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Criticism Rates as Indicators of Credit Quality, 1947-57

Our analysis, which so far has dealt largely with the structural and quality characteristics of borrowers, now shifts to the aggregate of criticized loans, and to the fluctuations in this aggregate and its major components over the eleven years (1947-57) covered by our series.

Most of the data used here come from the summary reports that the examiners prepare following every examination. These reports, which show the total dollar volume of criticized loans for each bank, were tabulated for fifty-nine of the sixty banks in the original sample. (One bank had to be omitted because of an unresolvable data problem caused by a merger.) The main emphasis is on the criticized loans classified as "substandard": this designation most closely approximates a predictive measure of low loan quality. Loans classified as "doubtful" and "loss," by contrast, represent loans on which sizable losses are considered certain and on which delinquency presumably has already occurred; the designations "doubtful" and "loss" are thus primarily after-the-fact recordings.

Several different summary measures of criticized loans were employed. They included (1) simple dollar aggregates; (2) the over-all percentage of loans criticized, obtained by dividing the total of all criticized (or substandard) loans by the aggregate of all loans; and (3) the average percentage of loans criticized "per bank," obtained by calculating criticism rates for each bank individually and averaging them. The first two measures, of course, give most weight to the larger banks with high loan totals and were, in fact, dominated by the results for the largest banks, primarily the giant New York City banks. The average "per bank" ratios, on the other hand, were subject to distortion

by the extreme criticism rates found for some small banks. Annual frequency distributions of banks according to the level of criticism rates (i.e., how many banks had no criticized loans, how many had less than 1 per cent of loans criticized) were also constructed. All of the ratio measures involving criticized loans, moreover, were calculated in two forms: (1) as ratios to *total* loans, and (2) as ratios to *business* loans. The second form was suggested by the earlier finding that most of the criticized loans were business loans.

Amount and Distribution of Criticized Loans

Substandard loans comprise the bulk of all criticized loans and dominate the fluctuations in the total (see Table 11 and Chart 1). The volume of "doubtful" loans was minuscule.[1] The volume of loans classified as "loss," though larger, fluctuated widely and with no apparent relation to the general business cycle.

The total amount of substandard loans at the fifty-nine banks that were studied ranged, during the eleven years from 1947 through 1957, from a low of $18 million in 1951 to a high of $49 million in 1955. Large banks (defined here and throughout as banks with deposits of $100 million or over) accounted for most of the total in all years: for $14 out of $18 million in 1951, for example, and for $42 out of $49 million in 1955. And of these amounts, the large banks in the New York District contributed impressive shares: $12 million in 1951 and $35 million in 1955. For all New York banks, small and large, taken together, the low for substandard loans was $16 million in 1951, the high $39 million in 1955. By contrast, total substandard loans for the twenty Atlanta banks ranged from a low of less than $1 million to a high of $9 million. From these figures it is readily apparent that all results based on loan aggregates are heavily weighted by the large New York banks.

When the volume of substandard loans is expressed as a percentage of total loans, the results range from a low of 0.55 per cent in 1951 to a high of 1.87 per cent in 1948 (Table 12 and Chart 2). Expressed as a proportion of only business rather than total loans, these rates are of course higher: 0.82 and 2.81 per cent, respectively. Over

[1] It is interesting to note, however, that the behavior of the "doubtful" category corresponded rather closely to that of the volume of losses on loans at all insured commercial banks.

TABLE 11

CRITICIZED LOANS AND COMPONENTS, 1947-57

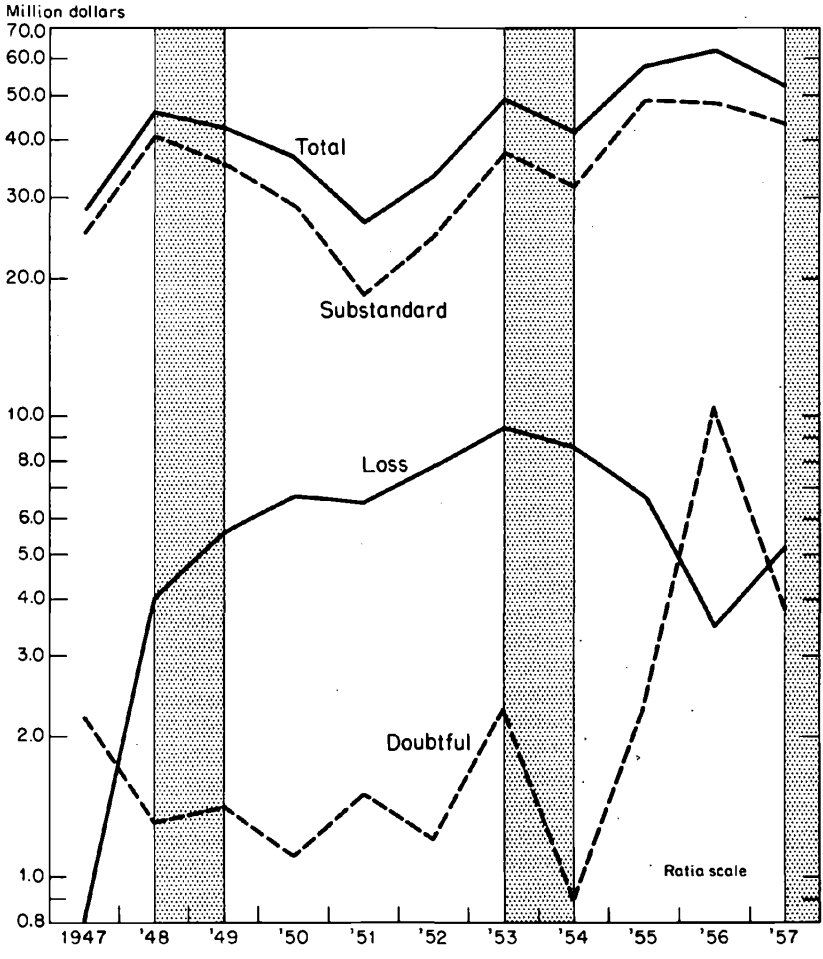
	Criticism Class					
	Total	Sub-standard	Doubtful	Loss	Business Loans	Total Loans
			MILLION DOLLARS			
1947	28.1	25.1	2.2	0.8	1,385.3	1,960.2
1948	46.0	40.7	1.3	4.0	1,453.6	2,160.4
1949	42.4	35.4	1.4	5.6	1,291.7	2,152.0
1950	36.7	28.8	1.1	6.7	1,618.0	2,762.1
1951	26.3	18.2	1.5	6.5	2,211.0	3,334.5
1952	33.4	24.4	1.2	7.8	2,337.4	3,570.6
1953	48.9	37.1	2.3	9.5	2,372.7	4,112.6
1954	41.2	31.7	0.9	8.6	2,176.2	4,062.0
1955	57.6	48.6	2.3	6.7	2,688.3	4,888.9
1956	62.3	48.2	10.5	3.5	3,161.2	5,371.4
1957	52.3	43.2	3.8	5.2	3,264.9	5,537.3
			PERCENTAGE OF CRITICIZED LOANS			
1947	100	89	8	3		
1948	100	88	3	9		
1949	100	84	3	13		
1950	100	79	3	18		
1951	100	69	6	25		
1952	100	73	4	23		
1953	100	76	5	19		
1954	100	77	2	21		
1955	100	84	4	12		
1956	100	77	17	6		
1957	100	83	7	10		

