Credit Risk

IN ITS formulation of a credit policy an industrial banking company strives, first, to acquire a body of loans sufficiently large to assure effective utilization of its lending capacity, and, second, to select these loans so carefully that credit losses may be kept at a minimum. The problem of attaining these ends is complicated by the fact that loans are relatively small, so that decisions concerning a large number of bor-rowers are constantly to be made, and also by the fact that the decisions must be reached speedily. Credits, in such circumstances, must be passed within about twenty-four hours; on the other hand, bad-debt losses must be kept down to something like 1 percent of the volume of all loans made.

Except in regard to a loan secured by a savings passbook, no company can tell with certainty whether a borrower will pay his obligation promptly and in full or will involve the company in collection difficulties. Potential collection ex-pense is thus expressed in terms of probabilities: a credit officer will reject an application of a given type if it appears to him, on the basis of whatever experience, fact and intui-tive perception he can bring to bear on the situation, that the probable expense to be incurred is greater than the probable gross income to be earned on the loan.

When a borrower is an old customer with a tested credit record the problem of risk selection is greatly simplified, but with newcomers, whether customers or comakers, the credit officer's information is likely to be relatively incomplete and his responsibilities are augmented accordingly. Like other consumer credit agencies, the industrial banking com-

pany requires each loan applicant to fill out a form which provides information about himself, the loan he desires, and his comaker or whatever other security he offers. The same type of information, though less exhaustive in detail, is usually required of the comaker. This information is sought presumably because it provides either directly or indirectly certain facts concerning the borrower's characteristics— moral, personal, vocational and financial—which enable the credit officer to gauge what the payment record will probably be.

The moral characteristics of a borrower, or his willingness to pay, are indicated principally by his past payment record; his personal characteristics by age, sex, marital status, number of dependents and permanence of residence; his vocational characteristics by the industry in which he is employed, his position in that industry and the permanence of his employment; and his financial status by his income and by whatever information can be assembled as to his assets and liabilities. Other factors to be considered are the relation between the amount of the loan and the applicant's income, the use he intends to make of the funds, and the kind and quality of security he can provide to protect the loan. All of these factors are necessarily interrelated, and from the credit officer's point of view they are all to be weighed and considered in combination.

The present chapter attempts by statistical methods to ascertain the significance, as indicators of credit risk, of these various kinds of information supplied by customers of industrial banking companies.

PROCEDURE IN THE ANALYSIS OF CREDIT RISK

The data used in the preparation of this study were transcribed from a sample of 1,322 applications for loans which

were granted by 2 large Morris Plan banking companies
and by 8 other industrial banking companies. The con-
tributing institutions were asked to provide random samples
of "good" and "bad" loans. Good loans were defined as those
which paid out without collection difficulty, in other words,
loans to borrowers who, on the basis of their payment record,
would readily be granted another loan. Bad loans were held
to be those which culminated in default, or involved legal
action for collection, with the result that the borrower's
record would clearly not warrant the extension of another
loan.

The selection of the random samples was subject to only
two conditions: first, that the good and bad loans should
have been made within the same period of time; and sec-
ond, that their distributions over that period should have
been nearly identical. Although there is no certainty that the
drawing was actually random in the strict sense of the term,
the conclusions must necessarily be based on the assump-
tion that it was. The information transcribed from the loan
application blanks pertained only to financial, personal and
vocational factors. Since no data were taken on the so-called
moral factors affecting credit risk—past payment record,
legal actions in which the applicant had been involved, the
quality of references given, and the like—it has been im-
possible to estimate directly the statistical relevance of such
information. Indications of moral risk may be inferred from
the data only in so far as they are suggested by such charac-
teristics as permanence of residence and occupation.

The data obtained from loan application blanks are pre-
sented here in the form of tables giving the distributions
of the good-loan and bad-loan samples according to the
several characteristics of the borrowers. These tabulations
not only indicate the relative significance of these various
factors as indicators of credit risk, but also provide the best
available description of the characteristics of the market for

industrial loans. In this latter connection only the distributions of the good-loan sample are relevant, for the great majority of industrial banking company's customers do liquidate their obligations as scheduled.

The good-loan and bad-loan samples used in this analysis are almost equal in size. Thus the former constitutes a much smaller proportion than the latter of the total group of borrowers which it represents. This fact does not, however, detract from the representativeness of the samples, which is conditioned by the absolute number of cases that each contains, and not by this number's ratio to the whole body of comparable loans.

It is essential in an analysis of this kind to introduce certain checks against sampling errors. The main problem is to determine whether, for any particular borrower characteristic, the difference between the distributions of the two samples is a real difference between good and bad loans, taken as a whole, or is merely the result of sampling error. In the present study the chi-square test of statistical significance has been used for this purpose.[1]

In each of the tables in this chapter variation in risk experience among different borrower classes is measured by what is termed an "index of bad-loan experience." This index is the ratio of the percentage of bad loans in any class to the percentage of good loans in the same class. In any particular table the ratio, or index, for all classes combined would be 1 (100 percent to 100 percent); thus a ratio of more than 1 for any class indicates that loans made to borrowers in that class are worse-than-average risks, and a ratio of less than 1 indicates that such loans are better-than-average risks.

