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## The Structure of the Mortgage Market for Income Property Mortgage

Loans

*Royal Shipp*

### *Introduction and Summary*

At the end of the second quarter of 1967, mortgage debt outstanding on nonfarm multifamily and nonresidential properties (hereafter referred to as income properties) had reached over \$100 billion and constituted nearly three-tenths of all mortgage debt outstanding. Over the past decade, mortgage debt on income properties grew at a faster rate than any other major type of indebtedness.

Despite the size and growth of this sector of the capital markets, few comprehensive studies have been made of the market for mortgage loans on income properties, mainly due to a lack of statistical data.

NOTE: This paper was prepared while the author was employed by the Board of Governors of the Federal Reserve System. It expresses his views and not necessarily those of the Board of Governors. The author is indebted to several colleagues at the Federal Reserve and to others associated with the National Bureau of Economic Research for assistance in preparing the paper. From the Board's staff, Erling T. Thoresen gave sound advice regarding the choice and use of a computer program to tabulate the data, Kathryn Morisse wrote a number of computer programs, and Peter M. Keir and Bernard N. Freedman made helpful suggestions. Robert P. Shay of the National Bureau of Economic Research and Richard T. Selden of Cornell University also read and commented on the paper. A particularly large debt is owed to Robert Moore Fisher of the Federal Reserve's Capital Markets Section, and to Jack M. Guttentag, each of whom read several drafts and made extensive comments. Only the author, of course, is responsible for any shortcomings or errors which remain.

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The National Bureau of Economic Research, with a grant from the Life Insurance Association of America, attempted to remedy this situation by including income property loans in its survey of mortgage rates. Monthly data on the rates and terms, as well as property and borrower characteristics, were obtained on income property mortgage loans authorized since 1951 by fifteen large life insurance companies.<sup>1</sup> The Federal Reserve Board expressed an early interest in the project, providing resources to help with the final stage of the data-collecting process and to tabulate and analyze the data.

This paper presents preliminary findings from the first stage of the study which is based on the four cross-section quarters of the historical data for which the most information was obtained.<sup>2</sup> These findings document relationships among certain basic characteristics of income property loans that heretofore have generally been estimated by conventional rules of thumb and from the findings of isolated case studies.<sup>3</sup> The paper presents statistical information about the characteristics of loans, borrowers, and property that not only helps to illustrate how the market for these mortgages has been operating but also provides tentative guidelines for persons concerned with real estate appraisal, market analysis, and lender supervision.

The central conclusions of the paper concern relationships among loan characteristics. First, loan size is an important factor in explaining levels of other loan transaction characteristics. For example,

<sup>1</sup> See Appendix A to this chapter for a list of the companies participating in the survey and their share of the total resources of all life insurance companies. These fifteen companies probably account for about 15 per cent of the total mortgage debt outstanding on income properties. While the historical data were being collected, arrangements were made for the same companies to report current data monthly to the Life Insurance Association of America, beginning in July 1965 when the historical series terminated. Robert Killebrew had responsibility for much of the field work necessary to compile the historical data. Barbara Negri Opper, formerly of the LIAA, supervised the initial collection and tabulation of the current data supplied by the reporting companies.

<sup>2</sup> These quarters and the number of loans authorized in each are 3rd 1954 (514), 4th 1959 (720), 3rd 1963 (828), and 1st 1965 (895). Analysis of the data is being broken into three stages. The second stage will be a cross section regression study of the relationship between interest rates and other loan characteristics. (Stages one and two utilize only information from the four quarters mentioned above.) The third stage will consist of the development of an historical interest rate series to link up with the current series being compiled by the LIAA.

<sup>3</sup> These relationships are examined by cross classifying the characteristics. While cross classification is a useful technique for preliminary analysis and description of the data, it usually is limited to a consideration of three or four variables at one time. Obviously, it cannot explain all the relationships, particularly since most of the characteristics are intercorrelated.

loan maturities and loan-value ratios vary directly with loan size. In addition, loan size is related to loan amortization arrangements,<sup>4</sup> the presence or absence of borrower liability, and the period of time between the date of loan authorization and the date of loan closing. Perhaps the most surprising finding is that the relationship between loan size and interest rates, as shown by simple cross classification, is a weak one.

Second, the terms of loan transactions also vary by property type and by property leasing arrangements. These factors are related to loan terms, presumably because they reflect the lender's assessments of size and degree of certainty of estimated property income streams.

Third, capitalization rates can be used as proxy measures of the lender's assessment of mortgage risks. The data show that relatively liberal loan terms are consistently associated with low capitalization rates, and vice versa.

Fourth, the relationship between interest rates and other loan terms is not pronounced. The main reason for this is that loan terms, as well as interest rates, are related to risk, and a good part of the variability in risk is absorbed by changes in terms.

### *Terms of Loan Transactions*

Terms of loan transactions to be discussed in this section are: interest rate, service fee, maturity, loan-value ratio, loan amount, loan repayment provisions, and extent of borrower liability.

**INTEREST RATE.** Interest rate in this paper refers to the contract, or nominal, interest rate. Although contract rate adjusted for fees and charges, termed "effective yield," is generally viewed as the preferable measure, much of the information from the life insurance companies which would have been necessary to calculate effective yield (i.e., data regarding one-time fees which lenders paid or received in connection with the origination of the loans) was incomplete. In addition, the data available on origination fees suggest that such fees were small in comparison with the contract rate. As a result, the fees, if included, would have caused contract rates to differ little from effective yields.

<sup>4</sup> The term "amortization arrangement," discussed in more detail below, refers to the conditions under which repayment of loan principal takes place. For example, the loan principal may be repaid gradually over the life of the loan, it may be repaid in one lump sum at the end of the loan life, or some other arrangements may be made.

Average interest rates varied among the four quarters, with the low being 4.72 per cent in 1954 and the high 6.14 per cent in 1959. The rates for 1963 and 1965 were 5.88 and 5.91 per cent, respectively.<sup>5</sup> As Table 3-1 shows, the average interest rate also varied considerably

TABLE 3-1. Average Interest Rates by Type of Property and Quarter

Type of Property	3rd Quarter 1954	4th Quarter 1959	3rd Quarter 1963	1st Quarter 1965
Elevator apartments	4.47	6.13	5.88	5.96
Nonelevator apartments	4.94	6.19	5.99	6.01
Hotels and motels	5.00	6.44	6.05	6.32
Retail stores	4.61	6.03	5.70	5.72
Shopping centers	4.70	6.17	5.81	5.77
Office buildings	4.53	6.08	5.78	5.80
Medical office buildings	4.82	6.14	5.81	5.90
Warehouses	4.65	6.05	5.79	5.81
Industrial properties	4.61	6.17	5.78	5.81
Misc. commercial properties	4.67	6.11	5.74	5.74
Institutional properties	4.62	6.18	5.86	6.10
All loans	4.72	6.14	5.88	5.91

NOTE: See Appendix B for an explanation of the kinds of properties included in the different categories in this table.

among property types. The highest interest rates (hotels and motels in every quarter) ranged 35–60 basis points above the lowest (retail stores in three of the quarters and elevator apartments in the other).<sup>6</sup>

Interest rates seemed to cluster at different levels. In the later three

<sup>5</sup> Averages used in this paper were weighted by number of loans. In the remainder of the text of this paper only the year will be used to designate the different periods.

<sup>6</sup> Interest rates on most income property mortgage loans were in denominations of one-fourth of 1 per cent (for example, 4.00, 4.25, 4.50). In some instances, they were in eighths of a per cent (for example, 4.125, 4.375), and in a few cases the contract rate was not constant for the entire life of the loan. For example, one loan had a contract rate of 6 per cent for the first four years and 5.75 per cent for the remaining life of the loan. An average contract rate was computed for loans with varying rates by taking the outstanding loan balances at the middle of each year and adding them up for all the years outstanding, assuming that the loan would be repaid in full after one-half its contract maturity. This total was then divided into the sum of dollars of interest payable in each year to give an average interest rate.

quarters, about one-half of the loans were made at 6 per cent. In 1954, nearly one-third were at 4.50 per cent. In every quarter, around nine-tenths of the loans were within a range of 1 percentage point. For example, in 1965, 93 per cent of the loans had interest rates between 5.50 per cent and 6.49 per cent.

