning point, series are available for five lender groups, separately for new and existing properties, or ten cases for each loan characteristic. For maturities there were eight identifiable turning points which lagged the turning point in their respective contract rate in every case (Table 2-9). Similarly, six identifiable turning points in loan-value ratio all lagged their respective contract rate. Thus, the data do not support the hypothesis that sensitivity in terms retards adjustments in yields at cyclical turning points.

TABLE 2-9. Leads and Lags of Loan-Value Ratios, Maturities, and Fees and Charges Relative to Contract Rate at the 1965 Contract Rate Trough 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	8	0	8	0
Loan-value	6	0	6	0
Fees and charges	6	1	4	1

SOURCE: Federal Home Loan Bank Board.

[a] Within one month of corresponding rate series.

Neither is the lag in conventional yields explained by a 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 in most cases (Table 2-9).

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 behind bond yields. The basic demand for mortgage credit 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

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

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 reasons there is virtually no arbitrage between the bond market and the mortgage market.[26] Rate adjustments in the mortgage market depend almost entirely upon the activities of primary lenders. These lenders appear to be responsive to pervasive changes in bond yields, though not to short-lived ones. As one lender expressed it, "To attempt to follow every wiggle in bond yields would unduly disrupt our market relationships." However, a pervasive movement in bond yields cannot usually 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 the relatively stable mortgage credit demand, may be partly responsible for the narrow cyclical amplitude of mortgage yields.

Longer-Run Changes in the Relationship of Conventional Mortgage Yields to Bond Yields and the 1961–66 Experience

The relationship between conventional mortgage yields and high-grade bond yields is examined in two ways. Chart 2-2 shows the yield differential (mortgages less long-term government bonds), monthly during the period 1948–66. This series is affected by the tendency of mortgage yields to lag bond yields by periods of varying length. Table 2-10 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 government bonds in January 1960. These are referred to as "matching differentials."

During the period 1949–60, the monthly series shows marked

[25] See Jack M. Guttentag, "The Short Cycle In Residential Construction," *American Economic Review*, June 1961, pp. 292–294.

[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 I do not know of 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.

CHART 2-2. Conventional Mortgage Yields and Long-Term Government Bond Yields, 1948–67

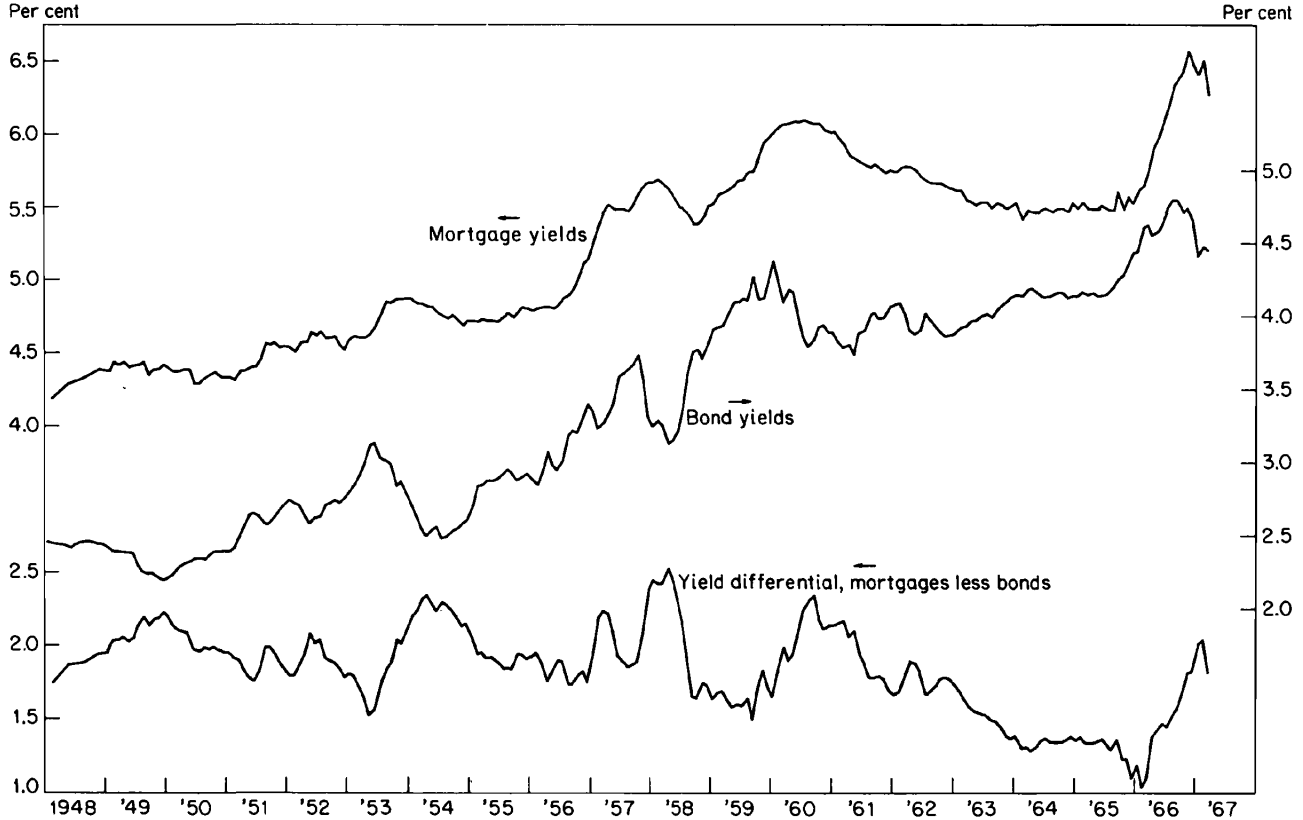


TABLE 2-10. Yield Differentials Between Conventional Mortgages and Bonds, at Cyclical Peaks and Troughs