The loans to which this analysis applies have been di-

[1] A 1 percent standard of statistical significance has been used. For a more detailed discussion of the chi-square test see National Bureau of Economic Research (Financial Research Program), *Commercial Banks and Consumer Instalment Credit*, by John M. Chapman and Associates (1940) pp. 114-15.

vided into three groups, according to the source of the data. On one group, Sample A, information was supplied by an industrial banking company in a metropolitan center of the Middle Atlantic region; on another, Sample B, the data came from a large industrial banking company in the South Atlantic region; the third group, Sample C, is a combination of eight small samples submitted by relatively small companies operating in as many different cities and seven states. In each of the tables figures are also given for the three samples combined; this is the only grouping for which the index of bad-loan experience is computed.

Two main qualifications should be mentioned in regard to the following analysis. In the first place, the loan samples, both good and bad, pertain of necessity only to persons whose loan applications have been approved, and therefore the data cannot be regarded as indicating anything about the various characteristics of loan applicants as a whole. In the second place, it cannot be concluded that it is unwise to make loans to all persons within any particular class that shows a considerably worse-than-average index of bad-loan experience. It is obvious that such a policy would eliminate some desirable as well as some undesirable borrowers, for no class is so bad that it contains only defaulting customers. In a sample of good loans only 2 percent of the borrowers might be in the age group of 21-25 years, and in a sample of bad loans 15 percent; but if all applicants of this age were rejected, while in the total group of applicants the good might be expected to outnumber the bad by 100 to 1, there would be 13 times as many good loans as bad loans refused.

The difference between the percentages of bad loans and the percentages of good loans in the entire group of classes containing worse-than-average risks—a difference which is equal to that between the percentages of good and bad loans in the average and better-than-average group of classes—is

the "index of distribution difference." This index measures the relative efficiency of each borrower characteristic as an indicator of credit risk. If the index is 100 the better-than-average group contains all the good loans and the worse-than-average all the bad loans, while if the index is 0 the good and bad loans have exactly the same distribution among the various classes. If the index is 100 rejection of loan applications in the worse-than-average classes would eliminate only bad loans, while if the index is 0, elimination of loans in any class would mean the rejection of equal percentages of good and of bad; but since good loans heavily outweigh the bad, such a procedure would result in the elimination of a much larger *number* of good than of bad loans. The closer the index of distribution difference stands to 100, the greater is the difference between the percentage of bad loans and the percentage of good loans that would be eliminated if a worse-than-average class were rejected.

BORROWER CHARACTERISTICS AS FACTORS IN CREDIT RISK

Personal Characteristics

As already noted, the samples of good and bad loans provide data on the following personal characteristics of borrowers: age, sex, marital status, number of dependents and duration of residence. Percentage distributions of the samples according to these five characteristics, and indices of bad-loan experience for each factor, are presented in Tables 26, 27, 28 and 29.

Table 26 indicates that a somewhat higher proportion of bad-loan than of good-loan borrowers from industrial banking companies are under 40 years of age, and that a considerably higher proportion of good-loan than of bad-loan borrowers are over 50. The index of bad-loan experience increases fairly consistently from 0.43 for this latter age

TABLE 26

PERCENTAGE DISTRIBUTION OF GOOD-LOAN AND BAD-LOAN SAMPLES, BY AGE OF BORROWER[a]

Sample	Age of Borrower							Total	Number of Loans	
	21–25 Years	26–30 Years	31–35 Years	36–40 Years	41–45 Years	46–50 Years	Over 50 Years		Reporting	Not Reporting
A Good	5.3	13.6	20.2	15.4	14.0	14.0	17.5	100.0	228	9
Bad	7.1	21.2	21.7	18.6	12.4	7.5	11.5	100.0	226	8
B Good	12.7	16.6	16.1	10.7	10.2	8.8	24.9	100.0	205	36
Bad	15.9	17.4	20.4	14.4	12.9	8.5	10.5	100.0	201	36
C Good	11.7	19.9	12.9	15.2	14.0	7.0	19.3	100.0	171	14
Bad	19.2	23.6	16.5	18.1	11.0	7.7	3.9	100.0	182	6
ALL SAMPLES										
Good	9.6	16.4	16.7	13.7	12.8	10.3	20.5	100.0	604	59
Bad	13.6	20.7	19.7	17.1	12.1	7.9	8.9	100.0	609	50
Index of bad-loan experience[b]	1.42	1.26	1.18	1.25	.95	.77	.43	1.00		
Index of distribution difference[c]								14.7		

[a] Based on information contained in 1,322 applications for loans, granted by an industrial banking company in a metropolitan center of the Middle Atlantic region (Sample A), an industrial banking company in the South Atlantic region (Sample B), and eight companies operating in eight different cities and seven states (Sample C).
[b] Ratio of bad-loan percentage to good-loan percentage. A ratio of more than 1 indicates worse-than-average experience, and a ratio of less than 1 indicates better-than-average experience.
[c] The difference between the bad-loan percentages and the good-loan percentages in the entire group of classes containing worse-than-average risks. The closer this index stands to 100, the greater is the percentage of bad loans, as compared with good loans, that would be eliminated if a worse-than-average class were rejected.