**SERVICE FEES.** Loan servicing<sup>7</sup> is handled by life insurance companies in two different ways. Some loans are serviced by the home office or a branch office of the lending company. These are called direct loans and the cost of servicing them is absorbed as a general overhead expense. In other cases, lenders contract with correspondents (usually mortgage companies) to service the loans. These are known as correspondent loans and the correspondents are paid a fee for servicing the loan which is calculated as a per cent per year of the outstanding amount. (See Table 3-2 for the proportion of correspondent and direct loans in each quarter.)

Two of the life insurance companies in the survey have branch offices throughout most of the United States, thus enabling them to originate and service nearly all of their loans. These two companies accounted for between 70 and 90 per cent of the direct loans during the four quarters. Eight companies used correspondents for nearly all of their servicing needs, and five companies for two-thirds and five-sixths of their needs, servicing the remainder directly.

Fees charged on about half the correspondent loans recorded in the survey were for a constant per cent per year of the outstanding balance. The other half of the service fees varied in percentage terms as the outstanding loan balance declined (called the variable balance type), or as time passed (called variable time type). Five companies in the survey used the variable balance method for at least some of their loans; one of the largest companies used it almost exclusively.

One company used the following variable balance formula to calculate service fee on some of its loans: one-fourth of 1 per cent on the first \$100,000 of the loan; one-eighth of 1 per cent on the next \$300,000

<sup>7</sup> Loan servicing has been defined by Sherman J. Maisel as "The collection of payments on a mortgage. [It] . . . also consists of operational procedures covering accounting, bookkeeping, insurance, tax records, loan-payment follow-up, delinquent-loan follow-up, and loan analysis." See *Financing Real Estate*, New York, 1965, p. 424. For a more extensive discussion of loan servicing, see Henry E. Hoagland and Leo D. Stone, *Real Estate Finance*, 3rd ed., Homewood, Illinois, 1965, pp. 294-295, and also Kurt F. Flexner and Roger B. Hawkins (eds.), *Mortgage Officer Handbook*, The American Bankers Association, 1963, pp. 139-159, 189-211.

TABLE 3-2. Number and Per Cent of Loans by Type of Servicing Arrangement

Type of Servicing Arrangement	3rd Quarter 1954		4th Quarter 1959		3rd Quarter 1963		1st Quarter 1965	
	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent
Correspondent loans	261	51.1	438	60.9	527	63.7	516	58.0
Direct loans	250	48.9	281	39.1	300	36.3	374	42.0
All loans	511	100.0	719	100.0	827	100.0	890	100.0

NOTE: The number of loans shown in some tables will differ from the numbers given in footnote 2. This is because some information was not available for certain loans. For example, in the case of five loans in the first quarter 1965, the information necessary to determine whether they were correspondent or direct was missing.

of the loan; and one-sixteenth of 1 per cent on the remainder of the loan. If a \$1 million twenty-year loan were made, the first year's service fee would be calculated as follows:

$$\begin{aligned}
 .0025 \times \$100,000 &= \$250.00 \\
 .00125 \times \$300,000 &= \$375.00 \\
 .000625 \times \$600,000 &= \underline{\$375.00} \\
 &= \$1,000.00
 \end{aligned}$$

After the outstanding loan amount declined to \$400,000 or less, the .0625 per cent rate would no longer be used. When the outstanding amount was \$100,000 or less, the amount of service fee would be .25 per cent of the outstanding balance.

The variable-time method was used by one company (accounting for about one-tenth of the loans in the survey) for most of its correspondent loans. Other companies used it only in isolated instances. Using this method, the percentage rate is constant for a specified number of years, then changes. For example, the rate might be .25 per cent for the first three years and .125 per cent thereafter.<sup>8</sup>

<sup>8</sup> In order to make service fees on correspondent loans with variable formulas comparable to those with constant service fee percentages, it was necessary to convert the former into a constant average percentage for the estimated life of the loan. This was done by assuming that the loan would be outstanding for one-half its contract maturity. Then the total dollar amount of service fee required for that period (based on the formula) was divided by the sum of outstanding loan balances (taken at the middle of each year) for the half-life of the loan.

The average service fee for correspondent loans declined from nearly .40 per cent in 1954 to about .25 per cent in 1963 and 1965 (see Table 3-3). In all four quarters, the average service fee varied inversely with loan amount. In 1965, for example, the average service fee was .33 per cent for loans under \$100,000. The fee declined steadily as loan size increased, being .04 per cent for loans of \$10 million and over. The larger average loan size in the later two quarters only partially explains the lower average service fees in those periods, however. Service fees also declined within loan size categories.

**LOAN AMOUNT.** Loans included in the survey ranged in size from under \$25,000 to over \$25 million. Table 3-4 indicates that more of the larger loans were made in 1963 and 1965 than in the other two quarters. In 1954 and 1959, around three-fourths of the loans were under \$250,000; in 1963 and 1965, this proportion was less than one-half. About one-sixth of the loans made in 1963 and 1965 were for \$1 million or more as compared to slightly over one-twentieth in the two earlier periods.

The large size of some income property loans limits the kinds and numbers of institutions able to make the loans. This is borne out to some extent by the present study. The five smallest companies in the survey, each with assets of less than \$2 billion (see Appendix A), made only 4 per cent of the loans for \$1 million or more in the four quarters. But these same five companies made 15 per cent of the total number of loans during the four quarters.

The large loans accounted for a great share of the total dollar amounts loaned. In 1963 and 1965, loans of \$1 million or more accounted for one-sixth of the number of loans but for about two-thirds of all dollars loaned. Even in the earlier two quarters when large loans were relatively less numerous, loans of \$1 million and above (about one-twentieth of the number of loans) constituted about half of the dollar amounts.

*Loan Size and Other Loan Characteristics.* In this paper, loan size is used to cross classify many other loan characteristics to which it appears to be closely related. (The relationship of loan size to service fee has already been considered.) In part this relation may reflect the fact that the size of loan acts as a proxy for the size and financial strength of the borrowers.

Loan size varied directly with the length of time between the authorization and the closing of loans. Data on all loans in this study were obtained as of the date of loan authorization (when funds were committed



TABLE 3-3. Average Contract Interest Rates, Service Fees, and Net Increase Rates of Direct and Correspondent Loans by Loan Amount and Quarter

