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## Purpose, Scope, and Findings

This paper is part of the broader NBER study of interest rates. Because existing statistical data on mortgage yields were inadequate for refined analytical use, new data had to be compiled on this important segment of the capital market. This task was, of course, only a step toward the ultimate goal of explaining the pattern and behavior of yields.

### Need for Data

Residential mortgages are the single most important capital market instrument. At the same time, they are the most poorly documented in the area of yields and other terms on which transactions are made. There is no mystery to this. The residential mortgage market is "messy." It embraces millions of small individual transactions disbursed yearly throughout the country. Although there is a national mortgage market—which is indeed a basic premise of this study—it is superimposed on a congeries of local markets, subject to local influences and peculiarities. Each transaction, furthermore, has many dimensions, of which interest rate or yield is only one. Obtaining reliable data on the terms of residential mortgage transactions is thus a statistical problem of costly proportions and imposing technical difficulties.

A scarcity of data on residential mortgage terms has been a source of misgiving among lenders, who need reliable data for a rational allocation of funds; among scholars with an interest in understanding the mechanics of this market and its relationship to other markets; and among policymakers with responsibility for influencing the aggregate supply of mortgage credit.

Inadequate time series data has been a particular problem to policymakers. Thus, the residential construction sector has grown increasingly important in monetary policy deliberations because of its ac-

knowledge short-run sensitivity to changing credit conditions.<sup>1</sup> Post-war experience suggests that this sector may be the single most important channel through which a countercyclical monetary policy has made its influence felt. Yet, the monetary authorities have not had reliable data showing the extent to which credit conditions in the residential mortgage market had changed.

### The New Data and Other Series

Time series analysis requires monthly data covering a reasonably long span of time and having a broad geographical basis. Given this objective and our limited resources, we turned to large life insurance companies. These companies acquire residential mortgages on a nationwide basis, their records are generally in good order and reasonably accessible, and (most important) the size of their operations makes it possible to draw a relatively large number of observations from a small number of institutions. No other approach to the task of acquiring historical series having the desired analytical characteristics was even remotely feasible.

These new data contain important attributes heretofore unavailable in a single series. First, the date of record is the date when the loan was committed or authorized by lenders, rather than the date on which funds were disbursed; thus, the long and erratic lag characteristic of series recorded on a disbursement basis is largely eliminated.

Second, the data cover all three types of residential mortgages (FHA, VA, and conventional); also, separate series are available on mortgages acquired through correspondents as opposed to those originated directly by the life insurance company.<sup>2</sup>

Third, the data include loan-value ratios and maturities, as well as

<sup>1</sup> See Jack M. Guttentag, "The Federal Reserve and the Mortgage Market: Some Perspectives of the 'Crisis' of 1966," in *A Study of Mortgage Credit*, Senate Committee on Banking and Currency, Washington, D.C., May 22, 1967, pp. 392-406; also "The Short Cycle in Residential Construction: 1946-59," *American Economic Review*, June 1961; and Warren L. Smith, "The Impact of Monetary Policy on Residential Construction, 1948-58," in *A Study of Mortgage Credit*, Committee on Banking and Currency, Washington, D.C., 1958.

<sup>2</sup> Coverage, however, is limited to first-mortgage loans by life insurance companies on one- to four-family properties; not covered are such segments of the mortgage market as junior financing, all loans on multifamily and other income-producing properties, and home mortgage loans by lenders other than life insurance companies. A separate National Bureau study by Royal Shipp will cover loans on income-producing properties.

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 and charges received by the lender is referred to as "effective yield" or simply "yield."<sup>3</sup>

Fourth, the data have a broad geographic base, since the lenders covered by the series operate in the national market. Series covering the national mortgage market are particularly useful for times series analysis, since this is the most sensitive component of the residential market. The lenders in the national market have a wide range of investment options, and shift at the margin from one investment to another. Changes in the national market thus register tendencies operative in local markets, to a degree depending on the extent to which a local market is segmented from outside influences. Cross-section yield variability in the national market is relatively small, moreover, and the series tend to be relatively homogeneous. While homogeneity is useful in time series analysis, it is, of course, a shortcoming in cross-section analysis.

The sources and main characteristics of the new series compared with other series are summarized in Table 1-1.<sup>4</sup> Most widely used is the FHA secondary market series, which is current and extends as far back as 1948. This series has always been suspect because it is based on opinions by FHA insuring-office directors rather than actual records of loans authorized or disbursed. A minor contribution of our study is to test the FHA series against the new data (Chapter 9). The FHA also has an opinion-based series on conventional contract rates beginning in 1957. An additional serious drawback to this series is that it does not specify the type of lender covered (on conventional loans, rates vary considerably by type of lender).