TABLE 27

PERCENTAGE DISTRIBUTION OF GOOD-LOAN AND BAD-
LOAN SAMPLES, BY MARITAL STATUS AND SEX OF
BORROWER[a]

Sample	Married		Single		Others[b]	Total	Number of Loans
	Men	Women	Men	Women			
A Good	59.5	8.0	12.7	14.3	5.5	100.0	237
Bad	62.4	4.3	23.5	5.1	4.7	100.0	234
B Good	51.1	11.2	9.1	8.7	19.9	100.0	241
Bad	56.1	5.5	9.7	3.0	25.7	100.0	237
C Good	72.4	2.2	10.8	4.9	9.7	100.0	185
Bad	70.2	2.7	16.5	3.7	6.9	100.0	188
ALL SAMPLES							
Good	60.0	7.5	10.9	9.7	11.9	100.0	663
Bad	62.4	4.2	16.5	4.0	12.9	100.0	659
Index of bad-loan experience	1.04	.56	1.51	.41	1.08	1.00	
Index of distribution difference						9.0	

[a] See footnotes to Table 26, p. 125.
[b] Includes persons widowed, divorced, separated or not reporting.

group to a high of 1.42 for borrowers between 21 and 25. This tendency is too marked to be attributed simply to errors in the drawing of the samples; also, it agrees in general with a tendency observed in regard to commercial bank personal loan borrowers.[2] It should be noted, however, that the apparent relation of borrower's age to bad-loan experience may be less a reflection of the direct effect of age on credit risk than of the indirect effect of other related factors such as occupation, income, marital status and the like.

Table 27, which presents distributions of the loan sam-

[2] *Ibid.,* Table 27, p. 120.

ples according to the sex and marital status of borrowers, suggests that well over half of all borrowers are married men and that about one-tenth are single men, while the proportions of married and single female borrowers are on the whole about equal. Married men, as a group, seem to have an approximately average record on loan performance, as is indicated by their index of 1.04. Single men, on the other hand, have an index of 1.51, which is somewhat worse than average. The indices for women, both married and single, show that they are better-than-average risks. The variations displayed in Table 27 cannot be considered to reveal a marked difference in the credit records of married and single persons, but they are sufficient to indicate a significant difference in credit experience on loans to men as compared with loans to women. This finding too is borne out by data on personal loans extended by commercial banks.[3] The better-than-average risk experience for women as compared with men may be attributable, however, to certain vocational characteristics of women borrowers. As will be shown below, credit experience on loans to wage-earners is worse than average, and the fact that few women borrowers are found in this class serves as a partial explanation of the findings drawn from Table 27.

It appears from Table 28 that the number of a borrower's dependents bears no significant relation to credit risk experience, and data on personal loans extended by commercial banks point to the same conclusion.[4] This does not mean, however, that the number of a person's dependents is a factor that can be ignored in selecting credit risks. Rather, it suggests that credit officials, in deciding upon applications for loans, give this factor sufficient consideration to make it relatively insignificant as an autonomous criterion.

[3] *Ibid.*, Table 28, p. 121.
[4] *Ibid.*, Table 29, p. 122.

TABLE 28

PERCENTAGE DISTRIBUTION OF GOOD-LOAN AND BAD-
LOAN SAMPLES, BY NUMBER OF BORROWER'S DE-
PENDENTS[a]

| Sample | Number of Dependents | | | | | | Number of Loans | |
	None	One	Two	Three	Four or More	Total	Reporting	Not Reporting
A Good	28.1	28.5	17.5	16.7	9.2	100.0	228	9
Bad	31.4	27.0	17.7	15.5	8.4	100.0	226	8
B Good	30.6	34.4	14.8	9.3	10.9	100.0	183	58
Bad	28.6	31.5	19.1	12.9	7.9	100.0	178	59
C Good	12.1	34.2	28.2	15.4	10.1	100.0	149	36
Bad	13.6	28.6	21.4	22.8	13.6	100.0	154	34
ALL SAMPLES								
Good	24.6	32.0	19.5	13.9	10.0	100.0	560	103
Bad	25.6	28.8	19.2	16.7	9.7	100.0	558	101
Index of bad-loan experience	1.04	.90	.98	1.20	.97	1.00		
Index of distribution difference						3.8		

[a] See footnotes to Table 26, p. 125.

Table 29 indicates that the great majority of borrowers have lived at least 3 years in the same place. In Samples B and C only a handful of borrowers reported a residence of less than 3 years, and while it may be assumed that some proportion of the relatively high numbers not reporting at all on this item would fall in these classes of shorter residence, it is most unlikely that there would be enough to contradict the pattern noted here. It is not clear from an examination of the loan data whether the number of years given refers to length of residence in the same city or

TABLE 29

PERCENTAGE DISTRIBUTION OF GOOD-LOAN AND BAD-LOAN SAMPLES, BY DURATION OF BORROWER'S RESIDENCE[a]

