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Volume Author/Editor: Albert M. Wojnilower

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Chapter Author: Albert M. Wojnilower

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3

Examiner Criticism Rates in Relation to Industry and Size of Borrower

The bank examination data provide the most detailed information so far available on the differences in risk that banks incur when lending to businesses of various industries and sizes. These data reflect the judgment of experienced credit appraisers, based on highly confidential information ordinarily available to no one but the lending bank. In this section we shall see what these appraisals have to say about differences in risk among industries and size of borrower groups.

The basic "risk matrix" derived from the examiners' evaluations is presented in Table 4, which shows, for each industry and size cell, the percentage of total loans outstanding that was criticized in 1957, both by dollar amount and by number. The underlying figures from which these ratios are computed are given in the Appendix.

The most immediately striking feature of this table is perhaps the remarkable degree of diversity among the criticism rates for the various industry and size cells. In dollar volume, the percentage of loans criticized by the examiners ranges from zero (no loans criticized) for four of the twenty-seven industry and size groupings to over 20 per cent for small retail firms and small firms in the utility-transport group.[1] Moreover, the criticism rates differ widely both within and between industries and within and between size classes. Thus, the rate for small retail firms

[1] Indeed, according to the table all loans to small utilities were criticized, but this odd result is probably due to the smallness of the sample of uncriticized loans. Criticized loans were enumerated in full; four of these (out of a total of 716) were found to be loans to small utilities. Uncriticized loans, however, were sampled, but of the 4,121 loans in the sample (representing an estimated total of 18,356 uncriticized loans) not one happened to have been made to small utilities.

TABLE 4

PERCENTAGE OF LOANS CRITICIZED BY EXAMINERS, BY INDUSTRY AND SIZE OF FIRM, 1957

Industry	*Size of Borrower*			
	Large	Medium	Small	All Firms[a]
	BASED ON DOLLAR AMOUNTS			
Utilities and transportation	0	0.20	100.00[b]	0.09
Wholesale trade	2.94[b]	0.66	2.20	1.01
Services	0.53	3.51	3.10	1.15
Finance	0.18	1.56	1.62	1.31
Sales finance companies	0[b]	1.36	1.57	0.82
Construction	0.11	2.43	0[b]	1.32
Nondurables manufacturing	0	2.33	0.67	1.90
Durables manufacturing	1.77	2.60	4.61	2.71
Retail trade	1.76	6.59	21.33	3.39
All other and unidentified	0[b]	0.53	18.25[b]	3.38
All industries criticism rate	0.69	2.14	2.41	1.76
Total amount of loans (mil.)	$1,279	$1,218	$326	$3,221
	BASED ON NUMBER OF BORROWERS			
Utilities and transportation	0	2.95	100.00[b]	2.58
Wholesale trade	1.30[b]	0.78	3.72	1.80
Services	0.72	4.39	8.33	4.16
Finance	3.05	3.94	15.66	4.91
Sales finance companies	0[b]	3.33	17.10	9.36
Construction	0.81	3.24	0[b]	3.14
Nondurables manufacturing	0	1.61	1.79	2.05
Durables manufacturing	1.99	2.70	2.50	2.74
Retail trade	3.52	8.02	7.69	6.71
All other and unidentified	0[b]	2.86	5.26[b]	6.15
All industries criticism rate	1.59	4.01	3.81	3.75
Total number of borrowers	1,728	8,214	5,177	19,072

SOURCE: Bank Examination Survey. For underlying figures, and definitions of industries and sizes, see Appendix.

[a] Includes firms of unknown size.

[b] Estimated number of all loans in cell is less than 100.

is more than ten times that for large retail firms. For large wholesale firms it is nearly 3 per cent, compared to zero for large firms in nondurable goods manufacturing. The criticism rate for the entire utilities groups is only 0.1 per cent, compared to 3.4 per cent for all loans to

retailers. And the rate for all loans to small firms is more than three times that for all loans to large firms.

Despite the great diversity among the criticism rates, however, the results are by no means disorderly. Significance tests performed on rank correlations for various groupings of the data demonstrate that the pattern of the rates is far from random.

We examine first the pattern of the rates based on dollar amounts. The cells within each size classification (large, medium, and small) were ranked according to their criticism rates. This yielded three independent rankings of industries, with the relative size of the borrower "held constant" in each case (see the upper panel of Table 5). While the three rankings differ substantially from one another when all the cells are considered, much of the difference is accounted for by the three cells that represent populations of less than 100 loans. When these cells are omitted, the correlation among the three sets of rankings, taken together, becomes significant at the 1 per cent level. Considering the rankings in pairs, the correlations between the rankings for large and small firms, and between those for large and medium firms, are significant at the 5 per cent level.

The data are consistent, therefore, with the hypothesis of systematic differences among industries in the frequency of examiner criticism of loans. Indeed, two industries—finance and nondurables manufacturing—appear consistently in the upper half of the ranking; that is, loans to firms in those industries are relatively infrequently criticized, regardless of their size. By contrast, loans to three other industries—durable goods manufacturing, services, and retail trade—have relatively high criticism rates within each size group.[2] Furthermore, some of the differences between the criticism rates for borrowers of differing sizes within the same industry may, in fact, reflect differences in type of business, rather than in size. The industry groupings employed in this study are rather broad; the large firms (with assets of over $100 million) in the utilities and transportation group, for example, certainly differ in kind as well as in size from the small firms, defined as those with assets of less than $50,000.