A second mortgage series, covering all three types of loans, has been compiled by the Federal Reserve Bank of Chicago. It covers the period 1958-63, but only during 1960-63 is it on an authorization basis, and coverage is limited to the Chicago metropolitan area.<sup>5</sup> This

<sup>3</sup> The qualifier "gross" or "net" is used to indicate that mortgage servicing costs, expressed as a per cent per annum, are included or netted from the yield.

<sup>4</sup> We omit from this discussion the annual mortgage rate series covering all types of real estate, that are used and described by Leo Grebler, David M. Blank, and Louis Winnick, *Capital Formation in Residential Real Estate: Trends and Prospects*, Princeton University Press for NBER, 1956, Appendix O.

<sup>5</sup> These data are relatively rich, however, in collateral information on terms and characteristics and are, therefore, valuable for examining the cross-section structure of yields and terms. For some preliminary results of such examination, see Jack M. Guttentag, *Mortgage Interest Rates: Trends and Structure*, 1964 Proceedings, Conference on Savings and Residential Financing, pp. 124-146.

series was superceded by the Federal Home Loan Bank Board (FHLBB) series.

The FHLBB series covers only conventional loans and extends back only to December 1962, but it is kept current and is on an authorization basis. This series overlaps the National Bureau's conventional loan series by one year. Although the two differ in a number of ways, as explained later, the similarities are close enough to warrant splicing. The FHLBB series thus provides valuable historical continuity on conventional loans. The FHLBB series also covers four major institutional lender groups in addition to life insurance companies, which provides

TABLE 1-1  
Summary of Principal Features of Various Statistical Series on  
Residential Mortgage Rates and Terms

	National Bureau	Federal Home Loan Bank Board	Federal Reserve Bank of Chicago
Type of loan	FHA, conventional, some VA	Conventional	FHA, conventional, some VA
Time period	1951-63	Dec. 1962-current	April 1958-July 1963
Monthly (M) or quarterly (Q)	M	M	M
Geographical coverage	National	National	Chicago Metro- politan area
Authorization (A), closings (C), or secondary market (SM) basis	A	A	C through April 1960, A there- after
Source of data	Lenders' histor- ical records on individual loans	Current reports by lenders on new loans approved	

revealing insights into the advantages and limitations of series covering life insurance companies alone.

Saul Klamman compiled series on conventional mortgage rates covering the period 1947-56, drawn from aggregate accounting data provided by a few large life insurance companies. These data are on a disbursement rather than an authorization basis and measure contract rate rather than yield.

Since 1953, the Federal National Mortgage Association (FNMA) has compiled price data on FHA and VA mortgages. The data are generally not made public but they were provided to Klamman and our-

Federal Housing Administration

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FHA Series	Conventional Series	Saul Klamman	Federal National Mortgage Assn.
FHA	Conventional	Conventional	FHA, VA
1949-current	1957-current	1947-56	Feb. 1953
M	Q to 1962, M thereafter	Q	M (beginning Nov. 1953)
National	National	National	National
SM	?	C	SM
Opinions of directors of FHA insuring offices on current sales		Lenders' historical records on company-wide rates	Reports by mortgage companies on current sales

(continued)

TABLE 1-1 (concluded)

	National Bureau	Federal Home Loan Bank Board	Federal Reserve Bank of Chicago
Lender coverage	Few large life insurance companies	Samples of savings and loan assns., life insurance companies, commercial banks, mutual savings banks, and mortgage companies	Samples of savings and loan assns., commercial banks, and mortgage companies
Detail available			
Contract rate	X	X	X
Fees and charges	X	X	X
Maturity	X	X	X
Loan-value ratio	X	X	X
Service fee	X	—	—
Purpose of loan	—	X	X
Income of borrower	—	—	X
Loan volume	X	—	
Geographical breakdowns available	9 regions 8 states	18 metropolitan areas	Chicago SMA only

*Source: Federal Home Loan Bank Board:* Data are contained in monthly press releases of the Board. Summary figures are also published in the *Federal Reserve Bulletin* and the *Survey of Current Business*. The Board kindly provided us with a tape record of individual loans covering the period December 1962-July 1965. The cross-section tabulations referred to in this book covering the period of rate stability, May-December 1963, were calculated by us from the basic data on individual loans contained on the tape.

*Federal Reserve Bank of Chicago:* Data are contained in monthly press releases of that Bank. The series is described in the June 1960 and May 1960 issues of *Business Conditions*, a monthly publication of the bank.