	Dates					Yield Differentials				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
				Part A: Cyclical Peaks						
Conventional Mortgages	Dec. 49 [a]	Jan. 54	Feb. 58	July 60	Nov. 66					
U.S. Govt. Long Term	Oct. 48	June 53	Oct. 57	Jan. 60	Sept. 66	1.96	1.74	1.96	1.73	1.77
Corporate Aaa	Nov. 48	June 53	Sept. 57	Jan. 60	Sept. 66	1.59	1.47	1.57	1.49	1.07
Corporate Aa (New)		May 53	Oct. 57	Sept. 59	Dec. 66		.99	.78	.62	.63
Corporate Baa	Dec. 48	Sept. 53	Nov. 57	Feb. 60	Dec. 66	.90	.99	.60	.76	.38
				Part B: Cyclical Troughs						
Conventional Mortgages	Feb. 51	Nov. 54	Oct. 58	Oct. 65						
U.S. Govt. Long Term	Dec. 49	July 54	April 58	May 61		2.09	2.21	2.26	1.77	
Corporate Aaa	Jan. 50	Oct. 54	June 58	March 63		1.74	1.81	1.81	1.31	
Corporate Aa (New)		March 54	June 58	Jan. 63		–	1.77	1.57	1.30	
Corporate Baa	Feb. 51	Jan. 55	July 58	March 65		1.15	1.23	.85	.72	

SOURCES: 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 Board series; Corporate bond series are from Moody's.

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

[a] Based on data for one company.

cyclical fluctuations with some indication of widening amplitude, but there is no indication of trend. Similarly, the matching differentials at the first three troughs and four peaks show no indication of trend.

During the cyclical decline in yields that began in 1960, however, mortgage yields continued to fall long past the point at which bond yields began to drift upward.[27] 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 45–48 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 was done 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 during any earlier cyclical rise, and it brought the differential back to high levels, although still below earlier peaks. Thus it appears less certain now than it did at the end of 1965 that a permanent decline in the differential has occurred. What needs explaining is the amplitude of the yield differential, greater throughout the period 1961–66 than in earlier periods, which reflects the increased amplitude of the mortgage yield series during this period.

The hypothesis offered here to explain the wide amplitude of mortgage yields during 1961–66 takes the following crude "facts" as a point of departure. In the 1961–65 period of decline in mortgage yields, net mortgage acquisitions on one- to four-family properties rose to $72.3 billion from $65.7 billion in the preceding six years, or rose 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

[27] The dispersion of turning points in various yield series at trough 4 is extremely wide, with several of the series showing multiple bottoms. While timing comparisons at this turning point are hazardous, the value of matching yield differentials is not significantly affected by the choice of turning point.

in the relative importance of time deposits in the bank liability mix, were responsible for the marked variability in mortgage yields during the 1961–66 period. The shift in the 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 were able to 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.[28]

The marginal value of time deposits to commercial banks has grown steadily over the last decade or so, while their government securities portfolios have trended downward. Beginning in the late 1950's and early 1960's, one bank after another found it could no longer rely on the liquidation of government securities to meet loan demand 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 cities. Both large and small banks began to compete vigorously with savings institutions for smaller accounts. Rate differentials between savings accounts at commercial banks and those at savings institutions narrowed; rate advertising increased in intensity; and, probably, elasticity of substitution rose.

Table 2-11 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 1961–66 cycle, relative to the two earlier cycles. Thus the ratio of time deposits to total deposits rose by .63 percentage points per quarter during the 1961–66 cycle, compared with increases of .27 points and .26 points in the two preceding cycles.

As their liability mix shifted toward time deposits, the asset pref-

[28] 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. Late in 1966 the System decided that competition for savings had gone so far as to threaten disaster to the residential sector, and the ceilings on some types of accounts were reduced.

TABLE 2-11. Measures of Change in Bank Liability Structure During Cycles in Mortgage Interest Rates, 1953–66

Mortgage Interest Rate Cycle	$\frac{TD_1}{D_1} - \frac{TD_0}{D_0}$ (1)	$\frac{TD_1 - TD_0}{TD_0} - \frac{DD_1 - DD_0}{DD_0}$ (2)	$\frac{TD_1 - TD_0}{D_1 - D_0}$ (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

SOURCE: Federal Reserve System, Flow of Funds Accounts.

TD = Time deposits

DD = Demand deposits

D = Total deposits

Subscripts 0 and 1 refer to beginning and end of period, respectively. Measures (1) and (2) show differences per quarter.

erences of commercial banks also changed. It is a traditional tenet of bank management that mortgages can be prudently acquired with funds obtained from time deposits.[29] 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.[30] 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.[31] In addition, time deposits are generally viewed as requiring smaller liquidity provision than demand deposits, so that asset structure can safely be made less liquid.

[29] 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.

[30] 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.

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

More direct evidence on this relationship, focusing on *changes* in mortgage holdings and *changes* in time deposits during the period under study, is provided by the following experiment. The percentage change in mortgage loans during the period from December 1960 to June 1964 was regressed on various combinations of deposit change for 416 member banks in the Philadelphia Federal Reserve District.[32] 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 sort of control, the same procedure was used to explain the percentage change in state and local securities, which the banks also acquired in substantial volume during this period, except that the equations 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 2-12.

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 those 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.[33]

Since mortgage acquisitions by individual banks were influenced by changes in their time deposits,[34] it can be inferred that mortgage

[32] I am 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.

[33] 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.

[34] 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, Feb. 1965, Tables A-1 and A-4.

TABLE 2-12. Regression Results Showing Relationship Between Changes in Real Estate Loans and in State and Local Securities, Held by 416 Member Banks, to Changes in Deposits, December 1960 to June 1964

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

NOTE: Dependent variables are: per cent change in real estate loans in real estate loan equations, and per cent change in state and local securities in state and local 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.

acquisitions by the banking system as a whole were boosted by the pronounced shift that occurred in the bank deposit mix. This supports the view that the sharp decline in mortgage yields during the 1961–65 period was due, at least in part, to the marked increase in time deposits 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 they did in earlier periods of restraint when mortgages were viewed more as "residual" assets. Indeed, commercial banks maintained a high level of mortgage acquisitions in 1966, as Table 2-13 shows.