[2]This need not mean that the aggregate criticism rate for all borrowers in these industries must rank high or low; thus, nondurables rank low in the aggregate and services high. The aggregate ranking is affected also by the distribution of loans as between firms of different sizes, and by the incidence of criticism in the size-unknown category.

TABLE 5

RANKINGS OF INDUSTRY AND SIZE CELLS OF BORROWERS ACCORDING TO EXAMINER CRITICISM RATES

(based on dollar amounts; first rank corresponds to lowest criticism rate)

Industry	*Size of Borrower*			
	Large	Medium	Small	All Firms[a]
		WITHIN SIZE GROUPS		
Utilities and transportation	1.5[b]	1	8[c]	1
Wholesale trade	8[c]	2	4	2
Services	5	7	5	3
Finance	4	3	3	4
Construction	3	5	1[c]	5
Nondurables manufacturing	1.5[b]	4	2	6
Durables manufacturing	7	6	6	7
Retail trade	6	8	7	8
		WITHIN INDUSTRIES		
Utilities and transportation	1	2	3[c]	
Wholesale trade	3[c]	1	2	
Services	1	3	2	
Finance	1	2	3	
Construction	2	3	1[c]	
Nondurables manufacturing	1	3	2	
Durables manufacturing	1	2	3	
Retail trade	1	2	3	
All firms[a]	1	2	3	

SOURCE: Table 4.

[a] Includes firms of unknown size.
[b] Refers to tie. These cells had no criticized loans.
[c] Estimated number of all loans in cell is less than 100.

There is also a pronounced tendency for the incidence of examiner criticism to be lower for large borrowers than for medium-sized or small borrowers in the same industry (lower panel of Table 5). The only exceptions occur in two industries (wholesale trade and construction) in which the results are particularly unreliable because of the small number of loans involved in one of the cells. However, it does not follow that a loan to any small firm, whatever its industry, is always

more apt to draw criticism than a loan to a large firm. The criticism rate for loans to small firms in the finance industry, for example, is below that for loans to large firms in durable goods manufacturing or in retail trade.

As in the rankings isolating the influence of industry, the correlation among the orderings by size, with industry "constant," also fails to achieve significance until the cells representing less than 100 loans are removed, but does become significant (in this case at the 5 per cent level) when they are omitted. The correlation chiefly reflects the fact that criticism rates are clearly lower for large firms than for medium-sized firms. The ordering of criticism rates varies considerably between medium and small firms in the same industry, with no clear advantage for either size group.[3]

The weight of the evidence is that there are large differentials among criticism rates for the various industry and size cells, and that these differences are systematic and in fact significantly influenced by the industry to which the borrower belongs and by his relative size within that industry.

When the data are examined in terms of the number, rather than the dollar volume, of criticized loans, the relationships that emerge are somewhat different and a bit less systematic. An extreme example is the reversal of position of criticism rates on loans to small retailers and those to small finance companies. When dollar volumes were considered, loans to small finance companies ranked eleventh among the twenty-four cells for which industry and size of firm were known,

[3] Inspection of the results for borrowers of unknown size suggests that the criticism rates for small borrowers may be understated somewhat. In three of the four cases in which the criticism rate for small firms is lower than that for the large or the medium-sized firms in the same industry—services, construction, and nondurables manufacturing—the proportion of criticized loans for which the asset size of the borrower could not be ascertained was relatively high. As pointed out earlier, such information is most often missing from the credit files of the bank when the borrower is a small firm. This is confirmed by examination of the average size of the criticized loans outstanding to the borrowers of unknown size, which is uniformly less than that of criticized loans to medium-sized borrowers. Were we to designate, arbitrarily, half the criticized loans to borrowers of unknown size as loans to small firms and the other half as loans to medium firms, the advantage of the small firms for examiner criticism in nondurable goods manufacturing and construction would be substantially reduced, although not eliminated.

Some bias in the opposite direction is introduced by the fact that from time to time an examiner may spot and perhaps criticize a "suspicious" loan falling below the cut-offs. However, such instances are rare.

while small retail firms ranked twenty-third. By number, however, retail firms rank twenty-second, with a criticism rate only little more than half that for small finance firms, which rank twenty-third. In fact, for small borrowers, there was little correlation between the ranking of the criticism rates based on dollar amounts and that based on numbers of loans (for the latter, see Table 6). For medium-sized and large borrowers, however, the correlation between the dollar-amount and loan-number rankings (excluding those based on fewer than 100 loans) was just short of significance at the 5 per cent level. Moreover, the correlation between the two sets of rankings for all cells taken together was clearly significant at the 1 per cent level.

Considering separately the criticism rates based on loan numbers, ranked so as to "isolate" the effect of industry (upper panel of Table 6), we find the correlation among the three "within-size" rankings taken together to be significant at the 5 per cent level. The correlation between any two of the three rankings is positive, but not significant. As for the effect of size (lower panel of the table), the results are the same as for the rankings based on dollar amounts. Criticism rates are uniformly lower for large borrowers than for medium-sized or small firms, but there is no clear difference between the rates for medium-sized and small firms.