Loan Amount (\$000)	Correspondent															
	Direct (contract rate)						Correspondent									
	3rd Qtr. 1954	4th Qtr. 1959	3rd Qtr. 1963	1st Qtr. 1965	Con- tract Rate	Serv- ice Fee	3rd Qtr. 1954	4th Qtr. 1959	3rd Qtr. 1963	1st Qtr. 1965	Con- tract Rate	Serv- ice Fee	Net Rate			
Under 100	4.81	6.09	5.84	5.85	4.87	.44	4.42	6.18	.38	5.80	5.97	.35	5.62	6.04	.33	5.71
100-249	4.57	6.09	5.74	5.77	4.76	.35	4.40	6.18	.33	5.86	5.93	.27	5.67	5.98	.28	5.70
250-499	4.50	6.07	5.83	5.76	4.59	.29	4.29	6.14	.26	5.88	5.96	.24	5.72	6.03	.26	5.77
500-749	4.40	6.15	5.83	5.88	4.75	.24	4.51	6.18	.23	5.96	5.98	.21	5.77	5.96	.22	5.74
750-999	4.25 <sup>a</sup>	6.20	5.75	5.83	4.63 <sup>a</sup>	.28 <sup>a</sup>	4.34 <sup>a</sup>	6.19	.21	5.99	5.92	.17	5.76	5.92	.19	5.73
1,000-1,999	4.28	6.25	5.75	5.89	4.75 <sup>a</sup>	.25 <sup>a</sup>	4.50 <sup>a</sup>	6.07	.20	5.87	5.92	.16	5.76	5.92	.16	5.75
2,000-4,999	4.25	6.14	5.82	5.83	4.50	.16	4.34	6.13	.19	5.94	5.83	.10	5.73	5.89	.12	5.77
5,000-9,999	4.41	6.00 <sup>a</sup>	5.50	5.75	4.56 <sup>a</sup>	.13 <sup>a</sup>	4.43 <sup>a</sup>	6.00 <sup>a</sup>	.08 <sup>a</sup>	5.92 <sup>a</sup>	5.71	.08	5.63	5.82	.08	5.74
10,000 and over	4.50	6.25 <sup>a</sup>	5.75 <sup>a</sup>	5.67	—	0	—	—	0	—	—	0	—	5.38 <sup>a</sup>	.04 <sup>a</sup>	5.34 <sup>a</sup>
All loans	4.64	6.10	5.79	5.81	4.79	.39	4.41	6.17	.33	5.85	5.94	.24	5.70	5.98	.25	5.73

NOTE: Direct loans are those serviced (and usually originated) by the lender. Correspondent loans are originated and serviced by a correspondent (usually a mortgage company). Net rates of contract rates. Variable balance and variable time service fees have been converted to a constant per cent per year, as described in footnote 8, and included in this table. Subgroups may not add exactly to totals because of rounding.

<sup>a</sup>Fewer than five loans.

TABLE 3-4. Number of Loans and Total Dollars Loaned by Loan Amount and Quarter

Loan Amount (\$000)	3rd Quarter 1954		4th Quarter 1954		3rd Quarter 1963		1st Quarter 1965	
	Number	Total Dollars (\$000,000)	Number	Total Dollars (\$000,000)	Number	Total Dollars (\$000,000)	Number	Total Dollars (\$000,000)
Under 100	262	12	304	17	173	11	166	11
100-249	146	22	226	34	237	39	267	45
250-499	44	15	99	33	157	56	177	60
500-749	19	11	39	23	78	46	93	56
750-999	7	6	14	12	52	43	39	34
1,000-1,999	12	16	19	27	76	98	81	109
2,000-4,999	15	39	15	39	38	110	53	150
5,000-9,999	5	33	2	13	13	85	12	74
10,000 and over	1	10	2	28	3	48	7	105
All loans	511	166	720	225	827	535	895	643
	Loans (per cent)	Dollars (per cent)	Loans (per cent)	Dollars (per cent)	Loans (per cent)	Dollars (per cent)	Loans (per cent)	Dollars (per cent)
Under 100	51.0	7.5	42.2	7.6	20.9	2.0	18.5	1.7
100-249	28.4	13.4	31.4	15.2	28.6	7.2	29.8	6.9
250-499	8.6	9.2	13.8	14.6	19.0	10.4	20.0	9.4
500-749	3.7	6.7	5.4	10.1	9.4	8.6	10.4	8.7
750-999	1.4	3.5	1.9	5.2	6.3	8.1	4.4	5.2
1,000-1,999	2.3	9.9	2.6	11.8	9.2	18.3	9.1	17.0
2,000-4,999	2.9	23.8	2.1	17.4	4.6	20.5	5.9	23.3
5,000-9,999	1.0	19.9	0.3	5.8	1.6	15.9	1.3	11.5
10,000 and over	0.2	6.0	0.3	12.2	0.4	9.0	0.8	16.4
All loans	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

NOTE: Subgroups may not add exactly to totals because of rounding.

TABLE 3-5. Number of Months Loan Authorizations Were Outstanding

Number of Months Between Authorization and Closing	3rd Quarter 1954			4th Quarter 1959		
	Num- ber	Per Cent	Average Amount (\$000)	Num- ber	Per Cent	Average Amount (\$000)
Authorized and closed						
same month	17	5.6	132	18	4.4	181
1-3 months	140	46.5	187	96	23.3	202
4-6 months	49	16.3	149	60	14.6	187
7-9 months	26	8.6	212	77	18.7	143
10-12 months	17	5.6	251	69	16.7	229
13-18 months	18	6.0	922	42	10.2	476
Over 18 months	11	3.7	1,150	20	4.9	621
Authorization expired	23	7.6	265	30	7.3	284
All loans	301	100.0		412	100.0	

NOTE: Percentages may not add exactly to 100 because of rounding.

for a particular loan) and not as of the date of loan closing (when funds were paid out to borrowers).<sup>9</sup> This dating distinction is important because characteristics of mortgage loans at the time of closing reflect the market conditions of an earlier time, which varies depending on the time lag between authorization and closing.<sup>10</sup>

The length of time between the authorization date and the closing date for the loans in this survey ranged from less than one month to over eighteen months (see Table 3-5). Authorization periods were usually longer for loans in 1959 than in 1954. During 1959, just over one-fourth of the loans were closed within three months of authorization; nearly one-half were closed between seven and eighteen months after authorization. In 1954, over one-half of the loans were closed within three months of their authorization date. Table 3-5 also shows that larger loans tend to have longer authorization periods than shorter ones. In 1954, for example, the average size of a loan with an authori-

<sup>9</sup> Some loans included in the survey were authorized but, for a variety of reasons, were never closed. These loans are labeled "Authorization expired" in Table 3-5. They constituted between 7 and 8 per cent of the loans authorized in 1954 and 1959, the only periods in the present study for which this information is available.

<sup>10</sup> For a more comprehensive discussion of the advantages of data based on the authorization date see Jack M. Guttentag, "Mortgage Interest Rates: Trends and Structure," in *Conference on Savings and Residential Financing, 1964 Proceedings*, pp. 130-131.

zation period of over one year was about \$1 million. But the average size of a loan with an authorization period under one year was less than \$200,000.

Other characteristics affected by loan size will be discussed below. Since larger loans carry more liberal nonrate terms (as the subsequent discussion will show), interest rates might have been expected to vary with loan size as well. As Table 3-3 indicates, however, no such relationship prevailed. The level of interest rates seemed to be largely independent of loan size.

**MATURITY.** Holding other loan terms constant, the maturity of an amortized loan determines the rate at which the principal must be repaid, hence, the amount still outstanding at any time after closing. The longer the maturity, the lower will be the periodic payments toward principal and interest required to service the loan. This means that with a longer maturity, any income from property operations will more likely be sufficient to cover debt payments. That, in turn, reduces the likelihood of delinquency or default. With longer maturities, however, a greater amount of the original loan will be outstanding at any time after closing; hence the risk of loss is greater should delinquency or default occur.

Average loan maturity increased from a little over fifteen years in 1954 to nearly twenty years in 1965. This change appears to represent a secular lengthening of maturities over the period. Like interest rates,

TABLE 3-6. Frequency Distribution of Loan Maturities by Quarter

Maturity (years)	3rd Quarter 1954		4th Quarter 1959		3rd Quarter 1963		1st Quarter 1965	
	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent
10.0 and under	101	19.8	62	8.6	27	3.3	21	2.3
10.1-14.9	42	8.2	50	6.9	26	3.1	21	2.3
15.0	185	36.2	213	29.6	147	17.8	141	15.8
15.1-19.9	54	10.6	38	5.3	44	5.3	71	7.9
20.0	107	20.9	328	45.6	436	52.7	398	44.5
20.1-24.9	13	2.5	23	2.9	104	12.6	170	19.0
25.0	6	1.2	6	0.8	31	3.7	54	6.0
Over 25.0	3	0.6	0	0	12	1.4	19	2.1
All loans	511	100.0	720	100.0	827	100.0	895	100.0

NOTE: Percentages may not add exactly to 100 because of rounding.

loan maturities show a tendency to cluster at particular levels. In the later three quarters, nearly one-half of the loans were made with maturities of twenty years. In 1954, fifteen years was the most common maturity with over one-third of the loans at that figure (see Table 3-6).