*Federal Housing Administration:* The basic price data through 1960 are shown in the August 1961 issue of *Construction Review*, a monthly publication of the Department of Commerce. Subsequent quotations are contained in monthly press releases of the FHA. A series based on FHA secondary market quotations during 1948-56 was used by one of

Federal Housing Administration			
FHA Series	Conventional Series	Saul Klamman	Federal National Mortgage Assn.
Lenders reporting to insuring office directors		Few large life insurance companies	Life insurance companies and mutual savings banks buying from reporting mortgage companies
X	X	X	X
X	-	-	X
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

6 regions

the authors in his Ph.D. dissertation (Jack M. Guttentag, *Some Studies of the Post World War II Residential Construction and Mortgage Markets*, Columbia University, 1958); it was later extended to 1957, and published by Leo Grebler in, *Housing Issues in Economic Stabilization Policy*, Occasional Paper 72, New York, NBER, 1960; subsequent extensions were published intermittently in the *Bond Buyer* (no source given). The secondary market series used in this paper and shown in Appendix Table 9-4 has been recalculated to make it as comparable as possible to the new NBER series.

*Saul Klamman*: Data are contained in his *Postwar Residential Mortgage Market*, NBER, 1961, Chapter 4 and Appendix Tables A-4, A-5, and A-7.

*Federal National Mortgage Association*: Available on direct request from that agency.

selves. These series are based on sales reported to FNMA by mortgage companies, mainly by life insurance companies and mutual savings banks. An interesting and useful feature of these data is that, following a change in maximum contract rate, FNMA continues for a time to compile data on prices of "old" mortgages carrying the old contract rate.

None of the above series has all the attributes of the NBER series described earlier. The other series do provide a valuable supplement to the NBER series, however, and several of them are used in this book.

### Data-collecting and Data-using

This book is divided into two parts. Part I describes the new series and presents some analysis of their behavior. Part II is concerned with technical problems connected with the collection, interpretation, and usefulness of mortgage yield data. Thus, the two parts of the book correspond broadly to a functional distinction between creating new data and using it.

Combining data-collecting and data-using in one study has important advantages and disadvantages. The main disadvantage is that it inverts the usual order of scientific inquiry whereby one begins with a question and looks for the data to answer it. If one begins with new data and looks for significant questions to put to the data, there is a tendency for the inquiry to lose focus. Superficiality is an added danger since the new data may provide an increment of insight into a problem without nearly exhausting it, yet any reasonably adequate and self-contained treatment of the question may require going well beyond the new body of data. Still, any attempt to exhaust the question may shift the entire nature of the study in a direction which may not warrant the investment.

How well have we avoided the twin dangers of triviality and resource misallocation? The reader will have to decide this for himself. In Chapters 3 and 4, we tried to pose questions which could take advantage of the new data and the materials already at hand, but clearly none of the questions has been exhausted. Others employing the more congenial scientific procedure of defining the question first are invited to finish the task.

The advantage of combining the data-collecting and data-using functions is that you get better data that way. Few data-users have not ex-

perienced the frustration of finding that a data-collector with no sensitivity to the ultimate purposes of the data has left out the one most important piece of information, or has defined a crucial concept in an ambiguous way. The reader will see evidence in Part II that analytical problems related to the ultimate purposes of mortgage yield data arose at numerous points in the data-collection operation. The data-collector who anticipates being a data-user clearly is in a much better position to make sensible decisions on such issues. Doubtless we didn't make all the right decisions for every purpose, since we couldn't anticipate every purpose, but we are confident that the decisions are substantially better than if we had confined ourselves to data-collecting.

### Summary of Major Findings

1. Life insurance companies, far more than other mortgage-lenders, acquire mortgages outside of the community in which they are domiciled and, to a considerable extent, outside of the region. In 1960, more than half of the loans on single-family homes held by life insurance companies were on properties in a different region, and the companies accounted for more than half of the total of such "foreign-held" loans. Mortgages which potentially might be acquired by distant lenders are in the national market. Such mortgages must be generated in sufficient volume, in a given area, to justify the administrative machinery (branch offices or correspondent relationships) needed to acquire and service mortgages at a distance. For this reason, mortgages in the national market are more likely to be secured by newly built homes in tract developments than by existing structures, and are more likely to originate within metropolitan areas than outside. Mortgages in the national market also tend to have relatively low risk, since distant lenders cannot make the detailed investigation and exercise the close surveillance required on risky loans. As a result, mortgages in the national market are more likely to be federally underwritten than conventional, and if conventional mortgages, are likely to have such characteristics as relatively high borrower income. They also carry relatively low yields. Data from census and other sources indicate that life insurance company loans have these general characteristics.

2. The life insurance companies covered by our new series were chosen because of their convenience and accessibility. Although they accounted for an appreciable share of the total mortgage lending by

life insurance companies—generally one-third to two-fifths—there is no basis for an a priori claim that the series are representative of life insurance companies on the whole. Nevertheless, there is evidence that in fact the series are representative. Yield dispersion of mortgages entering the national market, due to differences in loan and property characteristics, is small. Scope for individual lender yield variability, reflecting differences in lender policies, is correspondingly narrow. Transactions by any one quantitatively important participant in the market thus do not deviate very far from those of other such participants. Loans acquired by life insurance companies, however, are *not* representative of the residential market as a whole, for reasons already indicated. Loans entering the national market are not a cross section of residential loans.