While for the analysis of cyclical and other economic effects the dollar measures perhaps are the more relevant, the broad pattern of the results thus holds for the rates based on loan numbers as well.[4]

Validity of Results

Although the foregoing results are interesting for their own sake, the fact remains that they only apply to a few banks in a few areas of the country for one year. In order to conclude that they have general

[4]For the aggregate of loans, but not for the industry divisions, criticism rates also were obtained for absolute asset-size groupings, as well as for the large-medium-small classification employed above. These are analyzed in the forthcoming report by Geoffrey H. Moore, Thomas R. Atkinson, and Edward J. Kilberg, "Risks and Returns in Small-Business Financing." Two features appear to be principally relevant to the present study: (1) some loans are criticized in every size class; not even borrowers with assets of over $100 million are exempt; (2) on the whole, the incidence of criticism tends to rise as the size of firm declines, but in several cases the relationship fails to hold between adjoining size classes. It may be that this irregularity of the progression is attributable to the interindustry differences in the incidence of examiner criticism revealed by the data presented here.

TABLE 6

RANKINGS OF INDUSTRY AND SIZE CELLS OF BORROWERS ACCORDING TO EXAMINER CRITICISM RATES

(based on number of borrowers; first rank corresponds to lowest criticism rate)

Industry	*Size of Borrower*			
	Large	Medium	Small	All Firms[a]
	WITHIN SIZE GROUPS			
Wholesale trade	5[b]	1	4	1
Nondurables manufacturing	1.5[c]	2	2	2
Durables manufacturing	6	3	3	3
Utilities and transportation	1.5[c]	4	8[b]	4
Construction	4	5	1[b]	5
Service	3	7	6	6
Finance	7	6	7	7
Retail trade	8	8	5	8
	WITHIN INDUSTRIES			
Wholesale trade	2[b]	1	3	
Nondurables manufacturing	1	2	3	
Durables manufacturing	1	3	2	
Utilities and transportation	1	2	3[b]	
Construction	2	3	1[b]	
Services	1	2	3	
Finance	1	2	3	
Retail trade	1	3	2	
All firms[a]	1	3	2	

SOURCE: Table 4.

[a] Includes borrowers of unknown size.
[b] Estimated number of all loans in cells is less than 100.
[c] Refers to tie. These cells had no criticized loans.

validity, we need to show that (1) the structure of these examiner criticism rates is a reasonably accurate representation of the true structure of default risks on loans to all business borrowers of various sizes and industries in 1957, and (2) the structure of such risks is reasonably stable from year to year or from cycle to cycle. It should be emphasized that these questions refer primarily to the pattern

of interrelationships among these rates and not to their levels. All previous studies of various types of credit risk have found the quality of credit to show cyclical changes, and there is no reason to suppose the behavior of bank loans differs in this respect. What is possible, however, is for the degree of risk associated with the various industry and size cells *relative to each other* to remain stable over time. At this point, anticipating our results, we may say that other data tend to confirm the risk structure suggested by the bank examination data, although by no means unqualifiedly or conclusively. These other data also indicate quite positively that the pattern of risks has been highly stable during the postwar period.

Ideally, to answer the questions just posed, the results from our limited sample should be checked against results for these banks in other years, and for other banks and other regions, as well as against other types of data relevant to the default risks of business borrowers from banks, cross-classified by industry and size of firm. Needless to say, the available data permit such verification only on the most restricted scale.

While the bank examination survey did obtain data cross-classified by industry and size of firm for criticized loans for 1953-56 (as well as for 1957), data for uncriticized loans, essential if criticism *rates* were to be developed, were obtained only for 1957. Nevertheless, some evaluation of the stability of the differentials in criticism rates among the various industry and size cells can be made by comparing the industry and size distribution of criticized loans from year to year, since over short periods the corresponding industry and size distribution of all loans is not likely to change much.[5]

The distribution of criticized loans for the sixty banks in our survey does in fact show a high degree of stability from year to year, both in dollar volume and numbers of loans (Table 7). This is particularly true when allowance is made for the tendency of the percentage shares in Table 7 to rise over time because of the gradual

[5] Of course, whether a change in the distribution is to be considered large or small depends on the context. Thus the decline that actually occurred between 1955 and 1957 in the small-business share of total loans may be considered large because it implies that the marginal distribution of loans (that is, the distribution of new loans) was lopsided in favor of large firms. On the other hand, the shift in loan composition may be considered small because it did not cause any radical change in the distribution of the loan aggregate, viewed as a whole. It is the latter viewpoint that is relevant here.