NOTE: Data not available for all fifty-nine banks in all years.
SOURCE: Bank Examination Survey.

time, however, the two sets of rates follow a largely parallel course. As noted, these results reflect primarily the record of the New York banks, particularly in the early years of the period when interdistrict differences were large. Such differences narrowed considerably after 1950. Small banks had higher criticism rates than large banks in all years, but this result was influenced by the lower examiner cut-off points used at small banks. At small banks, more of the riskier loans to small businesses would be evaluated.

CHART 1

Criticized Loans and Components, 1947-57



NOTE: Shaded areas represent reference cycle contractions according to National Bureau annual chronology.

SOURCE: Table 11.

TABLE 12

SUBSTANDARD LOANS AS A PERCENTAGE OF TOTAL AND OF BUSINESS LOANS, BY SIZE OF BANK AND BY DISTRICT, 1947-57

	All Banks	Large Banks[a]	Small Banks[a]	New York	Phila-delphia	Atlanta
			A. PERCENTAGE OF TOTAL LOANS			
1947	1.27	1.22	1.94	1.50	0.24	2.66
1948	1.87	1.77	3.34	2.33	0.18	0.52
1949	1.63	1.56	2.51	2.01	0.28	0.67
1950	1.04	1.01	1.43	1.24	0.40	0.39
1951	0.55	0.45	1.61	0.64	0.24	0.54
1952	0.73	0.68	1.23	0.83	0.32	0.44
1953	0.93	0.89	1.38	1.12	0.39	0.78
1954	0.87	0.81	1.42	0.91	0.69	0.98
1955	1.06	1.02	1.42	1.15	0.74	1.08
1956	0.90	0.88	1.13	1.05	0.53	0.77
1957	0.78	0.71	1.54	0.81	0.64	1.10
			B. PERCENTAGE OF BUSINESS LOANS			
1947	1.71	1.61		1.96	0.36	3.55
1948	2.81	2.74		3.19	0.29	1.31
1949	2.62	2.43		3.11	0.51	1.64
1950	1.73	1.62		1.89	0.72	1.38
1951	0.82	0.66		0.88	0.46	1.49
1952	1.09	0.99		1.16	0.66	0.97
1953	1.60	1.47		1.73	0.91	2.19
1954	1.60	1.42		1.52	1.84	2.65
1955	1.93	1.80		1.85	2.14	2.89
1956	1.53	1.44		1.57	1.28	1.90
1957	1.33	1.15		1.24	1.40	2.87
Banks in sample	59	13	46	19	20	20

NOTE: Percentages are calculated from the loan aggregate for each class of banks. In each year, only those banks for which *both* substandard and total (or business) loans were available are included. See the first column of panel A, Table 14, for the number of banks actually reflected in panel A above. See the first column of panel B in Table 14 for the number of banks reflected in panel B above.

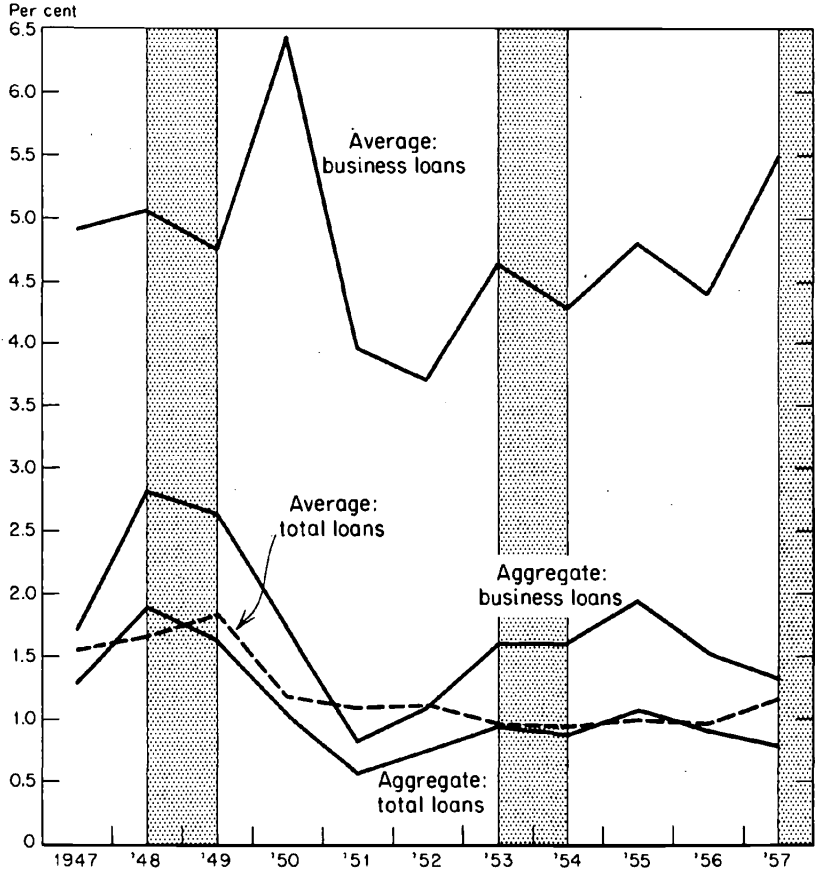
For small banks, the criticism rates based on business loans are not shown, because some of these banks have significant amounts of criticized nonbusiness loans.

SOURCE: Bank Examination Survey.

[a] Large banks are those with deposits of $100 million and over, small banks those with deposits under $100 million.

CHART 2

Examiner Criticism Rates: Various Concepts



NOTE: Shaded areas represent reference cycle contractions according to National Bureau annual chronology.

SOURCE: Tables 12 and 13.