3. There are no systematic biases in our yield series, either over the cycle or over the entire 1951–63 period, arising from cyclical changes or trends in loan and property characteristics for which we have data. This is indicated by analysis of cyclical changes and trends in loan and property characteristics, combined with cross-section regressions relating yield to characteristics. Systematic changes in yield determinants on which we do not have data, such as borrower characteristics, conceivably could bias the series, but the bias would be small as the unexplained cross-section variability is small. Over the cycle, our series probably were not significantly affected by changes in lenders' subjective appraisals of the risk associated with loans of given characteristics. Over the entire 1951–63 period, however, the risk premium on conventional loans probably declined as a result of continuously favorable repayment experience. This is suggested by a narrowing in the yield differential between conventional and FHA loans.

4. The new 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 do not support the various hypotheses advanced in earlier studies to explain this phenomenon. The relatively narrow cyclical amplitude of mortgage yields is not due to failure to allow for cyclical changes in fees and charges, at least on loans by life insurance companies. 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 also 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 borrower and lender are in direct contact, than in dealer-type markets. Negotiated markets often involve a continuing relationship between borrower and lender which blunts the tendency to maximize a short-run market position. Lenders in negotiated markets may have heavy nontransferable overhead costs, which tend to have a similar effect. In addition, the smaller amplitude of mortgage yields is affected by a lag in transmitting changes in bond yields to the mortgage market. This factor also underlies the tendency for mortgage yields to lag bond yields at cyclical turning points.

5. Differences in market organization also seem to underlie the greater cyclical sensitivity of direct mortgage loan series than of correspondent loan series. Life insurance company acquisitions from correspondents are market transactions, but the parties generally have a continuous relationship which exercises a moderating influence on yield changes. This influence may take a number of forms, including a tendency for the life insurance company to avoid frequent changes in buying rates that may be disruptive to correspondents who extend their own commitments before obtaining a life insurance company commitment. Similarly, the FHA secondary market series is more sensitive than the FHA (life insurance company) commitment series. The organization of the FHA secondary market appears to be somewhere between a negotiated market and a dealer market.

6. The new mortgage-commitment data confirm that mortgage yields tend to lag bond yields at cyclical turning points. This is not explained by the hypothesis that small changes in mortgage market conditions register first in such 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 demand for mortgage credit at given terms 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 dependent entirely on the activities of 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.

7. The sharp swing in mortgage yields during 1961-66 represents a sharp break with past patterns. During the long stretch of easy money extending from 1961 to 1965, mortgage yields continued to decline long past 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 relative importance of time deposits in 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 mortgages that have relatively high yields. 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. The banks were under the same pressures to meet business loan demands as in earlier periods of restraint, although without a 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. The withdrawal of funds from savings institutions in 1966 impinged directly on the mortgage market and resulted in an unprecedented rise in mortgage yields.

8. There is some indication that the yield advantage of conventional over FHA mortgages declined secularly over the period 1949-66. Presumably this 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, however, in late 1959-60 and in 1966, FHAs came to yield appreciably more than conventionals. 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, regardless of whether usury ceilings are low, high, or nonexistent. 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.

9. 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, the higher contract rate FHAs carried higher yields. This probably resulted from the 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 overestimate 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 equalize yield with 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, which is realized if the mortgage runs to maturity, is not much lower than the yield based on 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, however, raise public relations problems, 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 smaller discounts on VAs than those necessary to equalize the yield with 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 ironic 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 changed in the sense that they accepted 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.

10. Cyclical changes in loan-value ratios and maturities on life insurance company loans during 1951-63 are broadly consistent with the hypothesis that these characteristics will move in a way to reinforce the effect of yields; that is, they will decline when yields rise and vice versa. The evidence also reveals, however, that this pattern can be suppressed or disrupted by a number of influences. Thus, on conventional mortgages, the expected cyclical changes were constrained by the relatively low legal ceilings on loan-value ratios and the thrust of secular liberalization on maturities; on FHA mortgages, the expected pattern was disrupted by frequent changes in legal ceilings on both loan-value ratios and maturities. Only on VA mortgages did the expected pattern reveal itself, and during part of the period life insurance companies were virtually out of this market. The most important channel through which the expected pattern manifested itself was changes in the mix of the three types of mortgages. The companies tended to shift into conventional and out of FHA and VA mortgages when interest rates rose, which tended to reduce the weighted average loan-value ratio and maturity on all home mortgages.