TABLE 7

DISTRIBUTION OF CRITICIZED LOANS BY INDUSTRY AND SIZE OF BORROWER, 1953-57

Industry		Percentage of All Criticized Loans					Percentage of Total Loans, Criticized and Uncriticized, 1957
		1953	1954	1955	1956	1957	
		BASED ON DOLLAR AMOUNTS					
Durable goods manufacturing	S	1	2	3	8	7	3
	M	11	15	12	13	16	10
	L	12	15	17	11	11	8
	U	14	5	5	3	5	1
		38	37	37	35	39	22
Nondurable goods manufacturing	S	1	2	1	2	2	4
	M	16	8	10	16	13	11
	L	4	3	7	3	5	9
	U	4	4	3	12	8	1
		24	17	22	33	28	25
Retail trade	S	a	a	a	a	1	a
	M	3	4	3	5	6	2
	L	3	2	2	2	4	5
	U	7	14	2	1	1	1
		12	20	8	8	12	8
Services	S	a	a	a	a	a	a
	M	1	2	1	1	2	1
	L	0	0	a	2	1	3
	U	11	6	4	1	a	1
		12	7	5	4	3	5
Construction	S	0	0	0	0	0	a
	M	a	a	a	a	a	1
	L	a	a	1	a	a	1
	U	1	a	2	2	1	1
		1	1	4	3	1	3
Wholesale trade	S	a	a	a	a	a	a
	M	1	1	a	1	1	3
	L	0	0	0	a	a	a
	U	2	a	a	a	a	a
		2	2	1	2	2	4

(*continued*)

TABLE 7 (continued)

Industry		Percentage of All Criticized Loans					Percentage of Total Loans, Criticized and Uncriticized, 1957
		1953	1954	1955	1956	1957	
Finance	S	[a]	2	5	1	2	3
	M	2	8	5	4	4	5
	L	1	2	2	2	[a]	6
	U	3	2	11	6	6	6
		7	14	22	13	13	20
Utilities and transportation	S	0	0	[a]	[a]	[a]	[a]
	M	[a]	[a]	[a]	[a]	[a]	5
	L	2	1	0	0	0	6
	U	1	[a]	[a]	[a]	[a]	1
		3	2	[a]	[a]	[a]	12
Industry unknown		1	1	[a]	1	1	1
Total		100	100	100	100	100	100
Total amount (millions)[b]		56.1	65.3	92.9	103.6	71.5	3,221.1
		BASED ON NUMBER OF LOANS					
Durable goods manufacturing	S	5	5	7	10	8	9
	M	3	4	4	4	4	5
	L	1	1	1	1	1	1
	U	10	4	4	4	2	1
		18	14	16	19	15	17
Nondurable goods manufacturing	S	4	5	4	6	5	10
	M	3	2	3	3	2	5
	L	[a]	[a]	[a]	[a]	[a]	1
	U	7	6	5	3	2	2
		14	13	12	12	10	17
Retail trade	S	3	3	3	2	3	2
	M	6	14	17	17	21	10
	L	1	1	2	2	2	2
	U	15	8	5	4	2	3
		24	26	27	26	28	17

(*continued*)

TABLE 7 (concluded)

Industry		Percentage of All Criticized Loans					Percentage of Total Loans, Criticized and Uncriticized, 1957
		1953	1954	1955	1956	1957	
Services	S	1	2	2	2	2	1
	M	4	5	5	6	7	5
	L	0	0	[a]	[a]	[a]	1
	U	13	11	8	5	4	4
		18	18	16	13	13	11
Construction	S	0	0	0	0	0	[a]
	M	1	2	2	3	4	4
	L	[a]	[a]	[a]	[a]	[a]	1
	U	4	3	3	2	2	2
		4	5	5	5	6	8
Wholesale trade	S	2	3	3	3	4	3
	M	1	1	1	2	2	5
	L	0	0	0	[a]	[a]	[a]
	U	3	3	2	1	[a]	1
		6	6	6	6	6	9
Finance	S	[a]	1	2	3	8	2
	M	2	3	3	3	4	3
	L	2	2	2	1	1	1
	U	4	4	4	3	2	4
		8	9	11	10	14	11
Utilities and transportation	S	0	0	[a]	[a]	1	[a]
	M	[a]	1	1	1	2	3
	L	[a]	[a]	0	0	0	1
	U	1	1	1	[a]	[a]	1
		1	2	2	1	3	5
Industry unknown		8	7	6	7	5	4
Total		100	100	100	100	100	100
Total number[b]		512	547	672	747	789	19,072

NOTE: S = small, M = medium, L = large, U = size unknown.

SOURCE: Bank Examination Survey.

[a] Less than 0.5 per cent.

[b] Because of the tabulating plan, criticized loans for all years include some loans not criticized in that particular year but during some other year in the span of the loan. The effect is to inflate both the number and amount of criticized loans.

shrinkage of the "size unknown" category. The latter is attributable to the nature of the sources. For 1957, data for criticized loans came from the individual loan cards prepared for every loan and from the listings of criticized loans in the actual examination reports. For earlier years, however, data were obtained primarily from the reports, in which the borrower characteristics are not given in as much detail. Data for before 1957 were available from the loan cards only for those loans still on the books in 1957. This explains why the proportion of "size unknown" loans rises progressively as the data go back in time, rather than all at once between 1957 and 1956.

No other studies of bank examination records against which our data might be tested exist,[6] nor are there any data that refer directly to defaults or delinquencies on business loans. We are forced, therefore, to fall back on other measures of business credit risk.

BANK LOSSES ON BUSINESS LOANS

A special survey of loss experience on business loans, including information for industry and size of borrower, was conducted by the Federal Reserve Bank of Chicago for 1957.[7] The results of the survey, made with the cooperation of banks holding 98 per cent of the relevant loans in the Seventh District, are given in Table 8.