Sample	Years of Residence[b]							Number of Loans	
	Under 1	1-2	2-3	3-6	6-10	10 or More	Total	Reporting	Not Reporting
A Good	5.3	4.0	8.0	26.2	20.9	35.6	100.0	225	12
Bad	2.8	10.2	11.2	27.0	27.4	21.4	100.0	215	19
B Good	..	..	..	11.5°	7.1	81.4	100.0	113	128
Bad	..	..	..	25.0°	13.9	61.1	100.0	72	165
C Good	..	..	..	10.3°	6.2	83.5	100.0	97	88
Bad	..	..	..	34.4°	6.2	59.4	100.0	96	92
ALL SAMPLES									
Good	3.4	2.8	5.7	15.9	14.0	58.2	100.0	435	228
Bad	3.1	8.6	8.9	21.4	19.6	38.4	100.0	383	276
Index of bad-loan experience	.91	3.07	1.56	1.35	1.40	.66	1.00		
Index of distribution difference							20.1		

[a] See footnotes to Table 26, p. 125.
[b] Number of years of residence in the same city. Each level is inclusive of the lower figure and exclusive of the higher.
[c] Includes all borrowers who reported a residence of less than 6 years. Distribution of borrowers in the first three classes was not computed because of the small number reporting; these three classes were not consolidated, however, in computing the distribution of all samples or in computing the index of bad-loan experience.

at the same address, but it is obviously safe to assume the former meaning. Thus the distributions of all three samples indicate that persons who have resided 10 years or more in the same city are better-than-average risks. This conclusion too might have to be modified if information were available from the non-reporting borrowers, but that it is fairly reliable is suggested by the fact that also in an analysis of commercial bank personal loan customers the index of bad-loan experience was found to vary inversely with duration of residence.[5]

Vocational Characteristics

The data on vocation which the samples make available for analysis pertain to the nature of the borrower's occupation, the industry in which he is employed and the permanence of his occupational status. Such factors are, of course, like personal, moral and financial characteristics of industrial banking company borrowers, closely interrelated with other borrower data.

Certain difficulties are encountered in attempting to classify these loan samples according to the borrower's occupational and industrial status. In many instances this information is not reported on the loan application blank and in other cases the statements are ambiguous. Some of the loans carrying an ambiguous statement can be assigned to particular classes, but in general the meagerness of information leads to the assignment of a relatively large proportion of the loans to a miscellaneous category. Moreover, since the total sample of loans is small it is necessary to classify borrowers into relatively few, and therefore not very specific, industrial and occupational groups.

The occupational distribution of the samples, presented in Table 30, indicates that clerical and wage-earning groups provide the majority of industrial banking company bor-

[5] *Ibid.*, Table 30, p. 122.

TABLE 30

PERCENTAGE DISTRIBUTION OF GOOD-LOAN AND BAD-LOAN SAMPLES, BY OCCUPATION OF BORROWER[a]

Sample	Professional Workers	Clerical Workers				Proprietors	Managers and Officials	Wage-Earners		Miscellaneous[b]	Total	Number of Loans
		Office Workers	Outside Salesmen	Other	Total			Skilled Labor	Other			
A Good	16.0	10.1	5.1	11.4	26.6	19.5	13.9	6.3	8.0	9.7	100.0	237
Bad	10.3	6.0	6.4	16.7	29.1	13.6	15.8	6.0	18.8	6.4	100.0	234
B Good	6.6	17.4	2.9	14.1	34.4	6.7	7.1	15.3	13.7	16.2	100.0	241
Bad	5.5	13.9	10.6	8.8	33.3	10.2	7.6	14.3	17.7	11.4	100.0	237
C Good	4.3	11.4	6.5	10.8	28.7	8.7	6.5	22.7	20.5	8.6	100.0	185
Bad	2.7	6.9	12.2	9.6	28.7	13.8	6.4	19.7	24.5	4.2	100.0	188
ALL SAMPLES												
Good	9.3	13.1	4.7	12.2	30.0	11.8	9.3	14.2	13.6	11.8	100.0	663
Bad	6.4	9.1	9.6	11.8	30.5	12.4	10.2	12.9	20.0	7.6	100.0	659
Index of bad-loan experience	.67	.69	2.04	.97	1.02	1.05	1.10	.91	1.47	.64	1.00	
Index of distribution difference											12.8	

[a] See footnotes to Table 26, p. 125.
[b] Includes those not reporting occupation.

rowers, each of these occupations accounting for about 30 percent of the total number of borrowers in these samples. In 1935-36, according to estimates of the National Resources Planning Board, wage-earners constituted 52.9 percent of the entire non-farm population, and clerical workers 20.3 percent.[6] Thus the industrial banking companies covered in these samples appear to have a larger proportion of clerical workers in their total group of borrowers, and a considerably lower proportion of wage-earners, than is characteristic of the total non-farm population.

The indices of bad-loan experience suggest that the professional class, the clerical class of typists, stenographers, accountants and other office workers, and the group of miscellaneous occupations are better-than-average risks, and that the clerical group of outside salesmen and commercial representatives is a substantially worse-than-average credit risk; wage-earners other than skilled laborers are also worse than average, though less notably. The other classes—skilled labor, managers and officials, proprietors and the clerical workers as a unit group—appear to have about an average record of loan performance. Comparable analysis of commercial bank personal loan samples confirms these findings, on the whole.[7]

In Table 31, which presents distributions of the samples according to the borrower's industrial affiliation, it has been necessary to assign an even greater proportion of the loans to the category of miscellaneous. Public service, with an index of 0.47, is the only industrial group which this analysis indicates as consisting of substantially better-than-average risks. The group of miscellaneous transportation workers, with an index of 2.21, has a credit standing that is much worse than average. Other industrial classes which are relatively important, in terms of their ratios to the total numbers

[6] National Resources Planning Board, *Consumer Incomes in the United States* (1938) Table 10B, p. 97.
[7] John M. Chapman and Associates, *op. cit.,* Table 31, p. 124.