This view, however, neglects the effect that more intensive bank competition for time deposits would have on inflows to savings institutions and on mortgage lending by those institutions. Although the

TABLE 2-13. Changes in Holdings of One- to Four-Family Residential Mortgages and in Time and Savings Deposits by Commercial Banks and Savings Institutions During Cycles in Mortgage Interest Rates, 1953–66 (*amounts in billions of 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 53–I 55	3.6	1.6	6.7	6.4	35
Rise II 55–IV 57	3.1	0.8	7.1	5.7	30
Decline I 58–III 58	9.2	1.5	8.8	6.9	51
Rise IV 58–I 60	1.4	1.1	8.5	7.7	14
Decline II 60–III 65	13.7	2.0	13.2	10.0	51
Rise IV 65–IV 66	14.3	2.1	8.4	4.4	63

SOURCE: Federal Reserve System, Flow of Funds Accounts.

NOTE: Savings institutions are mutual savings banks, savings and loan associations, and credit unions. Mortgages lead one quarter.

status of mortgages in bank portfolios has risen, they remain less attractive than 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 led to a corresponding reduction in mortgage lending by these institutions.[35] As shown in Table 2-13, the maintenance of bank mortgage lending did not begin to counterbalance the decline in lending by savings institutions losing funds to banks.[36]

[35] 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.

[36] Table 2-13 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 the two earlier cycles. In the earlier cycles, the net flow of savings and mortgages at savings institutions was about as large during the period of rising yields as it was 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, their time deposits and mortgage lending fell during tight money periods, while in the recent cycle both flows were maintained.

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 the yields on alternative investments. This pressure must have been more diffused and less intense than the withdrawal of funds from savings institutions, which invest most of their funds in mortgages. Government securities liquidation in earlier periods probably was absorbed by reductions in "idle balances," whereas the response of lenders such as life insurance companies to changes in the alternative investment yields probably was much more gradual than the response of savings institutions to a reduction in their inflows. A good case can be made that the change in the bank response to tight money, from an emphasis on reducing investments to an emphasis on increasing time deposits, has had the result of transmitting the effects of tight money to the mortgage market more promptly and fully than ever before.

Relationship Between FHA and Conventional Yields

Our new data permit an analysis of changes in the relationship between FHA and conventional yields over the cycle, and over the eighteen year period, 1949–66. The dotted line on Chart 2-3 covering 1951–63 shows the differential based on the new National Bureau series. The solid line covering the period 1949–66 is based on the FHA secondary market series, and three linked conventional series.[37] Table 2-14 shows yield differentials calculated at the specific cycle peaks and troughs in both series. Since the cyclical amplitude of FHA yields is sensitive to the prepayment assumption, the conventional-FHA yield differential in this table is computed on four different prepayment assumptions.

It would generally be expected that conventionals would carry higher yields than FHAs because the latter are virtually free of default risk. The risk on conventional loans made by life insurance companies, however, is quite small since these loans typically carry down payments of 25 per cent or more. (Largely for this reason conventional loans by life insurance companies typically are in the lower range of yields on conventional loans in general.) For some lenders the modest risk advantage of FHAs is more than counterbalanced by its disadvantages.

[37] The Bureau series is used for 1951–63, the FHLBB series covering loans by life insurance companies on new properties for 1964–66, and data on one company for 1949–50. Yields in this chart are calculated on a uniform prepayment assumption of ten years.

CHART 2-3. Yield Differential Between Conventional and FHA Loans, 1949–67

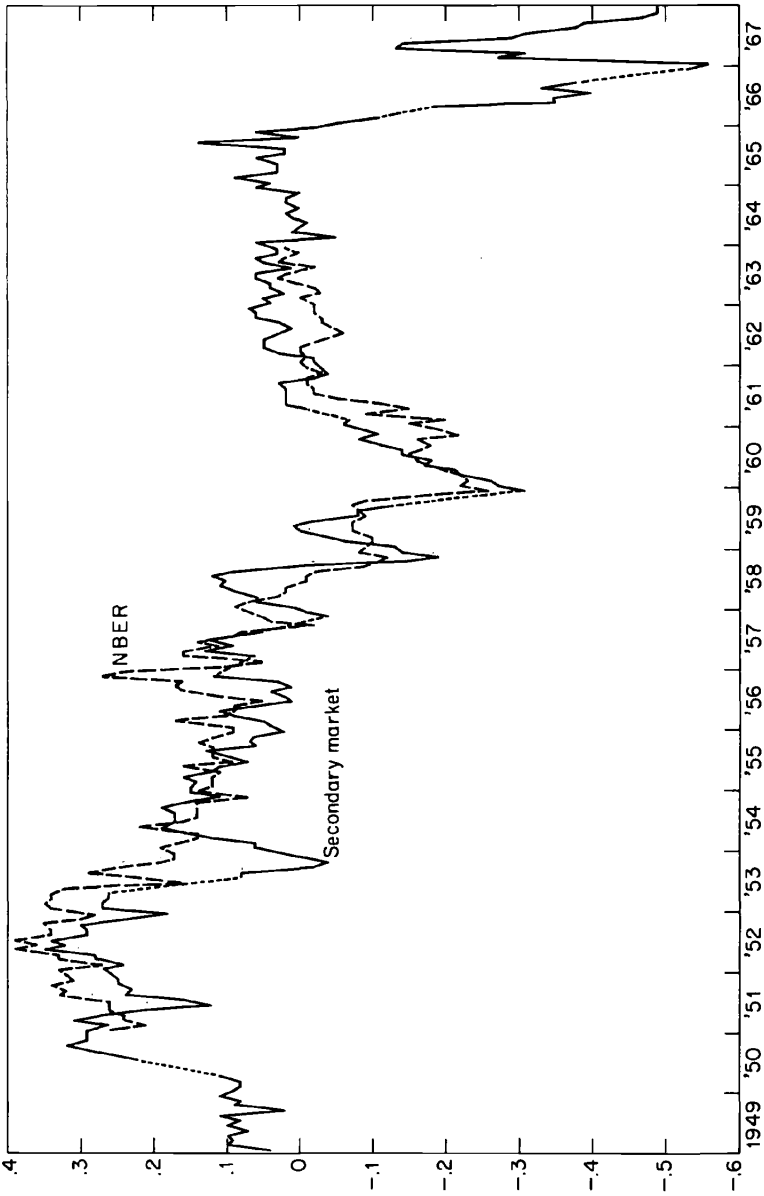


TABLE 2-14. Gross Yields on FHA and Conventional Mortgages at Specific Cycle Peaks and Troughs