Average maturities were longer on larger loans than on smaller ones in all four quarters (see Table 3-7). The average maturity in 1965 was seventeen years for loans under \$100,000; it was over twenty-five years for loans of \$10 million or more.

TABLE 3-7. Average Loan Maturities by Loan Amount and Quarter.  
(years)

Loan Amount (\$000)	3rd Quarter 1954	4th Quarter 1959	3rd Quarter 1963	1st Quarter 1965
Under 100	14.4	16.4	17.0	17.0
100-249	15.2	17.2	18.2	18.8
250-499	16.7	17.4	19.3	19.8
500-749	18.1	18.3	19.7	19.8
750-999	20.6	17.3	20.1	21.1
1,000-1,999	18.9	18.8	20.9	21.8
2,000-4,999	18.9	20.0	22.5	22.6
5,000-9,999	19.0	20.2 <sup>a</sup>	24.0	23.2
10,000 and over	26.3 <sup>a</sup>	22.5 <sup>a</sup>	25.1 <sup>a</sup>	26.6
All loans	15.3	17.0	19.0	19.5

<sup>a</sup> Fewer than five loans.

*Per Cent-Constant Ratio.* If a loan is fully amortizing with uniform payments, its maturity and interest rate determine the amount of required debt payments per dollar loaned. Per cent constant (sometimes called annual constant) is a ratio used by borrowers and lenders to indicate the size of annual debt payments in relation to the loan amount.<sup>11</sup> As Table 3-8 shows, per cent constant varies directly with changes in interest rates and inversely with changes in maturities.

<sup>11</sup> Per cent constant equals

$$12 \left[ \frac{i}{1 - \frac{1}{(1+i)^n}} \right]$$

where  $i$  is interest rate per month and  $n$  is maturity in months. The formula assumes fully amortizing, uniform monthly payments loans. Another way to derive per cent constant is to divide the annual debt payment by the original loan amount.

Borrowers on income properties often prefer a combination of interest rate and maturity which gives them the smallest possible per cent constant.

TABLE 3-8. Per Cent-Constant Ratios for Selected Contract Interest Rates and Maturities (*per cent*)

Maturity (years)	Contract Interest Rate			
	4.5 Per Cent	5 Per Cent	5.5 Per Cent	6 Per Cent
10	12.4	12.7	13.0	13.3
15	9.2	9.5	9.8	10.1
20	7.6	7.9	8.3	8.6
25	6.7	7.0	7.4	7.7
30	6.1	6.4	6.8	7.2

SOURCE: Adapted from *Monthly Payment Direct Reduction Loan Amortization Schedules*, 9th ed., Boston, 1958.

Differences in the level of per cent-constant ratios during the four quarters are explained by changes in average interest rates and maturities. The per cent constant averaged 9.6 in both 1954 and 1959

TABLE 3-9. Average Per Cent-Constant Ratios by Loan Amount and Quarter (*per cent*)

Loan Amount (\$000)	3rd Quarter 1954	4th Quarter 1959	3rd Quarter 1963	1st Quarter 1965
Under 100	10.0	9.8	9.7	9.7
100-249	9.4	9.6	9.2	9.0
250-499	8.9	9.5	8.8	8.7
500-749	8.4	9.2	8.7	8.6
750-999	7.8	9.5	8.4	8.4
1,000-1,999	7.9 <sup>a</sup>	9.5	8.4	8.1
2,000-4,999	12.2 <sup>a</sup>	8.4	7.8	7.9
5,000-9,999	7.5 <sup>a</sup>	—	7.7	7.6
10,000 and over	6.5 <sup>a</sup>	—	7.5 <sup>a</sup>	7.0 <sup>a</sup>
All loans	9.6	9.6	9.0	8.8

NOTE: Includes only fully amortizing, uniform payment loans.

<sup>a</sup> Fewer than five loans.

(see Table 3-9) despite the fact that interest rates were much higher in 1959. This was because the average maturity had lengthened between the two dates. In 1963 and 1965 when interest rates were only slightly below the 1959 high, however, the average per cent constant was substantially lower than in the other two quarters because maturities had continued to lengthen.

Table 3-9 also indicates that per cent constant was smaller for larger loans. This reflected the relation between maturity and loan amount mentioned above. It meant that per dollar of loan, principal was repaid more slowly on larger loans.

**LOAN-VALUE RATIO.** The size of loan-value ratios on life insurance company mortgage loans is limited by state statutory regulations. Although each life insurance company is "domiciled" or chartered in a particular state, the company may obtain licenses to do business in other states. (Several companies in the survey are licensed to do business in every state. The other companies are licensed in most states.) The question remains unresolved as to which state's investment regulations apply when a company domiciled in one state makes a loan in another state.<sup>12</sup>

As a general rule, the companies in the survey were limited to loan-value ratios of two-thirds for most of the loans they made in the 1954, 1959, and 1963 quarters. By 1965, most companies could make 75 per cent loans in most states.

Loan-value ratios in this study were calculated by dividing the loan amount by the appraised value of the property as determined by the lending company. The average loan-value ratio increased over the period studied, going from 60 percent in 1954 to almost 69 per cent in 1965 (see Table 3-10). Loan-value ratios seemed to be larger for the larger loans.

**LOAN REPAYMENT PROVISIONS.** All loan contracts contain conditions for the repayment of principal. The amortization provision controls the rate at which regular repayments of principal are made. The prepayment provision controls repayments of principal at a rate faster than the regular schedule.

*Loan Amortization Arrangements.* Nearly 90 percent of the loans

<sup>12</sup> See the discussion of this problem in *Life Insurance Companies As Financial Institutions*, a monograph prepared for the Commission on Money and Credit by the Life Insurance Association of America, Englewood Cliffs, N.J., 1962, pp. 75-94, 110-113, 148-150.

TABLE 3-10. Average Loan-Value Ratio by Loan Amount and Quarter (per cent)

Loan Amount (\$000)	3rd Quarter 1954	4th Quarter 1959	3rd Quarter 1963	1st Quarter 1965
Under 100	59.2	62.3	63.9	67.4
100-249	59.8	63.9	65.5	68.7
250-499	59.4	62.3	66.1	68.4
500-749	60.3	62.8	66.4	70.2
750-999	67.0	59.7	67.3	70.3
1,000-1,999	66.6	62.4	66.4	68.4
2,000-4,999	66.6	63.2	68.8	70.7
5,000-9,999	64.8	69.7 <sup>a</sup>	66.5	71.7
10,000 and over	66.7 <sup>a</sup>	70.6 <sup>a</sup>	71.6 <sup>a</sup>	77.0
All loans	60.0	62.9	65.7	68.8

<sup>a</sup> Fewer than five loans.

included in the survey were fully amortizing (see Table 3-11).<sup>13</sup> Most of these loans required monthly payments of equal size, although quarterly payments were made in some instances.<sup>14</sup> A substantially smaller proportion of loans was fully amortizing in 1954 than in the other quarters. This was particularly true for loans of \$1 million and over, as Table 3-11 indicates. In 1954, only 29 percent of these large loans were fully amortizing, compared with between 75 and 80 per cent in the later periods. Loans of under \$1 million were also more likely to be fully amortizing in the later three quarters, although the difference was not so great as for the larger loans.

A secular shift in the proportion of loans fully amortizing, par-

<sup>13</sup> That is, periodic payments made by borrowers to lenders include both principal and interest, and when the loan matures the principal will have been fully repaid.