TABLE 31

PERCENTAGE DISTRIBUTION OF GOOD-LOAN AND BAD-LOAN SAMPLES, BY INDUSTRIAL AFFILIATION OF BORROWER[a]

| Sample | Utilities[b] | Professional Service | Public Service | Trade | | | Manufacturing | Service Trades[d] | Miscellaneous Transportation[e] | Building Trades[f] | Miscellaneous[g] | Total | Number of Loans |
				Wholesale and Retail	Other[c]	Total							
A Good	5.5	6.7	13.1	16.9	17.3	34.2	14.8	8.0	2.5	.4	14.8	100.0	237
Bad	14.5	6.4	4.7	13.2	17.9	31.1	14.1	10.7	4.3	1.3	12.9	100.0	234
B Good	12.9	2.1	14.9	9.5	12.1	21.6	16.6	5.8	2.5	2.9	20.7	100.0	241
Bad	14.3	2.5	9.3	11.8	12.6	24.4	18.6	5.9	3.8	3.0	18.2	100.0	237
C Good	14.1	2.2	8.6	10.3	10.3	20.6	28.6	4.9	2.1	3.2	15.7	100.0	185
Bad	11.2	2.1	3.2	7.5	11.7	19.2	34.0	7.5	8.5	.5	13.8	100.0	188
ALL SAMPLES													
Good	10.6	3.8	12.5	12.4	13.4	25.8	19.3	6.3	2.4	2.1	17.2	100.0	663
Bad	13.5	3.8	5.9	11.1	14.3	25.4	21.4	8.0	5.3	1.7	15.0	100.0	659
Index of bad-loan experience	1.27	1.00	.47	.90	1.07	.98	1.11	1.27	2.21	.81	.87	1.00	
Index of distribution difference												10.5	

[a] See footnotes to Table 26, p. 125.
[b] Railroad, bus and steamship transportation, communication (other than postal), gas and electric utilities.
[c] Real estate, insurance, advertising, printing and publishing, banking and brokerage, etc.
[d] Domestic and personal services: laundries, cleaning, hotels, restaurants, barbers, etc.
[e] Taxi and trucking service, garage service, auto repair, filling stations, etc.
[f] Building and maintenance of roads, shipbuilding, etc.
[g] Includes those not reporting industrial affiliation.

in the sample—for example, manufacturing, trade and the miscellaneous group—are all nearly average-risk groups.

Table 32 gives the percentage distributions of the good and bad loans in the various samples according to the number of years the borrower has been employed in his present position. This tabulation suggests about the same conclusions as did Table 29, on duration of residence; it conforms also with findings derived from commercial bank personal loan samples.[8] Borrowers whose tenure of employment is 10 years or more appear to be notably better-than-average risks, their index of bad-loan experience being only 0.53; from that level the index rises consistently to 2.24 for those employed in their present positions for less than a year. The interdependence of different borrower characteristics is well illustrated by duration of employment: younger persons tend to fall in the shorter tenure groups, and older persons in the longer tenure groups, and, as was shown in Table 26, younger borrowers have a considerably worse record of loan performance than older borrowers.

Financial Characteristics

Distribution of the loans according to borrower income, shown in Table 33, reveals marked differences in the three individual samples. In Sample A only 3 percent, while in Samples B and C nearly one-fourth, of the borrowers had incomes of less than $1200 a year. More than 80 percent of the borrowers in Samples B and C had incomes of less than $2400, while well under half of those in Sample A were in this class. It might be noted also that Sample A borrowers, in contrast to those in Samples B and C, are fairly evenly distributed through the higher income levels.

The income-level variation of the index of bad-loan experience is not statistically significant. This is the same conclusion as that drawn from an analysis of commercial bank

[8] *Ibid.,* Table 33, p. 127.

TABLE 32

PERCENTAGE DISTRIBUTION OF GOOD-LOAN AND BAD-LOAN SAMPLES, BY DURATION OF BORROWER'S EMPLOYMENT[a]

Sample	Years of Employment[b]							Number of Loans	
	Under 1	1–2	2–3	3–6	6–10	10 or More	Total	Reporting	Not Reporting
A Good	5.5	6.4	3.2	19.1	18.6	47.2	100.0	220	17
Bad	6.6	10.9	8.0	25.9	25.9	22.7	100.0	212	22
B Good	4.3	5.5	6.1	15.4	19.6	49.1	100.0	163	78
Bad	17.8	9.2	7.5	20.1	16.1	29.3	100.0	174	63
C Good	5.5	11.0	7.3	18.3	18.3	39.6	100.0	164	21
Bad	10.7	21.3	13.6	19.5	13.6	21.3	100.0	169	19
ALL SAMPLES									
Good	5.1	7.5	5.3	17.8	18.8	45.5	100.0	547	116
Bad	11.4	13.5	9.5	22.2	19.1	24.3	100.0	555	104
Index of bad-loan experience	2.24	1.80	1.79	1.25	1.02	.53	1.00		
Index of distribution difference							21.2		

[a] See footnotes to Table 26, p. 125.
[b] Number of years of employment in present position. Each level is inclusive of the lower figure and exclusive of the higher.