Before comparing these data to the bank examination results, we point out the many reasons why they might show a different pattern. To begin with, the Chicago data refer to actually realized gross losses, and not to examiner criticism, which is largely an ex ante measure. Second, they are based on data for almost all Federal Reserve member banks in the district, rather than for a small sample of state member banks only. Third, the data, of course, refer to an entirely different

[6]The only other published research involving cross-sectional analysis of examiner criticism rates for bank loans, so far as we know, refers to the experience of country banks in the depression. See Fred L. Garlock and B. M. Gile, *Bank Failures in Arkansas*, University of Arkansas Agricultural Experimental Station, Bulletin No. 315, March 1935, and Fred L. Garlock, *Country Banking in Wisconsin During the Depression*, United States Department of Agriculture Technical Bulletin No. 777, July 1941.

[7]Mary T. Petty and Theodore H. Schneider, *Loan Loss Experience at Member Banks of the Seventh Federal Reserve District, 1957 and 1958*, Chicago, 1959. The Chicago Reserve Bank conducted surveys for 1957, 1958, and 1959, but experience with business loans classified by industry and size of firm was studied only for 1957.

Examiner Criticism Rates

TABLE 8

LOSSES ON BUSINESS LOANS AND CRITICISM RATES, BY INDUSTRY AND SIZE OF BORROWER, 1957

Size of Borrower[a]	All Businesses	Manufacturing and Mining	Retail Trade	Wholesale Trade	Sales Finance Companies	"All Other" Businesses
	A-1. GROSS LOSSES (DOLLARS) PER $100,000 OF OUTSTANDINGS,[b] SEVENTH (CHICAGO) FEDERAL RESERVE DISTRICT MEMBER BANKS, 1957					
All borrowers	83	79	194	31	11	92
Large	49	89	9	0	0	44
Medium	76	37	265	22	26	104
Small	153	167	433	112	3	186
Total loans outstanding (billion dollars)	5.5	2.4	0.6	0.4	0.6	1.5
	B-1. EXAMINER CRITICISM RATES (PER CENT) BASED ON DOLLAR AMOUNTS, 60 BANKS IN NEW YORK, PHILADELPHIA, AND ATLANTA FEDERAL RESERVE DISTRICTS					
All borrowers	1.76	2.29	3.39	1.01	0.82	1.02
Large	0.69	0.88	1.76	2.94[c]	0[c]	0.24
Medium	2.14	2.46	6.59	0.66	1.36	1.06
Small	2.41	2.45	21.33	2.20	1.57	5.42
Total loans outstanding (billion dollars)	3.2	1.5	0.2	0.1	0.4	0.9
	A-2. RANKS IN ORDER OF RISING LOSS RATES					
Large		9	4	1.5[d]	1.5[d]	8
Medium		7	14	5	6	10
Small		12	15	11	3	13
	B-2. RANKS IN ORDER OF RISING CRITICISM RATES					
Large		4	8	12[e]	1[e]	2
Medium		11	14	3	6	5
Small		10	15	9	7	13

NOTES TO TABLE 8

Totals include borrowers of unknown size or industry.

SOURCE: Loss data: Petty and Schneider, *Loan Loss Experience*, Table 5, and unpublished tabulations. Criticism rates: Bank Examination Survey.

[a] The "size of borrower" classification is the same as used in the Commercial Loan Surveys. It varies for different industries; for the detailed breakdown, see the Appendix.

[b] Average of outstandings at December 31, 1956, June 6, 1957, and December 11, 1957, call report dates.

[c] Estimated number of all loans in cell is less than 100.

[d] Refers to tie.

area of the country. Fourth, the industry groupings are different in part, with the loan aggregate being classified into five industry groupings rather than nine as in the bank examination data. While for purposes of comparison the bank examination data have been recombined into comparable industry classifications, it is quite possible that the industry mix in two of the groupings—total manufacturing and the catchall "all other" category—may differ considerably between the two sets of data. Fifth, the Chicago data include all loan losses, no matter how small the loan, while the bank examination data do not cover loans falling below the cut-offs.[8] Finally, the number of losses in many of the cells is so small that erratic variations are to be expected. The total number of business loan losses in 1957 in the Chicago District was only 421; and only ten of these occurred among borrowers with assets of $1 million or more which might be defined as large within their industries.

Given all these potential sources of divergence, the surprising result is that the rank correlation of 0.44 between the two sets of data is, after all, definitely significant at the 5 per cent level. Moreover, if the one cell that is most "out of line"—large wholesalers—is excluded, the correlation is raised to 0.58 and becomes significant at the 1 per cent level. (The bank examination data included one criticized loan and less than 100 total loans in this class; the Chicago data show no losses at all.)

[8] One quarter of the total number of losses involved borrowers with assets of less than $10,000 (Petty and Schneider, *Loan Loss Experience*, Table 8). Many of these loans would not have been appraised at all by the examiners.

Indeed, the general impression of "diversity with a pattern" that prevails for the bank examination data also holds for the Chicago experience. For Chicago, perhaps because there are fewer industry groupings, the pattern is somewhat more apparent.