<sup>14</sup> The frequency (monthly, quarterly, annual) of loan repayments was not recorded in the survey. In calculating some of the ratios examined in this paper (such as per cent constant and average service fee for loans using the variable formulas) it was necessary to make an assumption regarding repayment frequency. Since most loans in the survey required monthly payments, the assumption was made for calculating purposes that all loans were amortized monthly. The difference between monthly and quarterly payments is small in terms of dollar amounts involved. In the case of a 6 per cent, 20-year, \$1 million, fully amortizing loan with uniform payments, the annual debt payments (including principal and interest) would be \$86,192 if payments were made quarterly and \$85,968 if made monthly—a difference of \$224. The difference occurs because quarterly-payment loans always have a larger amount outstanding; hence, interest payments are slightly larger.



TABLE 3-11. Number and Per Cent of Loans by Amortization Arrangements and Quarter

Amortization Category	3rd Quarter 1954		4th Quarter 1959		3rd Quarter 1963		1st Quarter 1965	
	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent
Fully amortizing:								
Uniform payments	367	74.3	596	88.6	690	83.6	723	86.4
Irregular payments	22	4.5	15	2.2	38	4.6	32	3.8
Partially amortizing:								
Uniform payments	93	18.8	59	8.8	85	10.3	73	8.7
Irregular payments	12	2.4	3	0.4	12	1.5	9	1.2
All loans	494	100.0	673	100.0	825	100.0	837	100.0
			3rd Quarter 1954	4th Quarter 1959	3rd Quarter 1963		1st Quarter 1965	
Per cent of loans under \$1 million which are:								
Fully amortizing		82.1		91.7		90.4		92.3
Not fully amortizing		17.9		8.3		9.6		7.7
All		100.0		100.0		100.0		100.0
Percent of loans \$1 million and over which are:								
Fully amortizing		29.0		75.7		76.7		80.9
Not fully amortizing		71.0		24.3		23.3		19.1
All		100.0		100.0		100.0		100.0

NOTE: Percentages may not add exactly to 100 because of rounding.

ticularly marked for large loans, apparently occurred between 1954 and 1959. An earlier NBER study suggests that such a shift had been occurring since the 1920's. Data from this study indicate that loans originated in the years prior to 1947 were even less likely to be fully amortizing than loans authorized in 1954. Of the conventional multi-family and nonresidential loans included in a sample of loans held by life insurance companies in 1947, some 34 per cent of the loans, but only about 19 per cent of the loan amounts outstanding, were fully amortizing, showing that larger loans were less likely to be fully amortizing.<sup>15</sup>

<sup>15</sup> J. E. Morton, *Urban Mortgage Lending: Comparative Markets and Experience*, Princeton for NBER, 1956, pp. 75, 150-151.

*Prepayment of Loan Principal.* Contracts of most loans in the survey contained conditions under which prepayment of loan principal could occur. In the absence of such an agreement in the contract, borrowers cannot make any prepayment without the lenders' consent.<sup>16</sup> In cases where prepayment was permitted, a penalty usually could be charged by the lender if the option was exercised.<sup>17</sup>

TABLE 3-12. Number of Years During Which No Principal Prepayment Was Permitted

Closed Period (years)	3rd Quarter 1954		4th Quarter 1959		3rd Quarter 1963		1st Quarter 1965	
	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent
No closed period	254	68.3	239	43.8	312	43.6	306	39.3
1	57	15.3	20	3.7	93	13.0	128	16.4
2	5	1.3	3	0.5	6	0.8	3	0.4
3	10	2.7	24	4.4	31	4.3	20	2.6
4	1	0.3	1	0.2	2	0.3	3	0.4
5	38	10.2	197	36.1	188	26.3	207	26.6
6	1	0.3	1	0.2	2	0.3	2	0.3
7	0	—	19	3.5	21	2.9	51	6.5
8 and over	6	1.6	42	7.7	61	8.5	59	7.6
All loans	372	100.0	546	100.0	716	100.0	779	100.0

NOTE: Percentages may not add exactly to 100 because of rounding.

Prepayment of loan principal can be either partial or full. Partial prepayments are made whenever a borrower increases his periodic repayments of principal in excess of the required amount. Prepayment in full occurs if a borrower pays off his loan in one lump sum before maturity. This usually happens when a borrower refinances his loan while retaining possession of the property, or when he sells the property.<sup>18</sup> Prepayment arrangements followed a similar pattern for loans made by all fifteen companies. In each of the later three quarters, about six-tenths of all loans for which this kind of information was available had a "closed period" during which no prepayment of

<sup>16</sup> See Robert H. Pease and Lewis O. Kerwood (eds.), *Mortgage Banking*, 2nd ed., New York, 1965, pp. 25-26.

<sup>17</sup> The prepayment penalty is often waived if the borrower refinances with the same lender, or in case of sale, if the new owner arranges a loan with the original lender.

<sup>18</sup> See Hoagland and Stone, pp. 90-91, for a more complete discussion of loan prepayment.

TABLE 3-13. Per Cent Penalty for Prepayment in Full in Seventh Year

Penalty (per cent)	3rd Quarter 1954		4th Quarter 1959		3rd Quarter 1963		1st Quarter 1965	
	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent
0	86	23.1	12	2.2	10	1.4	11	1.4
1	95	25.5	5	0.9	9	1.3	14	1.8
2	114	30.6	157	28.8	160	22.3	107	13.7
3	22	5.9	151	27.7	269	37.6	266	34.1
4	2	0.5	19	3.5	78	10.9	79	10.1
5	—	—	23	4.2	42	5.9	69	8.9
6	—	—	46	8.4	—	—	2	0.3
7	—	—	—	—	1	0.1	—	—
Prepayment in full not permitted in seventh year	53	14.2	133	24.4	147	20.5	231	29.7
All loans	372	100.0	546	100.0	716	100.0	779	100.0

NOTE: Percentages may not add exactly to 100 because of rounding.

The penalty ordinarily applies only to prepayments exceeding 10 to 20 per cent of outstanding principal.

TABLE 3-14. Number and Per Cent of Loans by Loan Amount and Liability of Borrower (*loan amounts in \$000*)

	3rd Quarter 1954 Loan Amount				4th Quarter 1959 Loan Amount			
	Under 100	100- 499	500- 1999	2000 & Over	Under 100	100- 499	500- 1999	2000 & Over
<i>Liable:</i>								
Number of loans	167	95	13	5	191	181	36	4
Per Cent of loans	78.4	56.9	46.4	35.7	80.6	67.3	55.4	22.2
<i>Not liable:</i>								
Number of loans	46	72	15	9	46	88	29	14
Per Cent of loans	21.6	43.1	53.6	64.3	19.4	32.7	44.6	77.8
All loans	213	167	28	14	237	269	65	18

principal could be made. In these later periods, the closed period was five years or less on about nine-tenths of the loans containing such restrictions (see Table 3-12).

If a loan was not closed for any period or if the closed period had passed, most loan contracts permitted a percentage of the outstanding principal (usually 10 to 20 per cent), in addition to regular amortization payments, to be paid back each year without penalty. Also, if there were no closed period or if the closed period had passed, the borrower was permitted to prepay the loan in full, but only by paying a penalty calculated as a per cent of the outstanding loan balance. This per cent penalty became smaller each year; after about ten years had elapsed there was usually no penalty for prepayment.

In the present survey, a record was made of the per cent penalty in the seventh year of loan life. The figures in Table 3-13 indicate this penalty for prepayment of principal in excess of the 10 to 20 per cent which does not require a penalty. In the seventh year of loan life, between one-half and two-thirds of the loans authorized in the later three quarters had prepayment penalties of between 2 and 4 per cent. Tables 3-12 and 3-13 indicate that prepayment of loan principal was considerably less costly to borrowers in 1954 than in the other three periods.