The predominance of the New York banks is minimized by considering the banks individually and averaging the criticism rates thus obtained. Since small banks are more numerous and generally have higher criticism rates than large banks, this procedure produces a somewhat higher criticism rate relative to total loans in most years. The effect on the ratio of substandard to business loans is considerably more pronounced: as opposed to the range of 0.82 to 2.81 per cent obtained previously, the range when each bank is given the same weight is from 3.72 to 6.44 per cent (Table 13). These markedly higher rates reflect the disproportionate influence of a few small (probably rural) banks with very little in the way of business loans in their loan port-

TABLE 13

AVERAGE RATIOS OF SUBSTANDARD TO TOTAL AND TO BUSINESS LOANS, BY SIZE OF BANK, 1947-57

(per cent)

	A. Ratio to Total Loans			*B. Ratio to Business Loans*[a]		
	All Banks	Large Banks[b]	Small Banks[b]	All Banks	Large Banks[b]	Small Banks[b]
1947	1.55	1.11	1.72	4.90	2.00	
1948	1.65	1.15	1.83	5.06	1.86	
1949	1.81	1.07	2.07	4.76	2.23	
1950	1.16	0.79	1.26	6.44	1.44	
1951	1.07	0.51	1.24	3.95	1.25	
1952	1.10	0.67	1.20	3.72	1.51	
1953	0.95	0.67	1.03	4.62	1.40	
1954	0.93	0.87	0.95	4.27	2.75	
1955	0.98	0.80	1.02	4.80	2.76	
1956	0.95	0.74	1.02	4.40	2.65	
1957	1.15	0.65	1.29	5.49	1.33	

NOTE: Percentages were calculated by averaging results for individual banks. Ratio to business loans for small banks is not shown, because some banks have significant amounts of criticized nonbusiness loans.

SOURCE: Bank Examination Survey.

[a] Banks with ratios over 100 per cent excluded.

[b] Large banks are those with deposits of $100 million and over, small banks those with deposits of under $100 million.

folios. Their ratios of criticized loans (perhaps largely farm loans) to business loans are therefore very high, in a few instances exceeding 100 per cent.

In general, between one-fifth and one-third of the banks had no substandard loans at all (Table 14). Most of these banks are of course small; large banks with many loans are likely to have at least a few that are criticized. Close to half of the banks experienced substandard rates higher than zero, but less than 1 per cent of *total* loans; most of the

TABLE 14

DISTRIBUTION OF BANKS ACCORDING TO CRITICIZED LOAN RATIOS, 1947-57

	Number of Banks	Percentage Distribution					
		0	0.001-0.999	1-4.999	5-9.999	10-19.999	20 and over
		A. SUBSTANDARD LOANS TO TOTAL LOANS					
1947	43	23	37	30	7	2	0
1948	45	31	24	36	7	2	0
1949	46	28	30	30	7	4	0
1950	57	25	42	28	5	0	0
1951	56	30	45	18	7	0	0
1952	55	29	40	24	5	2	0
1953	58	21	43	36	0	0	0
1954	58	19	52	28	2	0	0
1955	58	22	47	28	3	0	0
1956	59	20	42	36	2	0	0
1957	58	24	40	34	2	0	0
		B. SUBSTANDARD LOANS TO BUSINESS LOANS					
1947	51	22	29	22	8	16	4
1948	54	28	22	17	19	7	7
1949	55	29	11	33	15	2	11
1950	55	24	16	33	9	9	9
1951	56	30	16	29	12	7	5
1952	54	28	26	22	13	7	4
1953	57	21	25	26	16	9	4
1954	56	20	23	30	11	11	5
1955	58	22	12	38	16	9	3
1956	59	20	22	29	17	7	5
1957	58	24	14	31	14	9	9

SOURCE: Bank Examination Survey.

large banks are generally to be found in this group. Together, banks with no substandard loans at all, and those with a substandard rate of less than 1 per cent, ranged from 55 to 75 per cent of all banks. The bulk of the remaining banks had substandard rates of less than 5 per cent of total loans, but in most years, especially earlier in the period, four or five did incur criticism rates in excess of 5 per cent. Rarely, however, did the rate exceed 10 per cent of total loans, and never 20 per cent. The number of banks with high criticism rates declined appreciably during 1947-57.

When the volume of substandard loans is related to business loans, the typical rates are of course higher. In most years, the largest number of banks fell in the 1-5 per cent range, while some banks had rates exceeding 10 and even 20 per cent. As pointed out previously, however, these high rates occurred mainly at small banks with very few business loans; it seems likely, therefore, that the loans criticized at these banks were in fact largely nonbusiness loans.

Examiner Criticism Rates as Measures of Fluctuations in Aggregate Loan Quality

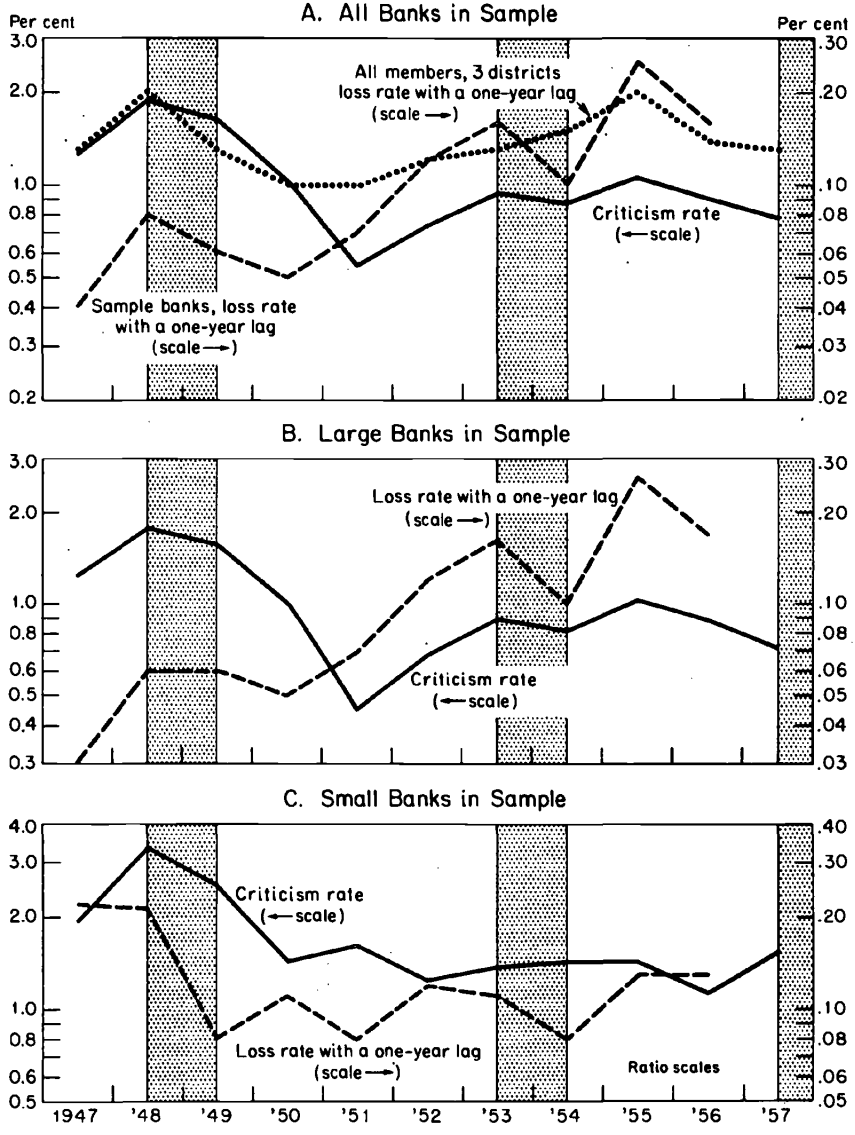
Having sketched the major features of this group of banks from the viewpoint of examiner criticism, it is once again appropriate to inquire into the validity of criticism rates as measures of loan quality. It was shown in Chapter 2 that, taking the eleven years covered by the survey as a whole, there was a significant though low correlation between criticism and loss rates on a bank-by-bank basis—and it was explained why this particular juxtaposition was in many ways an "unfair" test of examiner efficiency. In Chapter 3, the industry and size differentials in criticism rates were found to correspond approximately to those in other measures of credit quality.