Part A: Peaks

FHA	*Jan. 50* [a]	*Nov. 53*	*March 58*	*March 60*	*Dec. 66*
Contract rate	4.50	4.49	5.25	5.75	6.00
Discount (points)	−1.57	1.32	2.47	3.45	6.80
Effective yield—8 years	4.25	4.72	5.69	6.37	7.17
10 years	4.28	4.69	5.63	6.28	7.01
Half of maturity	4.28	4.68	5.58	6.20	6.80
Maturity	4.34	4.64	5.52	6.12	6.67
Conventional	*Dec. 49* [a]	*Jan. 54*	*Feb. 58*	*July 60*	*Nov. 66*
Contract rate	4.59	5.02	5.75	6.12	6.55
Discount (points)	−1.27	−.96	−.37	−.13	b
Effective yield—8 years	4.39	4.85	5.68	6.09	6.55
10 years	4.41	4.87	5.69	6.10	6.55
Half of maturity	4.41	4.87	5.69	6.10	6.55
Maturity	4.44	4.90	5.70	6.11	6.55
Conventional less FHA					
Effective yield—8 years	.14	.13	−.01	−.28	−.62
10 years	.13	.18	.06	−.18	−.46
Half of maturity	.13	.19	.11	−.10	−.25
Maturity	.10	.26	.18	−.01	−.12

Part B: Troughs

FHA	*Jan. 51*	*Feb. 55*	*Sept. 58*	*Aug. 65*
Contract rate	4.27	4.50	5.25	5.25
Discount (points)	−1.21	.61	1.45	1.40
Effective yield—8 years	4.06	4.60	5.51	5.48
10 years	4.08	4.59	5.47	5.45
Half maturity	4.09	4.58	5.44	5.42
Maturity	4.10	4.57	5.41	5.38
Conventional	*Feb. 51*	*Nov. 54*	*Oct. 58*	*Nov. 65*
Contract rate	4.48	4.82	5.44	5.50
Discount (points)	−1.20	−.83	−.33	b
Effective yield—8 years	4.29	4.66	5.37	5.50
10 years	4.31	4.68	5.38	5.50
Half maturity	4.32	4.68	5.38	5.50
Maturity	4.34	4.70	5.39	5.50
Conventional less FHA				
Effective yield—8 years	.23	.06	−.14	.02
10 years	.23	.09	−.09	.05
Half maturity	.23	.10	−.06	.08
Maturity	.24	.13	−.02	.12

NOTE: Data are based on NBER authorization series except for the 1966 peak and 1965 trough, which are based on the FHA secondary market series and the Federal Home Loan Bank Board conventional loan series.

[a] Data cover one company.

[b] Assumed equal to zero to maintain comparability.

FHA loans have somewhat higher origination costs because of the need to comply with the insuring agency's reporting and other requirements. Higher delinquency ratios on FHAs raise servicing costs while higher foreclosure ratios are also viewed unfavorably. While financial loss on foreclosed FHAs is quite small, most life companies prefer to avoid foreclosure for public relations and other reasons. In addition, conventional loans may carry prepayment penalties that are attractive to lenders, while borrowers can often be offered faster processing, and the ½ per cent insurance premium is avoided. The evidence indicates that conventionals have usually yielded more, but with some notable exceptions.

There is some suggestion in Chart 2-3 of a secular decline in the yield differential over the period 1952–59. Yields declined erratically, but persistently over this period. A secular decline might be expected from the favorable repayment experience on conventional mortgages, which would have reduced their risk premiums relative to federally underwritten mortgages.[38]

The yield differential rose during 1950–52, but for very special reasons. With FHA 4½ per cent mortgages carrying premiums, the maximum contract rate on these mortgages was reduced to 4¼ per cent in April 1950. Since premiums on high contract-rate mortgages are never large enough to reduce yields to the level of lower contract-rate mortgages (for reasons discussed in the next section), the reduction in contract rate also reduced FHA yields and raised the yield differential. The rise in yield differential during this period can be disregarded, therefore, as essentially reflecting an administrative action by the FHA. This strengthens the case for a secular decline.

The data do not reveal any tendency for the yield differential between FHA and conventional mortgages to change systematically over the cycle. Thus the average differential at the four peaks and three troughs covered by the authorization data is about the same, as shown at the top of page 64. However, Chart 2-3 shows that during two periods of extreme credit stringency—during late 1959–60 and during 1966—the yield differential fell sharply to the point where FHAs were yielding appreciably more than conventionals. What could account for this apparent aberration?

The most obvious possibility is that it is a statistical accident, arising from the lack of statistical comparability between FHA and

[38] An alternative hypothesis is that the liberalization of terms on conventional mortgages during this period kept pace with the increasingly sanguine views of lenders, so that no reduction in risk premiums occurred.

Conventional Less FHA Yields [a]

Prepayment	4 Peaks 1950–60	3 Troughs 1951–58
8 years [b]	−.01%	.05%
10 years [b]	.05	.08
One-half of maturity	.08	.09
At maturity	.14	.12

[a] Calculated from Table 2-14. [b] After the loan is closed.

conventional series. The most convincing evidence that this is not the case is that the phenomenon appears in data covering individual lenders, both in 1959 and in 1966. It also appears in data covering individual regions and states.

