This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: Business Cycle Indicators, Volume 1

Volume Author/Editor: Geoffrey H. Moore, ed.

Volume Publisher: Princeton University Press

Volume ISBN: 0-870-14093-0

Volume URL: http://www.nber.org/books/moor61-1

Publication Date: 1961

Chapter Title: Cyclical Changes in Business Failures and Corporate Profits

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Chapter URL: http://www.nber.org/chapters/c0732

Chapter pages in book: (p. 350 - 385)

CHAPTER 12

Cyclical Changes in Business Failures and Corporate Profits

Victor Zarnowitz and Lionel J. Lerner

Facts and Problems

IT is well known that the mortality rate is always much higher for small and new firms than for large and old ones. Business failures, of course, also reflect general business conditions. Normally, this relation is inverse: casualties are apt to increase as business deteriorates and to decrease as it improves. At times, however, there are apparent inconsistencies in this relation, but these are easily resolved. For example, a period of prolonged prosperity during which the business birth rate is consistently high also may witness increases in the level of failures. This is because many of the newcomers, being ill prepared to assume the business risks in the first place, succumb early to financial difficulties, inadequate sales, or intensified competitive pressures.

But certain other facts about the cyclical behavior of failures are far more difficult to explain. Two findings are of particular interest here. First, there is the little known but well-established fact that liabilities tend to lead the numbers of failures cyclically. This implies that failures increase among larger businesses before they do among small ones, which on the surface seems rather strange. One might expect small concerns to show greater and earlier vulnerability to worsening business conditions than bigger companies. Second, the number of failing concerns that are relatively large in terms of liabilities tend to lead at the peaks and troughs of the business cycle. This can be inferred from the National Bureau studies of statistical indicators of business cycle turns: the series on aggregate liabilities of all failures, which is dominated by the failures of the larger concerns, was one of the twenty-one indicators selected by Mitchell and Burns in 1938 and by Moore in 1950.[1] But again this lead, firmly established as it is, has no immediately plausible reasons. It is not easy to see why a business recession should be *preceded* by an upturn in the

NOTE: The authors are indebted to Paul S. Anderson, Phillip Cagan, and Anna Schwartz for their very useful criticisms and comments. They owe a particularly great debt of gratitude to Geoffrey H. Moore for his many valuable suggestions. The paper also owes much to the statistical assistance of Nadeschda Bohsack.

[1] See Wesley C. Mitchell and Arthur F. Burns, *Statistical Indicators of Cyclical Revivals*, reprinted here, Chapter 6, and Geoffrey H. Moore, *Statistical Indicators of Cyclical Revivals and Recessions*, reprinted here, Chapter 7. For the full record of leads and lags of this series, 1879–1958, see Appendix B.

liability figures. At first blush, one would be rather inclined to assume that a rise in failures should *result* from, and thus *follow*, the onset of a business contraction.

In this study, the evidence for both of the above findings is reviewed. Historical patterns of cyclical behavior are presented and discussed for several series on the number of failures, their aggregate liabilities, and the average liability per failing concern. In a later section these patterns are used as analytical tools in examining recent fluctuations in failure data. We attempt to account for the findings by applying apparently relevant explanatory variables. In this context, hypotheses advanced in earlier studies of business failures are critically appraised and found in part complementary to our suggestions and in part unproven. In looking for reasons for the behavior of failures, both we and other authors emphasize profit variables. This is not surprising, since failure data can be regarded as a sort of profitability index. But the meaning and function of the profit variable are not the same in the different hypotheses we consider. Consequently we shall argue that behind the divergent views lies a significant difference in the interpretation of data on profit-and-loss experience.

Industrial and Commercial Failures During Business Cycles

The findings presented in this section are based on long historical records of business failures compiled by the commercial agency Dun and Bradstreet, Inc. (before 1933 by R. G. Dun & Co.). Quarterly totals of the number and liabilities of industrial and commercial failures reach back to 1875; monthly data start in 1894. These comprehensive series have been adjusted for seasonal variations and analyzed by the business cycle unit of the National Bureau. Certain component series in the same compilation, all monthly and beginning in 1894, also have been processed by the Bureau, viz. numbers and liabilities of the bankruptcies in the manufacturing and in the wholesale and retail trade sectors. For manufacturing failures, the record of numbers was studied separately for companies with liabilities under $100,000 and for those with larger liabilities. The same division into small and large firms in terms of liabilities is available for numbers of all industrial and commercial failures beginning in 1948.[2]

Before the acquisition of the Bradstreet Company by R. G. Dun & Co. in March 1933 (the merger that resulted in the formation of Dun and Bradstreet, Inc.), numbers and liabilities of total mercantile failures were

[2] The sources of the data are: *Dun's Review* (for figures before March 1933), *Dun and Bradstreet Monthly Review* (March 1933 to February 1937), and *Dun's Statistical Review* (thereafter). The most comprehensive totals include manufacturing and mining concerns, builders, employers of labor in mechanic arts, and trading companies; but not professional men, banks (after 1892), or railroads. After 1933 financial nonbank firms, such as brokers

also recorded by Bradstreet's. These series are available quarterly since 1882 and monthly since 1893; they were discontinued after January 1933. In contrast to Dun's statistics for most of the same period, Bradstreet's series cover all suspensions, including temporary ones, of banks and other financial institutions; but they purport to eliminate failures of real estate dealers and agents. Because of these differences and the early discontinuance of Bradstreet's records, the latter are not used in this study despite certain advantages they may have had over Dun's series in completeness and avoidance of duplications.