Like the bank examination data, these figures strongly support the hypothesis that risk differs substantially according to industry and size of firm. This is most readily apparent from panel A-2 of Table 8, which ranks the various cells in order of the associated loss rate. Thus, the rank 15 at the bottom of the second column of this panel, which applies to small retail borrowers, means that these borrowers showed the highest gross loss rate of any of the fifteen cells into which the table is divided. Looking along the rows of the table, we see that the general order of industries is quite consistent from one size class to another. Again, however, there are significant exceptions. Notably, although loans to medium and small retailers have the highest loss rates in the medium and small size groups, loans to large retailers fared better than loans to large manufacturers or large firms in the "all other" group. Among the large loans, moreover, those to "all other" business had a better record than those to manufacturing, while for the medium and small borrowers in these two industries, as well as for the industries taken as a whole, manufacturing shows the better record. Finally, there is little choice between large finance and wholesale borrowers, and among medium finance companies, wholesalers, and manufacturers; differences in loss rates within these groups are nonexistent or negligible. Despite these exceptions to perfect order, however, the correlation among the three rankings of industries (with the size of borrower held constant) is significant at the 5 per cent level (but not at 1 per cent). The correlation between columns, measuring the effect of size when industry is held constant, also is significant at 5 per cent, though not at 1 per cent.

We conclude that the Chicago data strongly support the bank examination findings.[9]

[9] Additional evidence that banks incur relatively higher loss rates on loans to small business is given by Moore, Atkinson, and Kilberg in *Financing Small Business*, Washington, 1958, pp. 81-101. Utilizing 1957 data for commercial banks in another Federal Reserve District, they examined the relation between the proportion of loans to large, medium, and small-sized businesses (not differentiated by industry) in a bank's over-all loan portfolio and that bank's gross loss rate on total (including nonbusiness) loans. It was found, reflecting primarily the experience of the smaller banks, that a high proportion of loans to small business was associated

CREDIT RATINGS OF FIRMS, BY INDUSTRY AND SIZE OF FIRM

As another part of the National Bureau's Quality of Credit Program, data on the incidence of favorable and unfavorable credit ratings, by industry and size of firm, were developed from the Dun and Bradstreet reference books by Victor Zarnowitz.[10] Like examiners' ratings of bank loans, credit ratings should, in effect if not in intent, predict which types of borrowers are unlikely to meet their obligations. We might therefore expect a close degree of correspondence between the frequency of examiner criticism and the frequency of inferior credit ratings for particular industry and size groups.

Unfortunately, the two sets of data are not comparable in so many respects that a true test of this proposition is impossible. To begin with, the credit ratings are not limited, as were the bank examination and loan loss data, to the population of firms borrowing from banks. Dun and Bradstreet ratings are employed primarily in the extension of trade credit. It may therefore be presumed that the firms rated are principally actual or potential users of trade credit, probably a much larger segment of the business population than is able to qualify for commercial bank credit. Indeed, the Dun and Bradstreet population presumably includes some firms that were denied trade credit because of adverse ratings, and thus may not be borrowers at all.[11]

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with a somewhat higher loss rate. An association between heavy lending to small business and above-average loss rates also generally prevailed when the banks were separated into groups whose loan portfolios differed in the proportion of loans to small business, but were similar in other respects.

[10] For a description of these data and some of the results, see *The Study of Economic Growth* (39th Annual Report of the National Bureau of Economic Research), New York, 1959, pp. 60-62. Additional information is contained in a National Bureau memorandum in manuscript form by Victor Zarnowitz, "Credit Ratings of Business Concerns."

[11] There is some evidence, however, that standards governing the extension of trade credit and bank loans are based on similar considerations, even though the stringency of application may differ. When firms were classified according to size and the quality of their financial ratios, changes in the amount of bank credit and trade credit during 1955-57 were found to have followed a generally parallel course. The firms included in the study were the manufacturing and trade firms (largely small and medium in size) for which banks submit financial ratios to the Robert Morris Associates. These results are contained in a forthcoming National Bureau report on risks in lending to small business by Geoffrey H. Moore and Thomas R. Atkinson.

Examiner Criticism Rates

A further source of incomparability of the credit rating and the bank examination data is the national scope of the former contrasted with the regional character of the latter. The most serious difficulty in comparing the two sets of data stems, however, from the different size classifications employed. The Dun and Bradstreet data are classified by net worth, whereas the bank data are grouped by asset size. Furthermore, the Dun and Bradstreet data include many very small firms, while loans to a large proportion of the smallest borrowers would not be evaluated by the bank examiners.

The Dun and Bradstreet data, broken down within industry into two size groups, one of firms with $20,000 or more of net worth and the other of firms with less, are presented in Table 9. For comparison with the criticism rates, the percentages in the table refer to the number of firms in each classification that have low credit ratings. The bank examination data (based on number of firms) for the industries covered by Dun and Bradstreet also have been combined into two sizes. The large and medium groups used earlier in this chapter have been amalgamated to form a single category roughly comparable to the larger Dun and Bradstreet grouping, while the small group has been retained for comparison with the Dun and Bradstreet small firms. This provides fairly comparable data for services, construction, and retail trade, in which the upper limit of "small" business is defined as $50,000 in assets. For manufacturing and wholesale trade, however, the demarcation point between small and medium firms is considerably higher, and comparability for these industries is therefore not as good.