In some degree, the conventional loans acquired during a period of market tightness are of higher over-all quality than those acquired in more normal periods, as lenders limit themselves to the best risks. This might cause a *decline* in the yield differential but would not explain why FHAs come to yield more.[39]

A third possibility, suggested to me by market practitioners, is that usury laws in some states constrained the rise in yields on conventional loans more than on FHA loans. Discounting had become an accepted practice on FHAs by 1959, but on conventionals charges exceeding customary levels encounter borrower resistance and various kinds of institutional frictions.[40]

If this explanation was correct, we would expect to find rates on conventional mortgages rising more slowly, and the margin between FHA and conventional rates increasing most sharply in states with relatively low usury ceilings. In states with high or no ceilings, in contrast, conventional rates should rise enough so as to maintain a margin over FHAs. Data available on a state basis for the 1959–60 period of market stringency do not support this explanation. Table 2-15 shows that in the two year period ending in the first quarter of 1960 rates on conventional loans did not increase any more in three states with a 10 per cent usury ceiling than in three states with a 6 per cent ceiling.

[39] The decline would be small in any case, since life insurance companies do not change their risk standards on conventional mortgages very much in the short run.

[40] Many lenders are reluctant to charge discounts on conventional mortgages because of adverse public relations arising from complaints by borrowers that they had been forced to pay a usurious charge in disguise. Under the FHA program, only sellers are allowed by law to pay discounts. Even though this requirement is frequently violated by adjusting transactions prices, FHA approval provides the lender with a *prima facie* valid defense against the charge that the borrower paid the discount.

TABLE 2-15. Yields on FHA and Conventional Home Mortgages in Selected States, 1958 and 1960

State	First Quarter, 1958						First Quarter, 1960					
	FHA		Conventional			Conv. Less FHA (yield)	FHA		Conventional			Conv. Less FHA (yield)
	Yield	No. of Loans	Yield	Contract Rate	No. of Loans		Yield	No. of Loans	Yield	Contract Rate	No. of Loans	
6% Usury Law												
New York	5.39	10	5.58	5.64	48	.19	a	a	a	5.88	44	a
New Jersey	5.44	61	5.59	5.61	29	.15	6.04	10	5.94	5.94	43	−.10
Pennsylvania	5.44	69	5.48	5.57	43	.04	6.06	24	5.96	5.95	50	−.10
10% Usury Law												
California	5.65	55	5.70	5.83	245	.05	6.27	132	6.05	6.15	178	−.22
Florida	5.65	45	5.76	5.78	26	.11	6.29	27	6.07	6.07	37	−.22
Texas	5.69	71	5.82	5.83	71	.13	6.34	72	6.15	6.15	119	−.19

SOURCE: Same as Table 2-2.

[a] Only one FHA loan was authorized in this period.

FHA yields came to exceed conventional yields in both groups of states, and in fact the margin was wider in states with high usury ceilings.

Any explanation must begin with the proposition that many individual lenders have an institutional preference for conventionals over FHAs at the same rate. Otherwise, barring differences in the timing of transactions or other statistical quirks, conventionals could *never* yield less. Discussions with lenders indicate that some do indeed prefer conventionals, for reasons discussed earlier. Under "normal" market conditions, the impact of lenders with an institutional preference for conventionals is more than offset by that of lenders with a preference for FHAs, so that conventionals yield more. Lenders who prefer FHAs, however, tend to maintain more diversified portfolios, and are sensitive to rate differentials between mortgages and bonds. Under conditions of extreme market stringency, such lenders tend to shift out of FHA mortgages; these mortgages must then, in large degree, be absorbed by lenders with a preference for conventionals who will accept them only at premium rates. Unfortunately there is no way at present to test this hypothesis.

Relationship Between FHA and VA Yields

The relationship between FHA and VA yields is affected by factors bearing on their relative loan quality, and by their contract rates. Klaman noted that VA yields tended to be higher, and prices to be lower during 1953–56 when their maximum contract rates were the same.[41] He noted that "in general, contract terms—maturities, down payments, and loan-to-value ratios—have been more liberal for VA loans than for FHA loans. Lenders generally have regarded VA property appraisals also as tending to be more liberal than those made by FHA. The fact that the VA guarantee is for 60 per cent of a loan (not to exceed $7500) and FHA insurance for 100 per cent of a loan may also have influenced investors' judgments about the quality of these mortgages." [42]

Our new data confirm that VA prices were lower, and discounts larger, during the 1953–56 period of contract rate equality (Table

[41] Klaman's comparisons were based on secondary market price quotations reported by the Federal National Mortgage Association, described above.

[42] Klaman, pp. 90–91.

2-16).[43] Such comparisons are not possible during the next five years because FHA and VA contract rates differed most of the time, but during 1962–66 contract rates were again the same. In this later period, the price differential was negligible. This may reflect the fact that FHA terms became more liberal during the intervening period relative to VA terms. By 1964, average down payments were only a few percentage points lower on FHA than on VA mortgages, and FHA maturities were several years longer. It is also possible that lenders became less concerned with terms during this period.

At various times, FHA mortgages have carried a higher contract rate than VAs, and this has affected their relative yield. In part, this is because the yield realized on a mortgage that is not priced at par is uncertain; it depends not only on the contract rate and the size of the premium or discount, but also on the life of the mortgage, which is not known in advance. Most mortgages are prepaid in full well before maturity. The larger the deviation from par the more important is variability in life as a determinant of realized yield.[44] Lender reaction to this uncertainty will affect relative yields.