These earlier results showed essentially the adeptness of the examiners at picking out potentially troublesome loans from all those examined on a given date. We now focus on the validity of *changes* in criticism rates as indicators of changes in loan quality.

Changes in the criticism rate for a given group of banks might perhaps be expected to anticipate fluctuations in loss rates. The year-to-year changes in the aggregate criticism and loss rates for these banks

CHART 3

Criticism and Gross Loss Rates, 1947-57



NOTE AND SOURCE TO CHART 3

NOTE: Criticism rates refer to year indicated, loss rates to the following year. Criticism rates are ratios of substandard to total loans; gross loss rates, ratios of charge-offs to total loans. All ratios are calculated from loan aggregates. Large banks are those with deposits of $100 million or over. Shaded areas represent reference cycle contractions according to National Bureau annual chronology.

SOURCE: Tables 12 and 15.

(as well as for all member banks in these three districts) were in fact fairly parallel, with the criticism rate tending to lead (Chart 3). The lead largely reflected the pattern of criticism and loss rates at the larger banks. The direction of year-to-year changes in the criticism and loss rates for large banks corresponded in six of ten years when same-year figures were compared, but this was increased to nine out of ten cases when criticism rates for each year were compared with loss rates for the following year. At small banks, where the amplitude of the swings in both rates was much narrower, the year-to-year changes in the two series corresponded in less than half the years, whether or not same-year figures were used. On the other hand, the general trend in loss rates at large banks in the sample was upward over 1947-56, while the trend in their criticism rates was downward. The trends in the loss and criticism rates of small banks in the sample were more nearly alike.

There were persistent differences in the level of criticism rates among Federal Reserve Districts, and among banks of different sizes, that were not accompanied by parallel differences in loss rates. Thus, although the proportion of substandard to total loans was highest in the New York District, loss rates in New York were generally as low as or lower than loss rates in the Atlanta and Philadelphia Districts (see Table 15). A striking divergence also appears when criticism and loss rates for large and small banks are contrasted. By whatever measure is used, the criticism rate is higher for small banks than for large banks in every year. Yet the differences in loss rates between these two classes of banks in most years are small—and from 1953 or 1954 on (depending on the measure used), the small banks in our sample had lower loss rates than the large banks.[2]

[2]In aggregate data, large banks almost invariably show lower loss rates than small banks. The departure from the norm in the present case is attributable partly to sizable underrepresentation of very small banks in the sample. But this can be only a partial explanation. Data for all member banks show that even the larger

TABLE 15

GROSS LOSS RATES ON TOTAL LOANS, BY SIZE OF BANK AND BY FEDERAL RESERVE DISTRICT, 1947-58

(percentage of total loans)

	All Banks	Large Banks[a]	Small Banks[a]	New York	Philadelphia	Atlanta	All Member Banks, Three Districts
			A. BASED ON LOSS AND LOAN AGGREGATES[b]				
1947	0.23	0.22	0.38	0.28	0.02	0.05	n.a.
1948	0.04	0.03	0.22	0.04	0.07	0.05	0.13
1949	0.08	0.06	0.21	0.08	0.06	0.09	0.20
1950	0.06	0.06	0.08	0.05	0.11	0.05	0.13
1951	0.05	0.05	0.11	0.05	0.06	0.06	0.10
1952	0.07	0.07	0.08	0.05	0.11	0.11	0.10
1953	0.12	0.12	0.12	0.11	0.11	0.28	0.12
1954	0.16	0.16	0.11	0.16	0.15	0.14	0.13
1955	0.10	0.10	0.08	0.05	0.22	0.12	0.15
1956	0.25	0.26	0.13	0.27	0.20	0.16	0.20
1957	0.16	0.17	0.13	0.16	0.15	0.26	0.14
1958	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0.13
			B. AVERAGE LOSS RATE "PER BANK"				
1947	0.24	0.27	0.23				
1948	0.28	0.06	0.36				
1949	0.31	0.09	0.38				
1950	0.10	0.08	0.11				
1951	0.10	0.06	0.11				
1952	0.12	0.07	0.13				
1953	0.14	0.15	0.14				
1954	0.15	0.25	0.12				
1955	0.08	0.15	0.07				
1956	0.14	0.18	0.13				
1957	0.14	0.14	0.13				
Banks in sample	59	13	46	19	20	20	

SOURCE: Bank Examination Survey and *Federal Reserve Bulletin*.

[a] Large banks are those with deposits of $100 million or over, small banks those with deposits under $100 million.

[b] In each year, only those banks for which both loss and loan data are available are included.

The aggregate criticism rate for the sample banks also conformed well with some but not all of various global measures of credit quality (see Table 16 and Chart 4). The incidence of high and low Dun and Bradstreet credit ratings, for example, is also a predictive measure of credit quality, albeit for a different universe of borrowers and lenders. The upper panel of Chart 4 compares annual data for the examiner criticism rate with the incidence of low ratings for large firms in the Dun and Bradstreet universe, the latter adjusted for the differences in the distribution of firms among industries between the Dun and Bradstreet and Bank Examination Survey populations.[3] During the seven years covered by this comparison, the year-to-year movements of this series and of the criticism rate were in the same direction and roughly similar in magnitude from 1950 to 1955, but diverged in 1956 and 1957.

When the fluctuations in criticism rates are matched against after-the-fact indicators of quality, such as business discontinuance and failure rates, the criticism rate appears to have a one-year lead during most of the period covered (see the lower panel of Chart 4). The direction of the year-to-year change in the Dun and Bradstreet business failure rate corresponds to that in the criticism rate in the preceding year in eight out of ten years. The exceptions are that the declines in criticism rates in 1956 and 1957 were followed by increases rather than decreases in the failure rate in 1957 and 1958. A similar comparison

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banks in the "under $100 million" deposit class have appreciably higher gross loss rates than banks whose deposits exceed $100 million; net loss data for Federal Reserve member banks in the three districts from which the present sample is drawn show a similar relationship. Apparently, small banks are not only underrepresented in the sample, but even those selected have atypical loss rates.