**BORROWER LIABILITY.** Lenders look primarily to the size and certainty of the income stream in evaluating loans on income properties. However, they also carefully analyze the characteristics of the borrower

3rd Quarter 1963 Loan Amount				1st Quarter 1965 Loan Amount			
Under 100	100- 499	500- 1999	2000 & Over	Under 100	100- 499	500- 1999	2000 & Over
96	252	111	12	80	237	71	17
77.4	70.2	59.7	26.1	74.1	58.8	36.6	27.0
28	107	75	34	28	166	123	46
22.6	29.8	40.3	73.9	25.9	41.2	63.4	73.0
124	359	186	46	108	403	194	63

and usually make him liable on the note. In addition to when the borrower is specifically exempted from liability, he was not considered to be liable in this study if a special corporation had been set up to own the mortgaged property, which property was the corporation's only asset. This device was often resorted to even by parent manufacturing companies building new industrial plants or warehouses. In this study, the borrower was liable on about two-thirds of the loans for which this information was available.

Borrowers were more likely to be personally liable on small loans than on large ones as Table 3-14 shows. For example, in 1965 liability extended to nearly three-fourths of the loans under \$100,000, but to just over one-fourth of the loans of \$2 million and over.

It should be noted that even though a borrower is not liable, the lender is not indifferent to his identity and characteristics. If a lender has had prior dealings with a borrower, or if the latter is financially strong or has a reputation for developing successful projects, the lender will undoubtedly take this into account in evaluating the loan application.<sup>19</sup>

The importance of financial strength in obtaining large loans is shown in Table 3-15. This table includes only loans on which borrowers were

TABLE 3-15. Average Borrower Net Worth by Loan Amount and Quarter for Liable Borrowers (\$000)

Loan Amount (\$000)	3rd Quarter 1954	4th Quarter 1959	3rd Quarter 1963	1st Quarter 1965
Under 100	268	421	377	469
100-499	1,058	1,576	1,897	1,374
500-1,999	4,207	2,587	4,147	3,176
2,000 and over	5,014	23,229	14,141	19,700
All loans	747	1,217	2,177	2,290

liable and indicates a marked difference in average borrower net worth for large as opposed to small loans. For the later three quarters, average net worth of borrowers was between \$14 million and \$23 million for

<sup>19</sup> See *A Handbook for FHA Multifamily Projects*, Washington, D.C., Federal Housing Administration, 1965, pp. 288-290; Pease and Kerwood, pp. 235, 261; and Maisel, pp. 219-223. In discussing the importance of borrower characteristics, it is not clear if these authors refer to those who are or those who are not liable. It appears that much of what they say would be applicable in either case:

loans \$2 million and over. For loans under \$100,000, average net worth of borrowers was less than \$500,000 in all four quarters.

### *Size and Certainty of Income*

The terms of the loan transaction discussed above are all subject to bargaining between lenders and borrowers. Since some terms are more important to lenders and others are more important to borrowers, the bargaining could result in trade offs.<sup>20</sup>

The willingness of lenders to grant more liberal terms, or to trade off some terms against others, will also be influenced by the size and certainty of the income stream generated by the property securing the mortgage. But the lender can only assess the income stream; he cannot control it.

Information could not be obtained, in this survey, on all of the attributes of a property which a lender considers in evaluating the size and certainty of its income. For example, data were not available on the reliability of the expense prediction, the likelihood of competitive construction, the stability of the area in which the property was located, or the quality of property management.<sup>21</sup> Two of the property characteristics for which information could be obtained are discussed below.

**PROPERTY TYPE.** Lending on a variety of income properties (apartments, office buildings, shopping centers) involves differing degrees of risk. This is mainly because a more stable demand for services is generated by some types of properties than by others. As a result, some property types are more rapidly subject to obsolescence than others.

The characteristics of loans made on different property types reflect this difference in risk. Although the average loan terms for different properties shown in Table 3-16 vary from quarter to quarter,

<sup>20</sup> "One factor that makes bargaining possible is that certain conditions have different values to the borrower and the lender. Their tax situations may be entirely dissimilar. The length of their time horizons may differ radically. As an example, if a borrower is primarily interested in his cash flow rather than his accounting costs or eventual equity, he may find it well worthwhile to accept a higher interest rate in trade for lower amortization payments. The lender may be in exactly the opposite position. Thus a bargain becomes possible." Maisel, p. 343.

<sup>21</sup> *The Appraisal of Real Estate*, 4th ed., The American Institute of Real Estate Appraisers, Chicago, 1964, p. 281.

TABLE 3-16. Average Interest Rate, Loan-Value Ratio, and Maturity by Property Type and Quarter

Property Type	3rd Quarter 1954			4th Quarter 1954			3rd Quarter 1959			3rd Quarter 1963			1st Quarter 1965		
	Inter- est Rate	Loan- Value Ratio	Matu- rity (years)	Inter- est Rate	Loan- Value Ratio	Matu- rity (years)	Inter- est Rate	Loan- Value Ratio	Matu- rity (years)	Inter- est Rate	Loan- Value Ratio	Matu- rity (years)	Inter- est Rate	Loan- Value Ratio	Matu- rity (years)
Elevator apartments	4.47	65.2	17.3	6.13	62.9	19.3	5.88	66.5	21.6	5.96	69.9	22.6	5.96	69.9	22.6
Nonelevator apartments	4.94	61.6	15.9	6.19	63.5	18.9	5.99	66.4	20.2	6.01	69.0	20.7	6.01	69.0	20.7
Hotels and motels	5.00	47.8	13.8	6.44	54.4	14.4	6.05	58.8	16.3	6.32	64.7	16.3	6.32	64.7	16.3
Retail stores	4.61	59.1	15.0	6.03	62.2	15.7	5.70	63.3	17.6	5.72	67.3	17.6	5.72	67.3	17.6
Shopping centers	4.70	60.7	18.5	6.17	61.0	18.4	5.81	65.5	20.2	5.77	69.7	21.5	5.77	69.7	21.5
Office buildings	4.53	61.0	15.4	6.08	63.4	15.4	5.78	66.1	18.4	5.80	71.2	19.2	5.80	71.2	19.2
Medical office buildings	4.82	60.8	14.7	6.14	62.6	16.2	5.81	68.6	18.8	5.90	70.5	17.9	5.90	70.5	17.9
Warehouses	4.65	61.7	15.0	6.05	65.8	14.8	5.79	67.7	16.6	5.81	69.7	18.0	5.81	69.7	18.0
Industrial properties	4.61	59.4	13.9	6.17	63.5	15.4	5.78	64.2	16.2	5.81	68.8	18.2	5.81	68.8	18.2
Misc. commercial properties	4.67	63.7	15.2	6.11	62.4	13.6	5.74	65.2	15.3	5.74	68.5	18.0	5.74	68.5	18.0
Institutional properties	4.62	38.2	14.5	6.18	44.1	16.3	5.86	53.3	19.0	6.10	56.5	16.9	6.10	56.5	16.9
All loans	4.72	60.0	15.3	6.14	62.9	17.0	5.88	65.7	19.0	5.91	68.8	19.5	5.91	68.8	19.5

the property types maintain roughly the same relative position with respect to the liberality and restrictiveness of terms. Hotels and motels, the demand for whose services is most uncertain,<sup>22</sup> had the most restrictive terms in all four quarters. Such properties as retail stores, shopping centers, office buildings, and warehouses had more liberal terms because of their stable stream of income.