TABLE 33

PERCENTAGE DISTRIBUTION OF GOOD-LOAN AND BAD-LOAN SAMPLES, BY INCOME OF BORROWER[a]

Sample	Annual Income[b]							Total	Number of Loans	
	Under $1200	$1200-1800	$1800-2400	$2400-3000	$3000-3600	$3600-4800	$4800 and Over		Reporting	Not Reporting
A Good	3.2	12.4	27.7	15.7	15.2	10.1	15.7	100.0	217	20
Bad	2.9	17.5	33.0	16.0	11.2	10.2	9.2	100.0	206	28
B Good	22.7	32.0	26.7	9.8	5.3	2.2	1.3	100.0	225	16
Bad	28.4	28.9	21.6	9.3	5.9	3.4	2.5	100.0	204	33
C Good	23.8	30.8	29.1	7.6	4.6	2.9	1.2	100.0	172	13
Bad	21.1	40.0	20.0	12.6	2.3	2.9	1.1	100.0	175	13
ALL SAMPLES										
Good	16.1	24.8	27.7	11.2	8.6	5.2	6.4	100.0	614	49
Bad	17.3	28.2	25.1	12.7	6.7	5.6	4.4	100.0	585	74
Index of bad-loan experience	1.07	1.14	.91	1.13	.78	1.08	.69	1.00		
Index of distribution difference								6.5		

[a] See footnotes to Table 26, p. 125.
[b] Each level is inclusive of the lower figure and exclusive of the higher.

personal loans,[9] but it is contrary to the findings arrived at in studies of personal finance company and sales finance company credit experience.[10] An important reason for the smaller significance of borrower's income in analyses of banking credit experience is the fact that banking institutions, in contrast to personal finance companies, extend the great majority of their personal loans on comaker or single-name notes, without collateral security; sales finance companies, of course, deal almost entirely in retail instalment credit, for which the commodity purchased serves as security. Thus the banking institutions are constrained to give greater emphasis to the applicant's financial position, and it may be assumed that risk selection at the time of application eliminates the most questionable cases. Factors that indicate the stability of income—such as the nature of a borrower's occupation and the duration of his employment—are therefore revealed as more significant criteria for an analysis of actual experience than is income itself.

In view of the differences in the income distributions of the three individual samples it is not surprising to find, in Table 34, substantial variations also in regard to size of loan. Sample A, which has the smallest percentage of low-income borrowers, has also the smallest percentage of loans amounting to less than $100. The indices of bad-loan experience do not reveal a significant relationship between size of loan and credit risk, except perhaps for loans of less than $100, which seem to be associated with a worse-than-average credit experience. This result accords with that found for commercial bank personal loans,[11] but it is at variance with the finding in regard to personal finance com-

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[9] *Ibid.*, Table 34, p. 128.
[10] National Bureau of Economic Research (Financial Research Program), *Personal Finance Companies and Their Credit Practices,* by Ralph A. Young and Associates (1940) pp. 96-99, and *Sales Finance Companies and Their Credit Practices,* by W. C. Plummer and R. A. Young (1940) pp. 180-83.
[11] John M. Chapman and Associates, *op. cit.,* Table 37, p. 133.

TABLE 34

PERCENTAGE DISTRIBUTION OF GOOD-LOAN AND BAD-LOAN SAMPLES, BY AMOUNT OF NOTE[a]

Sample	Amount of Note[b]								Number of Loans	
	Under $100	$100– 200	$200– 300	$300– 400	$400– 500	$500– 1000	$1000 and Over	Total	Report- ing	Not Report- ing
A Good	1.7	28.3	18.6	20.2	6.7	17.3	7.2	100.0	237	..
Bad	6.1	35.5	21.7	17.7	4.3	13.0	1.7	100.0	231	3
B Good	13.3	44.2	19.6	12.5	2.1	8.3	..	100.0	240	1
Bad	18.1	35.0	20.3	10.6	4.6	11.4	..	100.0	237	..
C Good	14.1	51.3	19.5	10.8	4.3	..	..	100.0	185	..
Bad	21.5	40.9	19.4	11.8	6.4	..	..	100.0	186	2
ALL SAMPLES										
Good	9.4	40.5	19.2	14.8	3.3	9.5	3.3	100.0	662	1
Bad	14.8	36.9	20.5	13.5	4.3	8.8	1.2	100.0	654	5
Index of bad-loan experience	1.57	.91	1.07	.91	1.30	.93	.36	1.00		
Index of distribu- tion difference								7.7		

[a] See footnotes to Table 26, p. 125.
[b] Each level is inclusive of the lower figure and exclusive of the higher.

pany credit risk.[12] In the latter study it was found that credit experience is best on loans of less than $100 and progressively worse on loans of larger size, except those of $300.