The year-to-year movements in the aggregate loss rate for the sample banks correspond closely with those of all member banks in the three Federal Reserve Districts involved, except for 1955, when the sample loss rate dipped sharply while that for all member banks rose. For the period as a whole, the sample loss rate shows a clear uptrend relative to the stable all-member loss rate, but this probably reflects the underrepresentation of the smaller banks. Loss rates of large banks were rising relative to those for small banks during the mid-1950's.

[3]This was necessary because of the sizable differences in the industrial composition of the two populations. The Dun and Bradstreet data in the chart are a weighted average of the incidence rates for the various industries, the 1957 industry distribution (by number of firms) of the bank examination firms serving as the weights. The Dun and Bradstreet data for large firms were used because very small loans are not evaluated by the examiners; see above, Chapter 3, pp. 32-33.

TABLE 16

VARIOUS INDICATORS OF CREDIT QUALITY AND BUSINESS MORTALITY, 1947-58

	Incidence of			
	Examiner Criticism[a]	Low Credit Ratings[b]	Business Failures[c]	Business Discontinuances[d]
1947	1.27	n.a.	9.5	6.55
1948	1.87	n.a.	13.6	7.28
1949	1.63	n.a.	23.2	7.69
1950	1.04	12.7	22.9	7.22
1951	0.55	9.7	19.8	6.79
1952	0.73	12.2	18.5	6.70
1953	0.93	13.8	21.2	7.15
1954	0.87	11.4	26.1	7.52
1955	1.06	13.5	25.6	7.32
1956	0.90	15.2	29.0	7.80
1957	0.78	17.1	30.7	7.64
1958	n.a.	16.9	32.6	7.86

[a] Ratio (in per cent) of total substandard to total loans (Table 12).

[b] Percentage of firms with net worth of $20,000 and over rated "fair" or "poor" by Dun and Bradstreet (weighted average of data in Table 9; see footnote c).

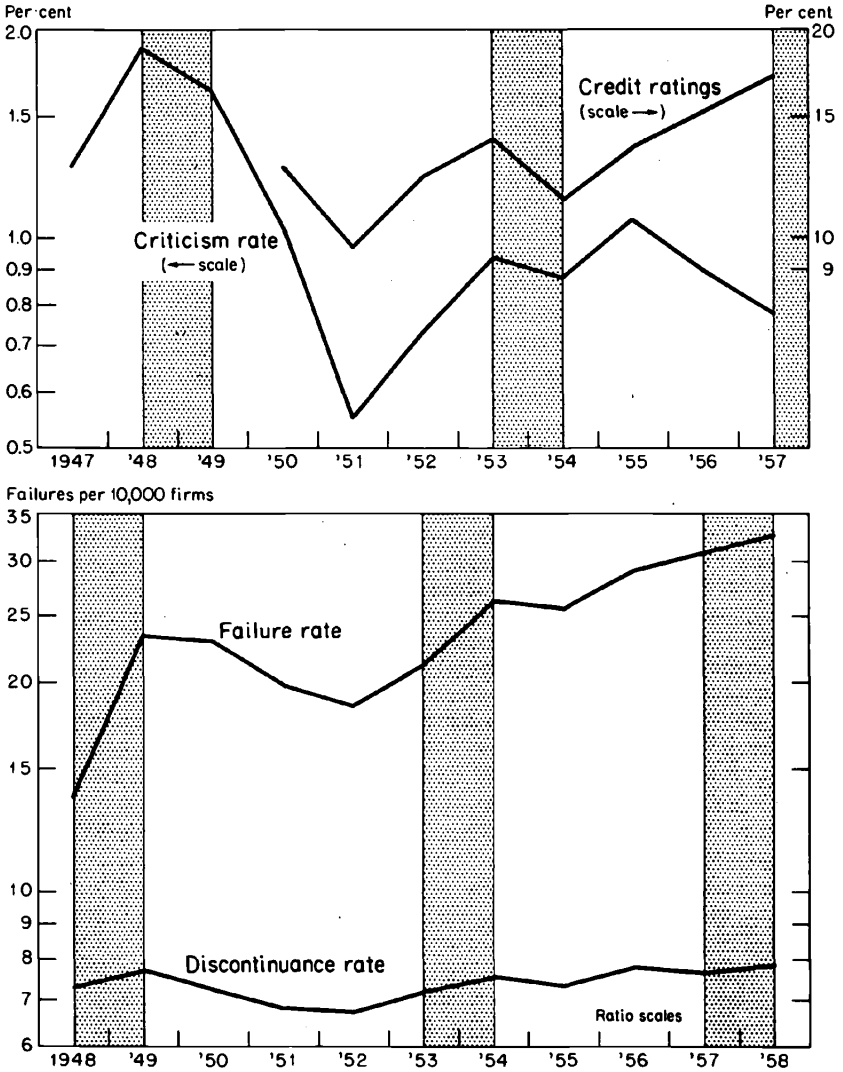
[c] Number of failures per 10,000 firms in the total business population calculated from Dun and Bradstreet failure statistics and Department of Commerce business population estimates. The former may be found in February issues of *Dun's Review* (1945-51), *Dun's Statistical Review* (1952-54), and *Dun's Review and Modern Industry* (1954-58). The latter appeared in the *Survey of Current Business*, May 1959, p. 18, and January 1954, p. 15. This calculated failure rate differs from the rate as defined in Dun and Bradstreet publications. In these, failures are expressed as a proportion of all firms listed in the Dun and Bradstreet reference books.

[d] Discontinuances as a percentage of the total business population at the beginning of each year. *Survey of Current Business*, January 1954, pp. 15-16; May 1959, pp. 18-19.

of changes in the discontinuance rates with those in the criticism rates of the preceding year shows a correspondence for nine out of ten years; the exception, continuing the pattern, is the decline in the criticism rate in 1957 followed by the increase in discontinuances in 1958. In both these cases, a comparison of the actual series without introducing one-year lags would show a correspondence in the direction of change in only

CHART 4

Criticism Rates and Other Indicators of Credit Quality, 1947-58



NOTE: Time scale in lower panel lags one year behind that in upper panel. Shaded areas represent reference cycle contractions according to National Bureau annual chronology.

SOURCE: For description of data and sources, see Table 16.

half the years or fewer. Thus, except in 1956 and 1957, the direction of change in the proportion of loans classified substandard was a fairly reliable predictor of the direction of change in business mortality rates. On the other hand, it was not a good indicator of trend. As the chart shows, the criticism rate was substantially lower in the 1950's than in 1947-49, while the trend of the other indicators was level or upward.