LONG-TERM LEASES. In addition to a generally more stable demand for their services, the income of some properties is backed by tenants

TABLE 3-17. Number of Loans by Per Cent of Gross Income Accounted for by Long-Term Leases: First Quarter 1965

Property Type	Per Cent of Gross Income Backed by Long-Term Leases				
	0	1-49	50-99	100	Total
Elevator apartments	50	0	0	0	50
Nonelevator apartments	319	0	0	3 <sup>a</sup>	322
Hotels and motels	20	0	0	1 <sup>a</sup>	21
Retail stores	9	3	2	44	58
Shopping centers	1	5	15	2	23
Office buildings	29	12	9	52	102
Medical office buildings	6	1	2	4	13
Warehouses	8	0	8	53	69
Industrial properties	5	0	3	47	55
Miscellaneous commercial properties	7	1	0	24	32
Institutional properties	16	0	0	10	26
All loans	470	22	39	240	771

NOTE: Long-term leases are those whose duration is at least one-half the maturity of the loan.

<sup>a</sup> Since it is unlikely that tenants of these two types of properties would have a lease for at least half the loan maturity, a more probable explanation is that the loans were made to the owner of the fee simple who had leased the entire property to a third party to operate.

with long-term leases. In these cases, the credit rating of the tenants is/as important to lenders as is that of the borrowers.<sup>23</sup> In the present

<sup>22</sup> For an extensive discussion of this point see Royal Shipp and Robert Moore Fisher, "The Postwar Boom in Hotels and Motels," a Federal Reserve Staff Economic Study (see *Federal Reserve Bulletin*, December 1965, p. 1703).

<sup>23</sup> See *The Appraisal of Real Estate*, pp. 246-247, for a discussion of the tenant characteristics in which lenders are interested.



study, information was obtained about the share of estimated gross income from the property that was backed by leases extending for at least one-half of the loan maturity.

As Table 3-17 shows, apartments seldom have any of their projected income backed by long-term leases although at the time the structure is completed, in the case of new properties, a good share of the project may have been rented to tenants with short-term leases. Hotels and motels, which in effect have occupants with one-day leases, are even more vulnerable to shifts in demand.<sup>24</sup> Small properties, usually with a single tenant, such as retail stores, warehouses, and industrial plants, had long-term leases accounting for 100 per cent of their income in most cases—nearly four-fifths in 1965. Most loans in the survey had either all or none of their estimated income backed by long-term leases. Only office buildings and shopping centers had an appreciable number of properties with long-term leases covering from 1 to 99 per cent of estimated gross income.

Leases have a substantial effect on interest rates as is shown by Table 3-18. Generally, interest rates on retail properties, office

TABLE 3-18. Average Interest Rates by Selected Property Type and Per Cent of Income Backed by Long-Term Leases

	Per Cent of Gross Income Backed by Long-Term Leases							
	3rd Quarter 1954		4th Quarter 1959		3rd Quarter 1963		1st Quarter 1965	
	0%	100%	0%	100%	0%	100%	0%	100%
Retail properties	4.70	4.52	6.14	6.03	5.83	5.62	5.84	5.66
Office buildings	4.73	4.46	6.14	6.07	5.85	5.55	5.94	5.72
Warehouses and industrial plants	4.73	4.60	6.12	6.11	5.82	5.75	5.82	5.77

NOTE: The property types included in this table are a combination of some of the types shown in Table 3-17 above. They are grouped this way to provide a contrast between loans with no income and those with 100 per cent of income backed by long-term leases.

buildings, and warehouses and industrial properties were higher in cases where long-term leases were absent than in cases where long-term leases accounted for all of the gross income.

<sup>24</sup> See Shipp and Fisher, p. 10.

### *Over-All Measures of Credit Risk*

This section will discuss the debt coverage ratio and the capitalization rate. These two ratios seem to be useful as over-all measures of the credit risk of individual mortgages.

**DEBT COVERAGE RATIO.** In evaluating the income stream of a property, lenders are primarily concerned with its ability to service the mortgage.<sup>25</sup> The debt coverage ratio is one measure of a property's ability to produce sufficient income to service the mortgage loan. This ratio has been calculated here by dividing the estimated net income from the property (after operating expenses, property taxes, and a vacancy allowance but before depreciation, debt service payments, and income taxes) by the amount of the required debt payments, including principal and interest.<sup>26</sup> For example, a DCR of 1.00 indicates that after paying operating expenses and property taxes, the estimated income is just sufficient, on the average, to meet the debt payments.

Average DCR for all loans was higher in 1954 (1.57) than in the later periods, all of which were about the same (just over 1.40). In all of the quarters, from three-fourths to four-fifths of the loans had DCRs between 1.13 and 1.62 (see Table 3-19).

Although the net income figure used in calculating DCRs is presented as a constant amount per year for an indefinite period, the actual amount realized will usually fluctuate from year to year.<sup>27</sup> Debt coverage ratios are higher on loans for which the income stream is thought to be more variable. In other words, lenders adjust the size of DCR they require to account for the certainty of the income stream. Table 3-20 shows that the average DCRs are lower for loans with all of their estimated income assured by long-term leases.

<sup>25</sup> For a discussion of the problem of debt service, see Leo Grebler, *Experience in Urban Real Estate Investment*, New York, 1955, pp. 141-156.

<sup>26</sup> This ratio could only be derived for loans which were fully amortizing with uniform payments and for which the estimate for net income was available. The information was available for from 70 to 75 per cent of loans in the later three quarters and for around 50 per cent in 1954.

<sup>27</sup> See *ibid.*, pp. 150-156. The data presented by Grebler indicate that income available for debt service from particular income properties showed a great deal of variance during the period between 1920 and 1950. The average net income for the period was more than sufficient to meet debt charges in nearly every case studied. But the actual income was not sufficient to meet the debt service requirements for some particular year (or years) in every case. Grebler described the situation as being an "... inherent conflict between fixed debt charges and fluctuating net income." (P. 148.)

TABLE 3-19. Frequency Distribution of Debt Coverage Ratios

Debt Coverage Ratio	3rd Quarter 1954		4th Quarter 1959		3rd Quarter 1963		1st Quarter 1965	
	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent
Under 1.00	10	4.2	13	2.6	6	1.0	5	0.8
1.00-1.12	32	13.5	36	7.2	40	6.9	63	9.6
1.13-1.24	25	10.5	68	13.7	63	10.8	77	11.7
1.25-1.37	37	15.6	166	33.4	156	26.8	179	27.2
1.38-1.49	30	12.7	72	14.5	151	25.9	169	25.6
1.50-1.62	28	11.8	65	13.1	97	16.7	86	13.1
1.63-1.74	22	9.3	22	4.4	28	4.8	28	4.2
1.75-1.99	19	8.0	29	5.8	21	3.6	33	5.0
2.00 and over	34	14.3	26	5.2	20	3.4	19	2.9
All loans	237	100.0	497	100.0	582	100.0	659	100.0

NOTE: Percentages may not add exactly to 100 because of rounding.

TABLE 3-20. Average Debt Coverage Ratios by Selected Property Type and Per Cent of Income Backed by Long-Term Leases

	Per Cent of Gross Income Backed by Long-Term Leases							
	3rd Quarter 1954		4th Quarter 1959		3rd Quarter 1963		1st Quarter 1965	
	0%	100%	0%	100%	0%	100%	0%	100%
Apartments	1.63	—	1.42	—	1.44	—	1.45	—
Retail properties	1.52	1.39	1.47	1.29	1.51	1.34	1.51	1.30
Office buildings	1.52	1.41	1.47	1.30	1.47	1.32	1.36	1.27
Warehouses and industrial plants	1.83	1.40	1.38	1.26	1.33	1.33	1.31	1.33
All loans	1.71	1.35	1.47	1.31	1.45	1.36	1.47	1.32

See note to Table 3-18.