It is quite possible that lender reactions to yield uncertainty will be different when mortgages sell at premiums than when they sell at discounts from par. When mortgages sell at discounts, yield is a decreasing function of life, and the lowest possible yield, which is realized if the mortgage runs to maturity, is not much lower than the yield at some intermediate "expected" life based on past experience or on reasonable expectations. The maximum yield in this case approaches infinity as life approaches zero. This is illustrated by the top line in Figure 2-2. When mortgages carry premiums, on the other hand, yield is an increasing function of life, as illustrated by the lower line on Figure 2-2; the lowest possible yield approaches minus infinity as life approaches zero. The maximum yield, which is realized if the mortgage goes to maturity, is not much higher than the expected yield.

The consequence of miscalculating mortgage life is thus quite different when mortgages sell at premiums than when they sell at discounts. When mortgages carry premiums, an error in the wrong direc-

[43] Prices are used in these comparisons because differences in maturities and expected life as between FHA and VA mortgages over the period covered were too small to have any significant effect on yield differences.

[44] See Jack M. Guttentag, "Mortgage Interest Rates: Trends and Structure," *1964 Conference on Savings and Residential Financing,* United States Savings and Loan League, p. 128.

TABLE 2-16. Discounts on FHA as Compared to VA Mortgages During Periods of Equal Maximum Contract Rate

Period	National Bureau Series					FNMA Series Average Discount		
	Average Contract Rate		Average Discount					
	FHA	VA	FHA	VA	VA Less FHA	FHA	VA	VA Less FHA
June–December 1953	4.49	4.49	.93	1.83	.90	2.2	2.6	.4
1954	4.49	4.49	.86	1.31	.45	1.1	1.5	.4
1955	4.48	4.48	.98	1.67	.69	1.2	1.8	.6
January–November 1956	4.48	4.49	1.72	2.17	.45	2.2	2.8	.6
1962	5.26	5.25	3.13	3.40	.27	3.2	3.3	.1
1963	5.25	5.25	1.80	1.77	−.03	2.1	2.1	.0
1964						1.8	1.9	.1
1965						1.9	1.9	.0
1966						6.1	6.1	.0

NOTE: FNMA quotations apply to 4½ per cent mortgages during 1953–56, 5¼ per cent mortgages during 1962–65, and 5¼–6 per cent mortgages during 1966 (current rate used in all cases).

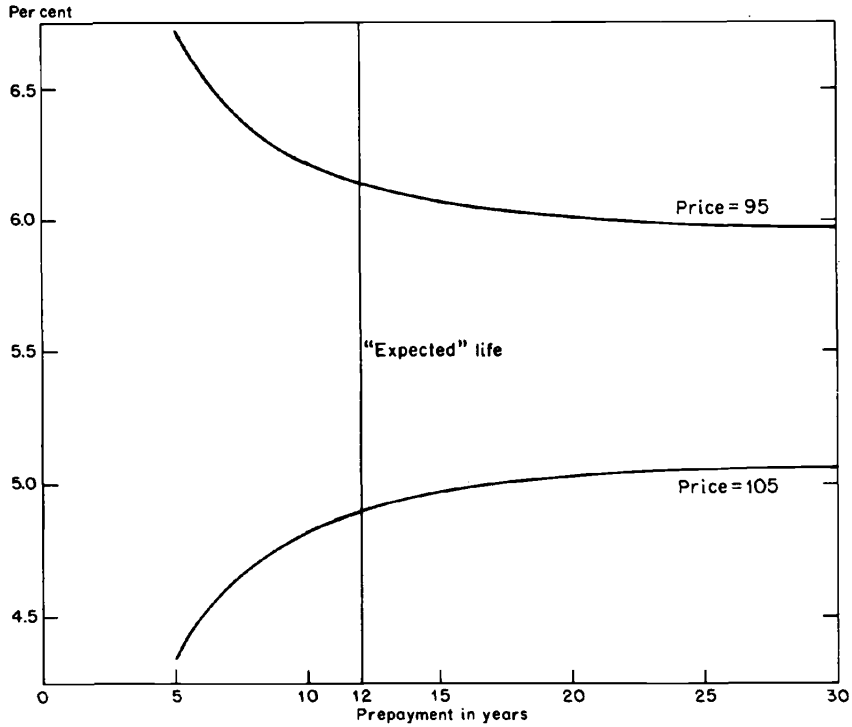


FIGURE 2-2. Yield on a 5½ Per Cent Thirty-Year Mortgage Priced at 95 and 105

tion can be very serious, since yield can be zero or negative. If the market is heavily influenced by conservative lenders, concerned with the "worst that can happen," the premium paid on high contract rate mortgages may not be large enough to equalize yield with low contract rate mortgages.

When mortgages carry discounts, in contrast, the consequence of a mistake in estimating mortgage life in the wrong direction is not serious. Other factors, however, including public relations aspects of accepting discounts from borrowers, may influence the yield.

The evidence examined here can be divided broadly into two phases, in both of which, for periods of varying length, the FHA contract rate was higher than the VA rate. These periods are prior to mid-1952, when FHAs and VAs carried premiums; and 1957–61 when they carried discounts.

THE CASE OF PREMIUMS. The data[45] confirm the supposition advanced above that lenders will be reluctant to pay a premium on a high contract rate mortgage large enough to equalize yield with a lower contract rate mortgage. Prior to April 1950, FHA Section 203 mortgages carried a maximum rate of 4½ per cent, while the VA rate was 4 per cent. One large life insurance company paid an average premium of 0.8 per cent for VAs during this period and 1.6 per cent for FHAs, producing a yield spread of .37 per cent in favor of the high-rate FHAs (Table 2-17). Put differently, the premium on FHAs would have had to have been about 4.0 points to equalize the yield with that on VAs. The FHA rate was only .14 below the conventional rate in this period.

TABLE 2-17. Premiums and Yields on FHA, VA and Conventional Mortgages Authorized by Life Insurance Companies, January 1949–April 1950 and January 1951–April 1952

	January 1949–April 1950 [a]			January 1951–April 1952		
	Contract Rate	Premium	Effective Yield	Contract Rate	Premium	Effective Yield
FHA	4.49	1.6	4.26	4.26	.5	4.19
VA	4.00	.8	3.89	4.00	−.3	4.04
Conventional	4.58	1.3	4.40	4.63	1.2	4.45

SOURCE: Same as Table 2-2.
[a] Data limited to one company.