Fluctuations in the criticism rate showed no relation to movements in the financial ratios of all manufacturing corporations (Chart 5), even though financial ratios are apparently important in the examiners' appraisal of individual loans.[4] However, differences in the populations that the two sets of data represent may partly explain the divergence. As part of the Bank Examination Survey of individual loans outstanding in 1957, financial ratio data for 1953-57 were obtained for the 1957 borrowers that had been on the books in these earlier years.[5] On the average, the ratios showed little change in 1954, declined significantly in 1955, improved in 1956, and deteriorated once more in 1957. For 1954-56, this accords with the movement of criticism rates. But for 1957, as is the case for all the indicators that have been considered, the measures diverge.

The "inconsistency" of the change in criticism rates from 1956 to 1957 compared with that shown by the other indicators may be explained in several ways. The 1957 decline in the criticism rate based on aggregate loans of the sample banks was entirely attributable to a drop in substandard loans at one large bank; the criticism rate for 1957 calculated on a per bank basis (Table 13) does, in fact, show a rise from 1956. Perhaps a larger sample would have yielded a rise in the aggregate rate also.

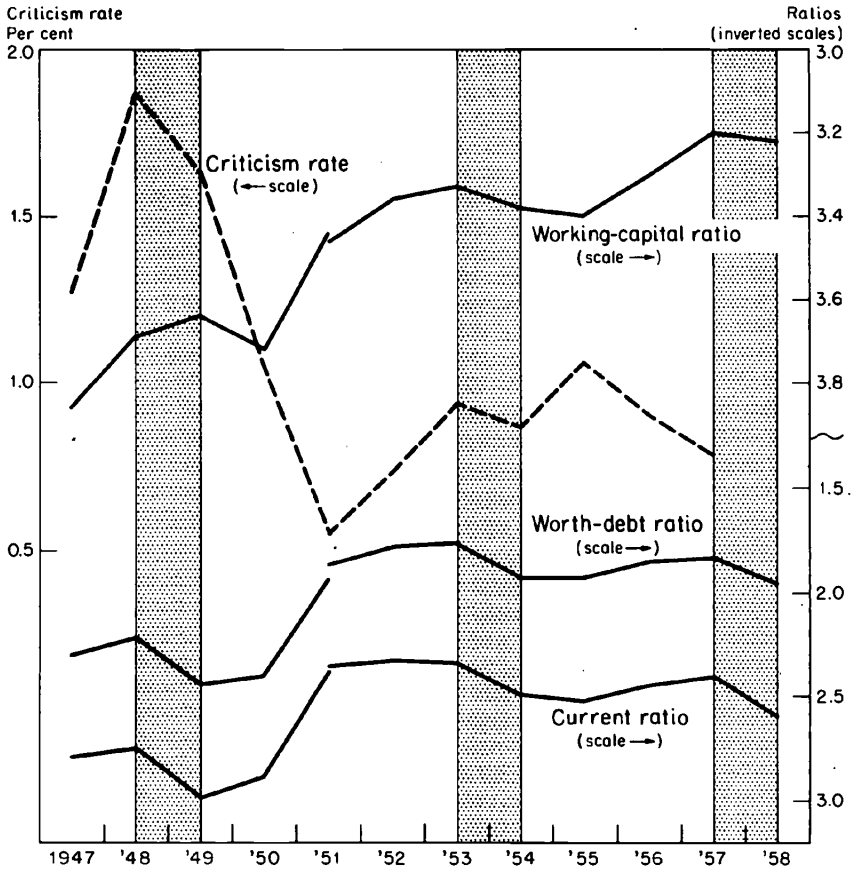
There exists, however, an alternative explanation. Average financial ratios of borrowers with criticized loans were found to be significantly lower in 1956 and particularly in 1957 than in previous years.

[4] Indeed, it would be impossible for any series to conform to all the various existing indicators of credit quality (such as financial ratios, business mortality rates, and credit ratings), since these indicators do not conform among themselves.

[5] For various reasons, the aggregates of these figures are not statistically reliable, and their meaningfulness would be open to question in any event. The data met certain tests, however, that permitted the direction of change of the ratios to be analyzed. See my unpublished Ph.D. dissertation, "Changes in the Quality of Business Loans of Commercial Banks," Columbia University, December 1960, pp. 97-103 and 180-189.

CHART 5

Examiner Criticism Rates and Financial Ratios of Manufacturing Corporations, 1947-58



NOTE: Ratio data are averages of quarterly figures. Shaded areas refer to reference cycle contractions according to National Bureau annual chronology.

SOURCE: Criticism rates—Bank Examination Survey. Financial ratios—Securities and Exchange Commission and Federal Trade Commission, *Quarterly Reports for Manufacturing Corporations.*

In these years, in other words, financial ratios which formerly drew criticism were now escaping it; hence examiner standards for financial ratios may have been falling. It is conceivable, therefore, that the drop in the aggregate criticism rate in 1956 and 1957 may reflect some overall lowering of examiner standards in those years.[6] Financial ratios, however, are only one of many criteria of quality used by the examiners. As the preceding discussion shows, the cyclical patterns of the various dimensions of quality for which data exist differ substantially. Thus it is quite possible that, viewed as a whole, examiner standards remained unchanged.

A Quarterly Index of Criticism Rates

In order to investigate the timing relation between movements of criticism rates and the general business cycle, the examination data were cast into quarterly form. Although each bank was examined only once a year, examinations were, of course, conducted the year round, so that a quarterly time series can, in principle, be constructed simply by considering the results for those banks examined in any particular quarter. Unfortunately, the process of splitting the fifty-nine bank sample into four groups each year did not leave enough banks in the groups to establish any meaningful pattern. Both the levels of the results and the quarter-to-quarter changes were affected by extreme values for a few banks.

Had most banks always been examined in the same quarter—say, always in the first quarter of the year—meaningful year-to-year comparisons on a quarterly basis might perhaps have been feasible. However, surprise is an element in the examination process; in fact, in this particular sample of banks, only from one-fourth to one-half of the banks were examined in the same quarter in successive years, and the particular banks involved from year to year changed, of course, all the time. Consequently, this avenue of exploration of the quarterly data also was closed.

A more fruitful effort to make use of intrayear data involved a "diffusion" approach: in each quarter, the number of banks showing increases or decreases, respectively, in the ratio of substandard to business loans, compared with their previous examination, was counted (see Table 17). This process, in effect, gives equal weight to every bank, regardless of its size, the level of its criticism rate, and the magnitude of

[6]For the detailed analysis, see *ibid.*, pp. 233-238.