The relationship between the amount of a loan and the borrower's income might be expected to be of some significance as an indicator of credit risk, but Table 35 does not bear out this hypothesis. It appears, indeed, that the best credit experience is associated with loans that amount to 20 percent or more of borrower's income. These findings do not mean, however, that the note-to-income ratio may be disregarded. What was pointed out in regard to income and number of dependents seems to be true here too: in the original selection of borrowers this factor was given sufficient weight to make it relatively insignificant as an explanation of actual credit losses. That a fairly conservative credit policy was followed is evident also from the fact that roughly three-fourths of the borrowers received loans amounting to less than 15 percent of their income.

Table 36 presents data on all the items of borrower assets and liabilities on which information was available from the samples. Each of the three asset items reported on—bank account, life insurance and real estate—appears to be significantly related to credit experience, and this finding is confirmed by the study of commercial bank personal loans.[13] Samples A and C provide information on the borrower's liability status with regard to other instalment accounts, but since the distributions of their good and bad loans are noticeably dissimilar it is unlikely that any weight can be attached to this credit factor. Their composite index of bad-loan experience does show that borrowers who were indebted on instalment accounts when they were granted their loans were worse-than-average risks, and that borrowers not so encum-

[12] Ralph A. Young and Associates, *op. cit.*, pp. 103-05.
[13] John M. Chapman and Associates, *op. cit.*, Table 36, p. 131.

TABLE 35

PERCENTAGE DISTRIBUTION OF GOOD-LOAN AND BAD-LOAN SAMPLES, BY AMOUNT OF NOTE IN PERCENT OF BORROWER'S ANNUAL INCOME[a]

Sample	Amount of Note in Percent of Borrower's Income						Number of Loans	
	Under 5 Percent	5-9 Percent	10-14 Percent	15-19 Percent	20 Percent or More	Total	Report-ing	Not Report-ing
A Good	5.1	43.0	29.2	10.2	12.5	100.0	216	21
Bad	11.8	43.6	29.9	10.0	4.7	100.0	211	23
B Good	13.9	35.4	24.7	10.8	15.2	100.0	223	18
Bad	10.7	38.8	22.9	13.3	14.3	100.0	196	41
C Good	12.4	38.8	28.2	11.8	8.8	100.0	170	15
Bad	16.3	41.3	18.6	13.9	9.9	100.0	172	16
ALL SAMPLES								
Good	10.3	39.1	27.3	10.8	12.5	100.0	609	54
Bad	12.8	41.3	24.2	12.2	9.5	100.0	579	80
Index of bad-loan experience	1.24	1.06	.89	1.13	.76	1.00		
Index of distribution difference						6.1		

[a] See footnotes to Table 26, p. 125.

TABLE 36

PERCENTAGE DISTRIBUTION OF GOOD-LOAN AND BAD-LOAN SAMPLES, BY SELECTED ASSET AND LIABILITY ITEMS OF BORROWER[a]

Sample	Bank Account			Life Insurance			Real Estate			Instalment Account		
	Yes	No	Number[b]	Yes	No	Number[b]	Yes	No[c]	Number[d]	Yes	No	Number[b]
A Good	34.2	65.8	234	77.2	22.8	237	24.5	75.5	237	17.4	82.6	236
Bad	19.2	80.8	229	71.5	28.5	228	10.7	89.3	234	13.4	86.6	231
B Good	..	..	..	..	..	..	22.8	77.2	241	..	..	..
Bad	..	..	..	..	..	..	16.9	83.1	237	..	..	..
C Good	33.3	66.7	84	89.4	10.6	113	23.8	76.2	185	43.3	56.7	104
Bad	20.7	79.3	92	75.4	24.6	114	14.4	85.6	188	71.0	29.0	124
ALL SAMPLES												
Good	34.0	66.0	318	81.1	18.9	350	23.7	76.3	663	25.3	74.7	340
Bad	19.6	80.4	321	72.8	27.2	342	14.0	86.0	659	33.5	66.5	355
Index of bad-loan experience	.58	1.22		.90	1.44		.59	1.13		1.32	8.9	
Index of distribution difference		14.4			8.3			9.7			8.2	

[a] See footnotes to Table 26, p. 125.
[b] Number of those reporting information on this item.
[c] Includes those not reporting on real estate holdings.
[d] Total number of loans in sample.

bered were better-than-average risks, but the variation is not sufficiently marked to constitute an important finding.

LOAN CHARACTERISTICS AS FACTORS IN CREDIT RISK

Loan size as a possible risk factor has already been discussed in connection with the relation of income to credit experience. There are other loan characteristics, however—type of security, length of contract and, less directly, intended use of funds—which are pertinent to an analysis of risk.

TABLE 37

PERCENTAGE DISTRIBUTION OF GOOD-LOAN AND BAD-LOAN SAMPLES, BY TYPE OF SECURITY[a]

Sample	Single-Name	1 Co-maker	2 Co-makers	3 or More Co-makers	Other[b]	Total	Number of Loans
A Good	17.3	11.8	46.8	24.1	..	100.0	237
Bad	18.0	9.8	48.3	22.2	1.7	100.0	234
B Good	11.6	37.8	40.2	7.5	2.9	100.0	241
Bad	12.7	30.4	33.3	18.6	5.0	100.0	237
C Good	14.1	12.4	56.8	11.3	5.4	100.0	185
Bad	1.1	17.6	48.9	22.3	10.1	100.0	188
ALL SAMPLES							
Good	14.3	21.4	47.2	14.5	2.6	100.0	663
Bad	11.2	19.4	43.1	21.0	5.3	100.0	659
Index of bad-loan experience	.78	.91	.91	1.45	2.04	1.00	
Index of distribution difference						9.2	

[a] See footnotes to Table 26, p. 125.
[b] Includes those not reporting on type of security.