In April 1950 the FHA rate was reduced to 4¼ per cent, and the yield on FHAs immediately fell relative to VAs and conventionals. Chart 2-3 shows a sharp rise in the yield differential of conventionals over FHAs following the rate reduction on FHAs. In the sixteen months ending April 1952, the FHA yield for life insurance companies was .07 per cent lower than in the prior period, while the yields on 4 per cent VAs and on conventionals were higher by .15 per cent and .05 per cent, respectively (see Table 2-17). This shift in the spread can be attributed largely to the decline in the FHA rate. Nevertheless, 4¼ per cent FHAs continued to yield more than 4 per cent VAs.[46]

It may be asked why, under conditions where mortages carry

[45] Publishable data prior to 1951 are limited to one large company. Fragmentary data from other sources, however, confirm the relationship shown in the table.

[46] After an adjustment for "quality," the spread would have been wider. It will be recalled that in 1953–56, when contract rates were the same, VAs yielded more.

premiums, the contract rate was not bid down by competition. The rate set by law or regulation on FHAs and VAs is, after all, a maximum rate and not a minimum. Any extended discussion of this would go well beyond the scope of this paper, but clearly, the explanation is rooted in the imperfect character of the residential mortgage market at the primary (origination) level. Among the relevant factors would be the following:

(a) The ignorance and unwillingness or inability of most mortgage borrowers to shop.[47]

(b) The apparent sanction provided the maximum rate by the federal agencies; borrowers are encouraged to believe that the government has set *the* rate, rather than merely the maximum rate.

(c) A tendency for mortgage lenders to view rate cutting as an "unethical practice." One large lender who did cut rates below the maximum in the period when FHAs carried large premiums was taken severely to task by other lenders.[48] The tendency of mortgage lenders was to view the maximum allowable rate much as personal finance companies view the legal rate ceiling on small loans, namely, as a customary rate that is in the best interest of all lenders to observe.

(d) The unwillingness of builders to bargain for a lower contract rate; the builder could usually command part of the premium from the high-rate mortgage. This might or might not be reflected in lower house prices.

It would seem an inevitable implication of the above analysis that, from the standpoint of borrower interest, contract rates on FHA and VA mortgages should never be high enough that these mortgages command premiums. As a matter of fact, they never have commanded premiums since 1953.

THE CASE OF DISCOUNTS. Following the 1953–56 period of contract rate equality between FHA and VA mortgages, rate differences arose again beginning in 1957. For this and later periods, price data on FHAs and VAs are available from FNMA as well as from the new NBER survey. The latter cover loans authorized by the large life insurance companies, while the former are largely based on over-the-counter sales by mortgage companies, mainly to life insurance com-

[47] For some evidence on this, see Housing and Home Finance Agency, "Residential Mortgage Financing, Jacksonville, Florida, First Six Months of 1950," *Housing Research Paper No. 23*, Washington, D.C., December 1952, pp. 30–33.

[48] See H. A. Schaaf, "Federal Interest Rate Policy on Insured and Guaranteed Mortgages," unpublished Ph.D. dissertation, University of California, Berkeley, 1955, p. 135.

TABLE 2-18. Discounts on FHA and VA Mortgages as Reported in NBER and FNMA Series, Selected Periods
(*percentage points*)

Period	NBER		FNMA		FNMA Less NBER	
	FHA	VA	FHA	VA	FHA	VA
Feb. 57–July 57	2.4	3.0	2.9	7.0	0.5	4.0
Oct. 57–March 58	2.3	3.2	2.6	9.2	0.3	6.0
Sept. 58–June 59	2.4	4.9	3.1	7.2	0.7	2.3
Dec. 59–Jan. 60	3.4	5.3	3.8	7.9	0.4	2.6
Dec. 60–Jan. 61	2.9	4.6	2.4	6.6	−0.5	2.0
April 61–Aug. 61	2.6	4.5	2.2	4.3	−0.4	−0.2

SOURCE: Same as Table 2-2, plus the Federal National Mortgage Association.

TABLE 2-19. Gross Yield on FHA and VA Mortgages as Reported in NBER and FNMA Series, Selected Periods
(*per cent*)

Period	Maximum Contract Rate			Gross Yield					
				NBER			FNMA		
	FHA	VA	FHA Less VA	FHA	VA	FHA Less VA	FHA	VA	FHA Less VA
Feb. 57–July 57	5.00	4.50	.50	5.33	4.93	.40	5.43	5.52	−.09
Oct. 57–March 58	5.25	4.50	.75	5.58	4.96	.62	5.63	5.86	−.23
Sept. 58–June 59	5.25	4.75	.50	5.60	5.44	.16	5.69	5.79	−.10
Dec. 59–Jan. 60	5.75	5.25	.50	6.19	6.01	.18	6.31	6.40	−.09
Dec. 60–Jan. 61	5.75	5.25	.50	6.15	5.91	.24	6.09	6.21	−.12
April 61–Aug. 61	5.50	5.25	.25	5.88	5.89	−.01	5.82	5.86	−.04

SOURCE: Same as Table 2-18.

panies and mutual savings banks. The two sources show only modest price differences on FHA mortgages, but very substantial differences on VAs. Thus, during February 1957–July 1957, NBER series show VAs carrying a discount of 3 points, while the FNMA series show VAs carrying a discount of 7 points (Table 2-18). As a result, for the large life insurance companies, the higher contract-rate FHAs yielded more, while for the lenders covered by the FNMA data the lower contract-rate VAs yielded more (Table 2-19). The yield difference was largest during the period October 1957–March 1958, when the contract rate difference between FHAs and VAs was largest (.75 per cent). During this period, FHAs authorized by the life companies yielded .62 per cent *more* than VAs, while on loans sold by mortgage companies FHAs yielded .23 per cent *less* than VAs.