TABLE 17

PERCENTAGE OF BANKS WITH LOWER PROPORTION OF SUBSTANDARD TO BUSINESS LOANS (HIGHER LOAN QUALITY) THAN AT PREVIOUS EXAMINATION, BY YEARS AND BY QUARTERS, 1948-57

	Quarter				Full Year
	I	II	III	IV	
1948	61[a]	75[a]	45	38	49
1949	45	41	53	47	49
1950	46	60	41	62	52
1951	46	50	62	68	61
1952	69[a]	50	58	50	54
1953	22[a]	44	43	33	38
1954	50	62	52	17[a]	48
1955	58	64	31[a]	64	57
1956	75	50	61[a]	48	57
1957	29	43	50	57	46
	FOUR-QUARTER CENTERED MOVING AVERAGE				
1948	—	—	53	46	
1949	43	45	47	49	
1950	50	50	52	51	
1951	52	56	59	62	
1952	62	59	51	44	
1953	42	38	39	45	
1954	48	47	46	48	
1955	45	48	56	57	
1956	59	60	53	46	
1957	44	44	—	—	

NOTE: Banks showing no change between successive examinations in the proportion of substandard loans were counted as one-half.

SOURCE: Bank Examination Survey.

[a] Based on fewer than ten banks.

any changes. Since the unit of observation is the direction of change in a bank's criticism rate, the series is, in fact, an index of the rate of change, rather than of the level of criticism rates.[7]

[7] The results when the ratio of substandard to total loans was used were generally similar but less clear-cut, partly because the information for calculating these ratios was missing in a much larger number of cases.

The fact that four to seven quarters may intervene between successive examinations of a given bank means that the change in quality recorded at the time of the examination might have occurred (or started to occur) much earlier. Accordingly, it might have been appropriate to "center" the diffusion index at approximately the midpoint of this interval, say, two or three quarters prior to the examination date.[8] This has in fact been done in Chart 6, in which the data have been plotted two quarters earlier than shown in Table 17, so that they may be appropriately compared with the reference cycle.

The results (the dark line in Chart 6) are of course rather erratic since in each quarter so few banks are involved. In seven of the forty-calendar quarters covered by the series, there are fewer than ten banks in the sample. Nevertheless, the series shows a distinct cyclical pattern.

Troughs in the quarterly series are marked in the second quarter of 1948, the third quarter of 1952, and the third quarter of 1956. It must be noted that two other particularly low points were omitted: the second quarter of 1954 and the first quarter of 1955. These lows appear to result from erratic movements within a cyclical phase and were instances in which the sample included less than ten banks. Peaks in the series are placed in the third quarter of 1951 and the third quarter of 1955. A peak may also have occurred in the fourth quarter of 1947 (or earlier). The index thus moves up during business cycle contractions, reaching its peak rather early in the expansions. After attaining its peak, it declines sharply, falling to its low point well before the onset of recession.

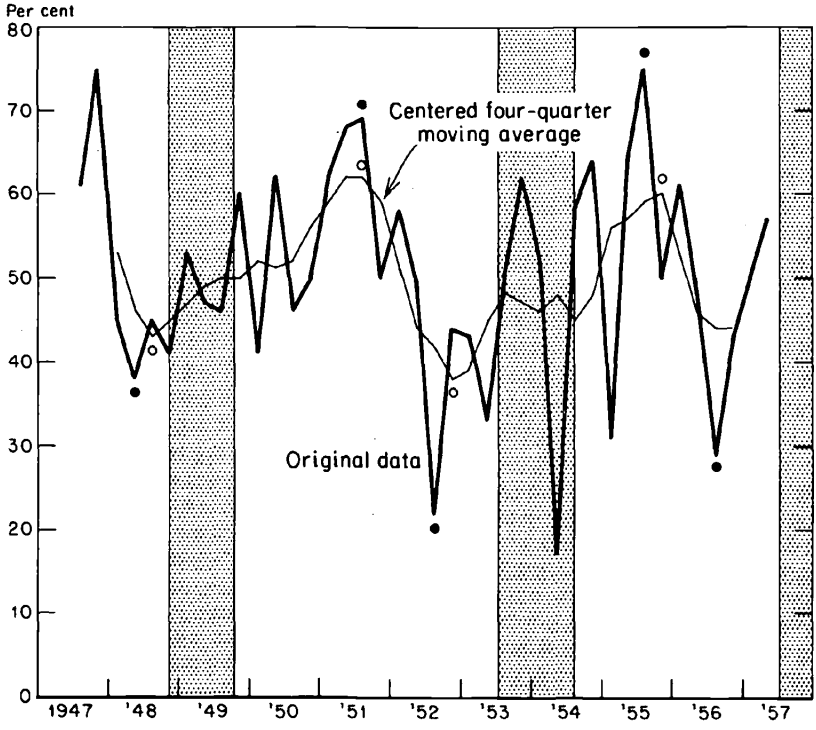
When the data are smoothed by a four-quarter centered moving average (the thinner line on Chart 6), the erratic fluctuations in the underlying figures largely disappear, and the turning points become more distinct. Three turning points appear a little later (each by one quarter) and one turning point is unaffected; we cannot be certain, of course, about possible additional turns at the beginning and close of the period.

Banks showing no change in the ratio between examinations were counted as one-half. All such instances were cases in which banks had no criticized loans at all in the two examinations being compared.

[8] Indeed, the individual bank data might have been centered in this way—i.e., the change in criticism rate being recorded at the midpoint of the interval between successive examinations rather than at the end of that interval.

CHART 6

Percentage of Banks with Rising Loan Quality, by Quarters, 1948-57



NOTE: A rise in loan quality means a fall in the criticism rate from that at the preceding examination. Shaded areas refer to reference cycle contractions according to National Bureau monthly chronology. Dots identify specific cycle turns in original data; circles identify specific cycle turns in the moving average.

SOURCE: Table 17. All data have been moved back two calendar quarters.

As already indicated, the diffusion index is a measure, based on a bank-by-bank count, of change in quality between successive examinations. Of the various measures of criticism rates (shown in Chart 2), it comes closest, in concept, to the rate of change of the per-bank ratios of substandard to business loans shown in panel B of Table 13. A distinct relation does, in fact, exist between the smoothed diffusion index and the year-to-year changes in that series (Chart 7). Moreover, when the unsmoothed diffusion index is cumulated (Table 18), thus in principle "generating" a moving average of criticism rates, the resulting series is fairly free from large erratic movements and, at least from 1950 on, conforms well to the per-bank criticism rates (Chart 8).[9] While these results are not conclusive, they establish a fairly strong presumption that a larger sample would confirm the existence of a meaningful quarterly pattern in examiner criticism rates.