Despite these limitations, the Dun and Bradstreet data support the bank examination data in some (but not all) respects and also yield useful additional information. The Dun and Bradstreet ratings for the larger firms for 1950-58 were examined to ascertain whether the size and industry structure of risks remained relatively constant over time or tended to vary. Within each year, the industries were ranked according to the relative incidence of poor ratings. The correlation among the nine resulting rankings (one for each year) turned out to be significant at the 1 per cent level. This is a particularly impressive result in view of the upward trend in the proportion of low ratings over these years; apparently this uptrend was relatively uniform for all industries.

When the relative incidence of low credit ratings among industry groups is compared with the relative examiner criticism rates of those

TABLE 9

PERCENTAGE OF FIRMS WITH LOW CREDIT RATINGS, BY INDUSTRY AND SIZE OF FIRM, 1950-58

	Manufacturing				*Trade*		
	Total	Durables	Non-durables	Con-struction	Whole-sale	Retail	Services
				LARGE FIRMS			
1950	13.0	18.8	4.2	27.8	6.1	12.8	7.2
1951	8.4	11.6	6.1	10.4	9.6	11.4	7.4
1952	9.5	9.1	10.3	19.1	9.7	14.0	9.4
1953	14.0	16.8	10.9	14.6	12.3	14.0	14.0
1954	11.2	8.3	14.6	12.6	6.8	13.6	10.1
1955	15.7	12.8	13.1	16.4	11.2	14.3	12.3
1956	13.1	14.5	11.6	19.5	13.2	14.2	18.8
1957	15.7	18.6	12.6	23.6	17.5	16.5	14.7
1958	15.9	14.4	16.6	19.8	12.3	19.8	15.6
				SMALL FIRMS			
1950	9.8	0.0	18.4	28.6	19.9	13.7	23.0
1951	6.4	8.3	5.6	15.8	9.1	14.5	20.1
1952	21.1	26.5	17.6	18.5	10.0	17.8	14.3
1953	18.1	23.7	11.4	18.9	17.0	19.6	20.6
1954	20.3	17.7	22.9	16.0	19.3	18.8	19.0
1955	23.9	18.2	31.5	21.5	17.4	20.5	23.4
1956	20.8	30.3	26.2	27.4	21.8	21.6	21.4
1957	36.7	36.0	36.8	23.7	25.4	23.4	28.3
1958	29.3	21.8	39.5	27.8	26.5	26.7	28.9

NOTE: Large firms are those with a net worth of $20,000 or more, small firms those with a net worth under $20,000. Data are averages of monthly figures, as follows: for 1950, July and November; for 1951-52, March, July, and November; for 1953-57, January, March, May, July, September, and November; for 1958, January, March, May, and July. Data for small firms for 1950-52 are not fully comparable with other data because of changes in the rating standards.

The percentages for large firms are somewhat understated, and those for small firms overstated, because of the statistical treatment accorded those cases for which the Dun and Bradstreet books included net worth but gave no credit rating. Where net worth was high, a favorable rating was assumed; where it was low, a low rating was assumed. Listed firms with neither net worth nor credit rating shown were omitted entirely in calculating the percentages.

SOURCE: NBER worksheets in Victor Zarnowitz' MS. study of Dun and Bradstreet credit ratings. "Low" ratings include "fair" and "limited" ratings as defined by Dun and Bradstreet. Other possible ratings are "high" and "good."

same industries, the results are mixed (Table 10). No correlation is found between the relative criticism rates and credit ratings during 1957, the year to which the criticism rates refer. The correlation is barely positive for large firms and negative for small firms. When, however, the average credit ratings of the industries over the entire period 1950-58 are used in place of the 1957 ratings, the relative ranking is quite similar to that developed from the bank examination appraisal for larger firms—the rank correlation between the rankings of the six industries just failing to reach significance at the 5 per cent level.[12]

The industry rankings of the credit ratings of the small firms, on the other hand, were highly erratic from year to year, and were not significantly correlated with each other or with the bank examination data.[13]

Turning now to the difference in credit ratings between large and small firms, we find the incidence of higher ratings to be uniformly greater for the larger firms within each industry. In every year from 1953 through 1958, inspection of Table 9 reveals, no cell representing small firms achieves as small a percentage of low ratings as does even the "worst" of the cells representing larger firms (with one exception—nondurables in 1953).[14] This is generally similar to the bank examination data, although these show a lower incidence of criticism for small firms than for larger firms in durable goods manufacturing and construction. The difference might conceivably reflect again the prevalence of very small firms in the credit ratings population, coupled with the fact that absolute size of net worth as such probably affects the ratings.[15]

[12] Dropping one of the two poorest-conforming industries (construction or services) from the test leads to results that do achieve significance at the 5 per cent level.

[13] A tempting explanation of this phenomenon is to attribute it to the presence of many "very small" firms in the Dun and Bradstreet data, firms whose loans from banks (if any) would have been too small for examination. If this explanation were accepted, it could then be argued further that very small firms, in contrast to merely "small" ones, are more similar in creditworthiness to each other than they are to larger firms in their own industry. However, the data did not permit any further tests of this line of reasoning.

[14] The situation was somewhat different for 1950-52, but this was apparently due to a change in the rating procedure that temporarily improved the ratings of small firms relative to large ones. Zarnowitz, "Credit Ratings of Business Concerns," p. 32.

[15] *Ibid.*, p. 29.