**CAPITALIZATION RATE.** Much of the information available to lenders about the size and degree of certainty of the income stream of a property could not be obtained for a study such as this. It appears from the survey data that it may be possible to use the capitalization rate as a proxy for the characteristics for which information is not available. As the authors of a recent book said, the capitalization rate is determined by

TABLE 3-21. Average Capitalization Rates by Property Type and Quarter

	3rd Quarter 1954	4th Quarter 1959	3rd Quarter 1963	1st Quarter 1965
Elevator apartments	7.5	8.6	8.1	8.2
Nonelevator apartments	8.5	8.1	8.1	8.3
Hotels and motels	13.1	12.0	12.6	12.3
Retail stores	8.0	8.1	8.1	7.9
Shopping centers	7.4	8.2	8.1	8.1
Office buildings	7.5	8.5	8.3	8.2
Medical office buildings	8.9	9.3	7.9	8.7
Warehouses	8.0	8.5	8.1	8.3
Industrial properties	8.5	8.5	8.6	8.6
Miscellaneous commercial properties	8.4	9.0	8.3	8.0
Institutional properties	9.1	10.5	10.2	9.5
All loans	8.3	8.5	8.2	8.4

the characteristics of the property to be appraised. . . . In this respect it also measures the quantity, quality, and possible duration of the income stream. . . . It will probably be difficult to find any single property that combines all the most desirable features of an ideal investment, that is, absolute security of principal, ready marketability, adequacy and certainty of returns, good location, tax free income, good financing, probability of capital appreciation, etc. However, as the particular type of property approaches most closely these favorable features, the rate of capitalization will be lower.<sup>28</sup>

The capitalization rate used in this study was calculated by dividing estimated net income from the property by the property value. This is usually referred to as the "over-all" capitalization rate. It assumes that the property will not increase or decrease in value during the time the loan is outstanding.<sup>29</sup>

Capitalization rates were relatively constant for the four quarters studied. The average for 1963 was 8.2 per cent and for 1959 was 8.5 per cent with the other two quarters within that narrow range (see Table 3-21). Rates for most property types also varied within a relatively

<sup>28</sup> S. A. Kahn, F. E. Case, and A. Schimmel, *Real Estate Appraisal and Investment*, New York, 1963, pp. 122-123.

<sup>29</sup> See *The Appraisal of Real Estate*, p. 274. For a method of adjusting capitalization rates for the effect of appreciation or depreciation in the value of the property, see L. W. Elwood, *Elwood Tables for Real Estate Appraising and Financing*, New Jersey, 1959, pp. 191-204.

TABLE 3-22. Average Interest Rate, Maturity, Loan-Value Ratio, and Debt Coverage Ratio by Capitalization Rate

Capitalization Rate (per cent)	3rd Quarter 1954			4th Quarter 1954			3rd Quarter 1963			1st Quarter 1965						
	Inter- est Rate	Loan- Value Ratio	DCR	Inter- est Rate	Loan- Value Ratio	DCR	Inter- est Rate	Loan- Value Ratio	DCR	Inter- est Rate	Loan- Value Ratio	DCR				
Under 7.1	4.55	16.4	61.9	1.24	6.04	17.5	61.4	1.14	5.63	19.4	66.8	1.10	5.66	21.3	68.7	1.14
7.1-7.6	4.59	16.0	67.4	1.25	6.10	18.9	65.8	1.29	5.89	20.2	67.5	1.30	5.79	20.5	70.9	1.26
7.7-8.0	4.71	14.7	60.0	1.49	6.13	17.3	63.8	1.34	5.84	19.8	66.6	1.39	5.87	20.3	69.8	1.33
8.1-8.4	4.66	15.1	55.7	1.70	6.13	16.4	63.3	1.33	5.84	19.2	65.7	1.45	5.90	19.9	69.8	1.39
8.5-9.0	4.72	15.0	59.2	1.59	6.18	16.4	61.8	1.45	5.94	18.7	65.2	1.49	5.98	19.5	68.0	1.47
9.1-9.9	4.82	14.7	56.1	1.77	6.29	15.8	61.5	1.52	5.99	16.2	61.8	1.59	5.97	18.2	65.7	1.60
10.0 and over	4.89	14.2	55.4	2.36	6.29	14.2	57.2	2.02	6.05	16.6	61.9	1.97	6.12	16.2	67.8	1.87
All loans (including those for which capitalization rate was not available)	4.72	15.3	60.0	1.57	6.14	17.0	62.9	1.43	5.88	19.0	65.7	1.43	5.91	19.5	68.8	1.41

small range. The major exceptions were institutional properties and hotels and motels, which had rates considerably above the other property types in all four quarters.

Table 3-22 indicates that capitalization rates are related to other loan characteristics. Loans whose property income streams are capitalized at low rates have lower interest rates, lower debt coverage ratios, higher loan-value ratios, and longer maturities. Thus, viewing the capitalization rate as a summary measure of credit risk, these relationships show that lenders "reward" low risk borrowers with liberal terms and low interest rates.

### Appendix A

Life Insurance Companies Included in NBER Survey, Ranked by Asset Size (\$000,000)

Company	Total Assets End of 1966	Mortgage Loans Owned End of 1966
1. Prudential	23,512	8,836
2. Metropolitan	23,595	9,993
3. Equitable	12,576	5,515
4. New York Life	9,169	2,583
5. John Hancock	8,380	2,805
6. Connecticut General	3,635	1,413
7. Mutual of New York	3,318	842
8. Mutual Benefit	2,257	1,050
9. Connecticut Mutual	2,250	855
10. Penn Mutual	2,203	758
11. National Life and Accident (Nashville)	1,374	475
12. Phoenix Mutual	1,184	453
13. National Life (Montpelier)	1,178	583
14. Provident Mutual	1,038	373
15. Fidelity Mutual	488	134
Total—15 companies	96,157	36,688
Total of all U.S. life insurance companies	167,022	64,609
Per cent of total held by 15 companies	57.6%	56.8%

SOURCE: *Moody's Bank and Finance Manual*, New York, 1967, and *Life Insurance Fact Book*, New York, Institute of Life Insurance, 1967.

**Appendix B****EXPLANATION OF PROPERTY TYPES IN THE STUDY**

1. Elevator apartment—multifamily residential project of five or more units with at least one elevator. Includes only conventionally financed properties.
2. Nonelevator apartment—same as above with no elevators.
3. Hotels and motels.
4. Retail stores—includes bakeries, barber shops, beauty parlors, dress shops, drug stores, showrooms, supermarkets, delicatessens, department stores, and all other retail stores and shops.
5. Shopping centers—must have five or more stores.
6. Office buildings—includes regular office buildings, loft buildings, bank buildings, savings and loan association buildings, and life insurance company buildings.
7. Medical office buildings—includes office buildings occupied solely by doctors and dentists, and clinics.
8. Warehouses—in addition to regular warehouses, includes industrial grain elevators and storage silos.
9. Industrial properties—includes production and assembly buildings in all manufacturing industries as well as dry cleaning plants, laundries, and miscellaneous light manufacturing buildings.
10. Miscellaneous commercial properties—this category includes types for which there were not sufficient loans in any period to justify a separate category. These are post office buildings, garages, service stations, restaurants, bowling alleys, and other miscellaneous commercial properties.
11. Institutional properties—religious properties such as churches, Sunday schools, tabernacles, synagogues, convents, monasteries, theological seminaries, funeral parlors, crematories, mausoleums, mission houses; educational properties such as elementary and secondary schools, college buildings, libraries and museums, fine arts buildings; hospitals including infirmaries, sanatoriums, nurseries and nursing homes, institutions for the elderly; and social and recreational properties such as assembly buildings, auditoriums, community houses, golf and country clubhouses, athletic and social clubs, lodges, theaters, music conservatories, radio broadcasting studios, gymnasiums, indoor stadiums, indoor arenas, indoor coliseums, indoor courts, indoor swimming pools, locker buildings, YMCA buildings, bathhouses at beaches, billiard rooms, dance halls, indoor rinks, exhibit buildings, and other social and recreational buildings.