TABLE 18

CUMULATED DIFFUSION INDEX OF LOAN QUALITY, 1948-57

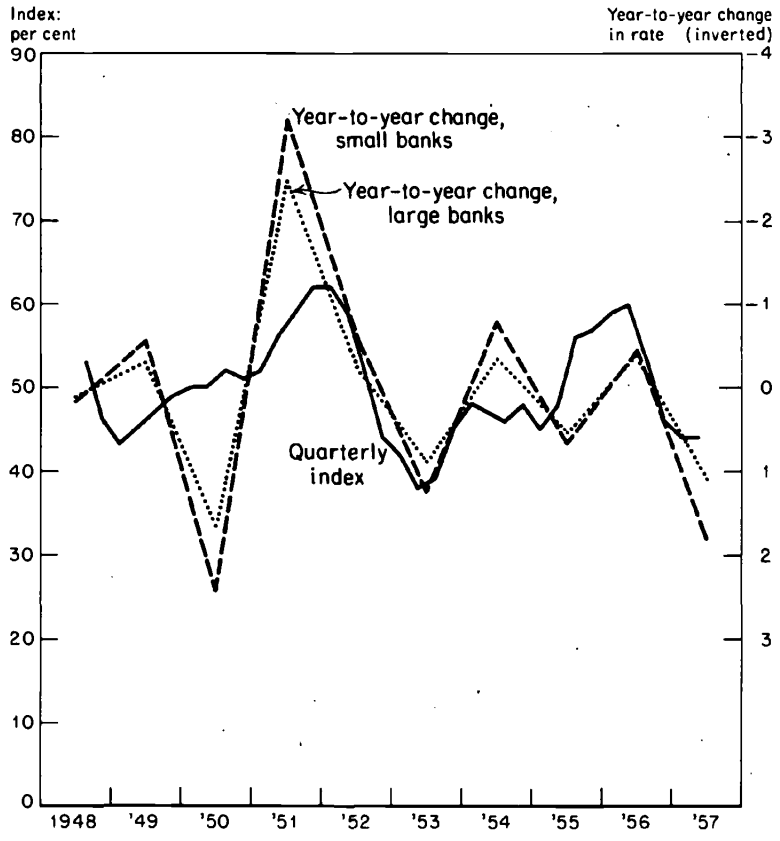
	Quarter			
	I	II	III	IV
1948	+11	+36	+31	+19
1949	+14	+ 5	+ 8	+ 5
1950	+ 1	+11	+ 2	+14
1951	+10	+10	+22	+40
1952	+59	+59	+67	+67
1953	+39	+33	+26	+ 9
1954	+ 9	+21	+23	−10
1955	− 2	+12	− 7	+ 7
1956	+32	+32	+43	+41
1957	+20	+13	+13	+20

SOURCE: Calculated from Table 17, top panel, by deducting 50 from each quarter and cumulating the remainder from quarter to quarter.

[9] The nature of this moving average may be illustrated as follows. Assume that observations existed for only one date each year, say, the first of the year. Centered observations for the year-to-year changes between successive annual observations would then be placed at midyear. Under these circumstances, accumulation of the diffusion index would "generate" a derived series of annual levels. This is in effect what has been done in the present case, except that data for year-to-year changes were available for four quarters a year rather than for just one date.

CHART 7

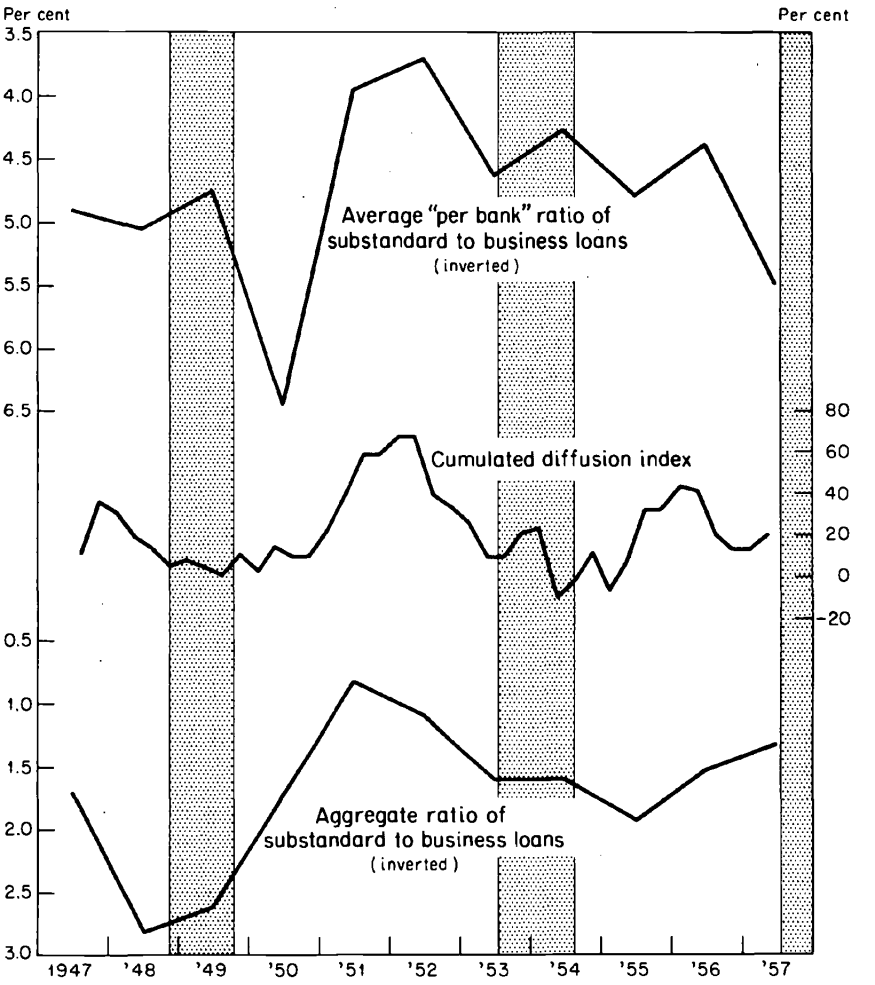
Smoothed Quarterly Index of Examiner Criticism Rates and Year-to-Year Changes in Criticism Rates, 1948-57



NOTE: Criticism rates refer to ratio of substandard to business loans.
SOURCE: Tables 13 and 17.

CHART 8

Cumulated Diffusion Index and Various Series of Criticism Rates



NOTE: Shaded areas refer to reference cycle contractions according to National Bureau monthly chronology.

SOURCE: Tables 12, 13, and 18. Cumulative diffusion index has been moved back two quarters for "centering" purposes.

Summary

In summary, bank loan criticism rates calculated from examiner reports not only contribute to the understanding of banking structure and developments but may also have some validity as summary indicators of changes in loan quality and as business cycle indicators. Fluctuations in criticism rates appeared to lead bank loan losses as well as some more inclusive indicators of credit quality. A quarterly "diffusion" index prepared from the data—the percentage of banks showing improvement in the criticism rate compared with their previous examination—showed a distinct cyclical pattern.