TABLE 10

INCIDENCE OF LOW CREDIT RATINGS AND OF EXAMINER CRITICISM, BY INDUSTRY AND SIZE OF FIRM

	INCIDENCE (PER CENT)			RANK BASED ON		
	Low Credit Ratings		Examiner Criticism	*Credit Ratings*[a]		Examiner Criticism
	1950-58 Average	1957	1957	1950-58 Average	1957	1957
			A. LARGER FIRMS[b]			
Wholesale trade	12.3	17.5	0.91	1	4	1
Nondurable goods manufacturing	12.5	12.6	1.30	2	1	2
Services	13.7	14.7	3.58	3	2	5
Durable goods manufacturing	15.6	18.6	2.60	4	5	3
Retail trade	16.3	16.5	7.36	5	3	6
Construction	20.5	23.6	2.68	6	6	4
			B. SMALL FIRMS[b]			
Wholesale trade	20.8	25.4	3.72	1	3	4
Nondurable goods manufacturing	26.2	36.8	1.79	5	6	2
Services	24.9	28.3	8.33	6	4	6
Durable goods manufacturing	22.8	36.0	2.50	3	5	3
Retail trade	22.1	23.4	7.69	2	1	5
Construction	24.8	23.7	0[c]	4	2	1[c]

NOTE: All percentages based on numbers of firms.

SOURCE: Calculated from Tables 4 and 9.

[a] Average of the nine annual ranks, which may differ from ranks based on averages of the actual data; the former, given in the table, is the "best" estimate of the "true" ranking. The nine sets of rankings based on the credit ratings data (one set for each year) were significantly correlated for larger firms, but not for small firms.

[b] Credit ratings: Larger firms are those with net worth of $20,000 or over; small firms, those with net worth of less than $20,000. Examiner criticism: Data for larger firms are amalgamated figures for "large" and "medium" firms in Table 4. Data for small firms are identical to data for small firms in Table 4.

[c] Estimated number of all loans in cell less than 100.

Examiner Criticism Rates

Closer inspection of the basic credit ratings data, moreover, reveals a further parallel with the bank examination results. The results in Table 9 are averages of data for several months within each year. For the period 1950-58 there were forty-two such monthly observations. If we consider now these individual observations, it develops that in all industries the percentage of high credit ratings among small firms occasionally did exceed that for large firms. In fact, small firms showed up better than large firms on three occasions in retail trade, six times in services, and eight times in wholesale trade. In durable and nondurable goods manufacturing, however, this occurred eleven times, and it happened sixteen times in construction.[16] The credit ratings data thus lend some support to the indications from the bank examination material that small firms in construction and manufacturing may be better credit risks compared to large firms in these industries than small firms in trade and services are compared to their larger counterparts in the same industries.

We have been investigating whether there exists a stable, generally valid relationship among the varying degrees of risk associated with bank lending to business borrowers of differing industry and size. However, lending risks may be affected by the amplitude of the cyclical swings to which the fortunes of the borrowers may be subject, as well as by their current credit standing. Even if all of a bank's customers have superior credit ratings now, that bank may still be incurring above-normal risks if these borrowers happen to be concentrated in lines of business that are particularly vulnerable to cyclical adversity. It might be argued, in fact, that this risk, because he may not fully recognize it, may be more dangerous to the lender than if he were extending loans to known poor credit risks. In the latter case the lender might be more likely to take protective measures by charging higher rates, establishing fuller reserves, requiring collateral, and supervising the loan more closely.

These considerations are of less relevance to the quality of bank loans than they might be to other types of credit. The bank examination and credit ratings data already cited indicate the "structural" pattern of risks among differing industry and size groups to be fairly stable over time. This suggests that perhaps the "cyclical" ordering of lending risks may not depart very much from the "structural"

[16] *Ibid.*, p. 19.

one.[17] Furthermore, a substantial part of bank loans is short-term and not likely to experience a great deal of cyclical diversity during its lifespan. Still, many bank loans do extend, contractually or by routine renewal, for terms longer than one year. The question of cyclical risks therefore remains relevant, though perhaps subsidiary. The bank examination data obtained in this survey, however, are insufficient for further analysis of the problem.

Conclusion

The foregoing results, of course, fall short of a comprehensive or conclusive validation of examiner criticism rates as indicators of gradations in quality among borrowers of different industries and sizes. Nevertheless, the tentative conclusion seems justified that a definite and fairly stable ordering of the risks that banks incur in lending to firms in the various industry and size groups does exist, and that the pattern of the examiner criticism rates represents at least an approximate measure of the pattern of this ordering. Provided the differences in lending risks associated with firms of various sizes and industries remain at all stable over time, it follows that shifts in the composition of business borrowers between firms of different industries and sizes can have a pronounced effect on the total risk associated with a given volume of lending. Other things equal, for example, a rise in lending to medium and small retail firms, with their substantially above-average risk, could appreciably increase the riskiness of the aggregate portfolio. (It is assumed, of course, that the additional loans are roughly comparable in "quality" to those already on the books.) A further implication of our data is that caution needs to be exercised in generalizing about the quality of loans to borrowers in particular industries without regard to size of firm, and about the quality of loans to firms of various sizes without regard to their industry.

[17] Stability of rankings from year to year during the period after World War II was found also in the incidence of business failures, liabilities of failures, and business discontinuances among industries (without respect to size of firm).