When VA mortgages carried lower contract rates than FHAs, the large life insurance companies reduced their VA volume but took a limited number at relatively small discounts. This action reflected a widespread view, in Congress and elsewhere, that large discounts on VA mortgages were unethical. Klaman noted that "large financial intermediaries, in their widely acknowledged role as public trustees, have been less willing to risk public censure than to ignore the facts of market forces." [49] The result of this policy was, in effect, to create two markets for VA mortgages: a rationed low-discount market by large life insurance companies (and perhaps other lenders with similar compunctions); and a "free" market where discounts rose to the level necessary to clear the market. It is ironical that the public pressures on large institutions to limit discounts on VA mortgages, by causing them to sharply reduce their VA volume, had the effect of increasing pressure on VA discounts in the "free" market.

There are indications that life insurance company attitudes toward discounting underwent a considerable change during 1958–59, in the sense that they began to accept the discounts required to bring VA yields into an appropriate relationship to FHA yields. Comparing the October 1957–March 1958 and the September 1958–June 1959 periods, VA discounts rose by 1.7 points in the NBER series and declined by 2.0 points in the FNMA series (Table 2-18). Perhaps even more dramatic was the shift in the FHA-VA yield relationship in the NBER series (Table 2-19). Yields on VA mortgages rose by .48 per cent as VA discounts rose appreciably despite a rise in contract rate (4.50 to 4.75 per cent). Yields on FHA mortgages rose by only .02 per

[49] Klaman, p. 89.

TABLE 2-20. Prices and Yields on Current and "Old" FHA and VA Home Mortgages, Selected Periods

Period	Mortgage (per cent)	Average Price over Period	Average Yield over Period [c]	Yield Differential [d]
May 1953–Jan. 1955	FHA 4¼	96.2	4.78	
(18 observations) [a]	FHA 4½ [b]	98.6	4.70	.08
	VA 4	94.4	4.80	
	VA 4½ [b]	98.3	4.74	.06
Dec. 1956–June 1957	FHA 4½	93.4	5.47	
(7 observations)	FHA 5 [b]	97.3	5.39	.08
Aug. 1957–Dec. 1958	FHA 5	95.5	5.66	
(17 observations)	FHA 5¼ [b]	97.7	5.58	.08
April–Dec. 1958	VA 4½	92.1	5.67	
(9 observations)	VA 4¾ [b]	94.3	5.59	.08
July–Sept. 1959	VA 4¾	91.5	6.02	
(3 observations)	VA 5¼ [b]	94.8	6.02	.00
Oct. 1959–March 1960	FHA 5¼	93.0	6.30	
(6 observations)	FHA 5¾ [b]	96.2	6.31	−.01
Feb.–May 1961	FHA 5½ [b]	97.2	5.91	
(4 observations)	FHA 5¾	98.6	5.96	−.05
June 1961–Feb. 1962	FHA 5¼ [b]	96.3	5.79	
(10 observations)	FHA 5½	97.8	5.82	−.03
	FHA 5¾	99.4	5.84	−.05
March–April 1966	FHA 5¼	92.6	6.37	
(2 observations)	FHA 5½ [b]	94.5	6.33	−.04
May–June 1966	FHA 5½	92.6	6.63	
(2 observations)	FHA 5¾ [b]	94.6	6.57	−.06

SOURCE: Federal National Mortgage Association.

[a] No observations for July, September or October 1953.

[b] Current maximum rate.

[c] Assumes twenty-five-year maturity, ten-year prepayment.

[d] Low-rate mortgage less high-rate mortgage.

cent, as discounts on FHA mortgages of constant contract rate increased only slightly.

Evidently by 1961 the market had learned to live with discounts. During the period April 1961–August 1961, price quotations on VA loans were about the same in the FNMA series and the NBER series, and differences between FHA and VA yields were small. However, the contract rate difference between FHAs and VAs was only .25 per cent during this period; it is not clear how the market would have reacted to a .75 per cent difference. Since 1961 contract rates have been the same.

There is, however, some additional evidence that lenders' attitudes toward discounting underwent a change during 1959. The evidence consists of FNMA price quotations following a change in the FHA or VA maximum contract rate, on old mortgages carrying the old rate. When the contract rate is changed, new commitments will be at the new rate, but there will also be some overhang of uncommitted mortgages carrying the old rate for which mortgage companies or other originators must find buyers. FNMA continues to report prices on mortgages carrying the old rate for as long as there is any significant activity in the older mortgages. During such periods of dual coverage yield comparisons are possible between old and new mortgages carrying different contract rates (Table 2-20).

These observations reveal that through 1958 yields tended to be about .08 per cent higher on mortgages carrying the lower contract rate. In later periods, however, yields were higher on the high contract rate mortgages. These yield differentials are sensitive to the assumed maturity and prepayment, but there is no ambiguity regarding the change in the differentials. No matter what assumptions are made, a significant decline occurred in the yield on high contract rate mortgages *relative* to low contract rate mortgages, indicating a greater willingness to accept discounts as an offset to a lower contract rate.

APPENDIX TABLE. Yields on Bonds and Mortgages at Reference Cycle Peaks and Troughs

	July 1953	July 1957	May 1960	Average
Part A: Peaks				
Conventional mortgages	4.76	5.48	6.09	
FHA mortgages	4.53	5.38	6.27	
Conventional less FHA	.23	.10	−.18	.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
Conventional mortgages less Aaa corporate bonds	1.48	1.49	1.63	1.53
Conventional mortgages less Aaa state and local	2.20	2.31	2.75	2.42
Part B: Troughs				
	Aug. 1954	April 1958	Feb. 1961	Average
Conventional mortgages	4.74	5.63	5.96	
FHA mortgages	4.60	5.61	6.16	
Conventional 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
Conventional mortgages less Aaa corporate bonds	1.87	2.03	1.69	1.86
Conventional mortgages less Aaa state and local	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.