Table 37 shows that in Samples A and B single-name notes appeared in the good- and bad-loan groups with about equal frequency, and that in Sample C they appeared much more frequently in the good-loan than in the bad-loan group. This finding is particularly interesting in view of the current tendency for industrial banking companies to increase the proportion of their total loans extended on the sole security of the maker's name.[14] It would appear that when such loans are made, sufficient care is taken in the choice of risks to yield an average, or even a much better-than-average, credit experience. With regard to comaker notes all that can be said on the basis of the present samples is that loans secured by one or two comakers constitute the bulk of the loans in each individual sample, and that credit experience tends to become worse as the number of comakers increases. These general findings are confirmed by the study of commercial bank personal loans.[15]

Table 38 presents a distribution of the samples according to the number of months allowed for repayment. Notes contracted to run for 12 months account for practically all of the loans in Sample A and for about 75 percent of the loans in the three samples combined. Analysis of the data in this table reveals no significant relation between credit experience and contractual maturity.

It is customary to require a borrower to indicate on his application the use to which the proceeds of the loan are to be put. It is difficult, however, to make a satisfactory classification of loans according to this characteristic, because borrowers' statements as to the intended use of the funds may be unreliable and are often ambiguous. Also, in many

[14] In some cases single-name notes are "husband and wife" notes. The basic characteristic of the "single-name" loan is that it is secured by the name of only one income-earner.
[15] John M. Chapman and Associates, *op. cit.*, Table 38, p. 134.

TABLE 38

PERCENTAGE DISTRIBUTION OF GOOD-LOAN AND BAD-LOAN SAMPLES, BY LENGTH OF LOAN CONTRACT[a]

Sample	Length of Contract						Number of Loans	
	1–6 Mos.	7–11 Mos.	12 Mos.	13–17 Mos.	Over 17 Mos.	Total	Report-ing	Not Report-ing
A Good	..	.4	99.2	.4	..	100.0	237	..
Bad	1.7	..	97.9	.4	..	100.0	231	3
B Good	7.5	11.6	61.0	6.6	13.3	100.0	241	..
Bad	7.0	13.2	52.6	10.5	16.7	100.0	228	9
C Good	3.4	19.2	64.4	2.3	10.7	100.0	177	8
Bad	5.6	10.1	71.4	1.7	11.2	100.0	178	10
ALL SAMPLES								
Good	3.7	9.6	75.7	3.2	7.8	100.0	655	8
Bad	4.7	7.5	74.3	4.4	9.1	100.0	637	22
Index of bad-loan ex-perience	1.27	.78	.98	1.38	1.17	1.00		
Index of dis-tribution difference						3.5		

[a] See footnotes to Table 26, p. 125.

instances the loan is applied to several different purposes. Thus the classification in Table 39 is not to be taken too literally. From the data here presented it seems that loans to finance tax payments result in the best credit experience, and that loans to pay for the purchase of clothes result in the worst experience. Loans in these two categories, however, account for very small proportions of the total number. For the classes containing the largest percentage of cases—the refinancing of bills and miscellaneous uses—credit experience appears to be about average.

TABLE 39

PERCENTAGE DISTRIBUTION OF GOOD-LOAN AND BAD-LOAN SAMPLES, BY INTENDED USE OF FUNDS[a]

Sample	Taxes	Vaca-tion	House-hold	Help for Rela-tive	Medi-cal and Dental	Busi-ness	Cloth-ing	Consoli-dation of Debts	Miscel-laneous[b]	Total	Number of Loans
A Good	5.1	3.8	12.6	8.8	8.9	15.2	1.3	13.1	31.2	100.0	237
Bad	3.0	3.9	5.1	5.1	20.1	9.4	5.6	17.5	30.3	100.0	234
B Good	4.1	°	6.2	1.7	4.6	2.9	°	62.7	17.8	100.0	241
Bad	1.3	°	4.2	3.4	8.0	8.4	°	55.3	19.4	100.0	237
C Good	4.9	°	4.9	°	6.5	4.3	°	17.8	61.6	100.0	185
Bad	.5	°	5.3	°	8.0	8.0	°	31.9	46.3	100.0	188
ALL SAMPLES											
Good	4.7	1.8	8.2	4.1	6.6	7.7	.9	32.4	33.6	100.0	663
Bad	1.7	1.4	4.9	3.6	12.3	8.6	2.7	35.2	29.6	100.0	659
Index of bad-loan ex-perience	.36	.78	.60	.88	1.86	1.12	3.0	1.09	.88	1.00	
Index of distribution dif-ference										11.2	

[a] See footnotes to Table 26, p. 125.
[b] Includes those not reporting on intended use of funds.
[c] Loans included in the "miscellaneous" group, because of the small number reporting; the classes were not consolidated, however, in computing the distribution of all samples or in computing the index of bad-loan experience.