Using this bloc of data selectively, we shall first inspect the timing relations among the various failure series. This will provide evidence on the different behavior characteristics of small and large business casualties. We shall then present and review measures of the timing of the cyclical turns in the failure series at peaks and troughs of business cycles. The last set of measures to be examined in this section will show the changes in the average size of failures during general business fluctuations.

LEAD OF LARGE OVER SMALL FAILURES IN CYCLICAL MOVEMENT

When firms that fail are counted simply to determine their number, each of them receives an equal weight regardless of its size. On the other hand, adding up the liabilities of such firms amounts to weighting each failure by its size. The bulk of business casualties consists of small concerns, so that data on numbers reflect chiefly the behavior of the small failures. The larger failures, which are in the minority, are actually the intermediate size companies in the total business population. This is because the very big companies seldom find themselves driven to the wall; they find some other way out of their difficulties. Nevertheless, size differences among the failing firms are substantial, and the movements of the liability series are heavily influenced by changes in the "large" casualties. Accordingly, comparisons between the corresponding series on numbers and liabilities of business failures can be used to learn indirectly how the behavior of the small failures differs from that of the larger ones.

Timing comparisons of this sort are presented in Table 12.1 (lines 1–6) for failures in three major industry divisions: all industrial and commercial concerns, manufacturing companies, and trading companies. The table clearly demonstrates a tendency for the specific cycle peaks in the aggregate liabilities of all recorded failures to precede the corresponding peaks in numbers. At troughs the relation is similar but

and finance companies, have also been excluded. Covered as failures are concerns involved in court proceedings or voluntary actions which are likely to end in losses to creditors. The reported "current liabilities" differ from total liabilities in that they exclude the long-term, publicly held debt of the failing companies, such as bonds. These differences, however, are as a rule very small.

TABLE 12.1

Evidence on Timing Relations Between Large and Small Failures, 1878–1938

Industry and Period Covered[a]	Type of Turn (1)	*Number of Turns Covered in the* Specific Series[b] (2)	*Number of Turns Covered in the* Reference Series[c] (3)	*Number of Timing Comparisons That Are:* Leads (4)	Exact Coincidences (5)	Lags (6)	Rough Coincidences[d] (7)	Avg. Lead (−) or Lag (+) (months) (8)	Avg. Deviation from Avg. Lead or Lag (months) (9)
A. TIMING OF LIABILITIES AT TURNS IN NUMBER OF FAILURES									
1. All industrial and commercial companies, 1878–1938	Peaks	16	15	12	1		7	−5.4	3.9
2. Same	Troughs	15	14	7	2	3	5	−3.9	5.1
3. Manufacturing companies, 1895–1937	Peaks	13	8	7		1	7	−1.0	1.0
4. Same	Troughs	13	8	4	1	3	3	+0.5[e]	5.9[e]
5. Trading companies, 1894–1938	Peaks	10	11	6	2	1	4	−3.4	4.5
6. Same	Troughs	10	11	4	2	3	4	−1.4	4.7
B. TIMING OF NUMBER OF LARGE FAILURES AT TURNS IN SMALL FAILURES[f]									
7. Manufacturing companies, 1895–1932	Peaks	13	8	8			1	−6.4	3.5
8. Same	Troughs	13	8	4		4	3	0[g]	5.5[g]

SOURCE: R. G. Dun & Co. (after 1933, Dun & Bradstreet, Inc.). All series were adjusted for seasonal variations by the National Bureau.

[a] Identifies the complete specific cycle phases covered by the reference series (see note c).

[b] Entries in this column are for liabilities (A) and number of large companies (B).

[c] Entries in this column are total numbers (A) and number of small companies (B).

[d] Includes exact coincidences and leads or lags of one, two, or three months.

[e] These averages include one long lag of liabilities (of 16 months, at the 11/24 trough in numbers) which is of uncertain significance. If this comparison were excluded, the average would be a short *lead* of liabilities (−1.7) with an average deviation of 4.2 months.

[f] Large failures are companies with liabilities of $100,000 and over; small failures are those with liabilities under $100,000.

[g] These averages include one long lag of the large failures (of 11 months, at the 11/24 trough in the small failures) which is of uncertain significance. If this comparison were excluded, the average would be a short *lead* of large failures (−1.6) with an average deviation of 4.5 months.

weaker, i.e. the leads of liabilities tend to be shorter and less regular. The association is less strong in trading and considerably weaker in manufacturing. For trading companies, liabilities also lead numbers, especially at peaks, but on the average by shorter intervals than those observed in the comparison of the comprehensive series. In fact, at troughs the pair of trading series displays roughly coincident timing with only a slight tendency for the liabilities to lead. About the same can be said of the association between the peaks of the manufacturing series; the troughs here are on the average roughly coincident, too, but without any notable leading or lagging tendency.[3]

The timing records for all industrial and commercial failures thus suggest that cyclically business casualties begin to decline earlier among the larger than among the small firms. They also intimate that larger failures begin to increase earlier than small ones, but this lead seems to be shorter and less regular. When liabilities and numbers are compared for trading and manufacturing concerns separately, the evidence is for a short lead of larger failures or even only roughly simultaneous timing, the latter especially at troughs and in the manufacturing sector.

Direct comparisons between large and small failures provide the capstone in the testimony of Table 12.1. These are measures of the timing relation between two series on numbers of manufacturing failures, one representing companies with liabilities of $100,000 and over and the other companies with liabilities under $100,000. The record makes it plain that the specific cycle peaks for the former group (the "large failures") precede the peaks for the latter group.[4] At troughs, however,

[3] One implication of these differential timing relations at peaks and troughs is that the expansions in numbers of failures ought to be longer relative to the contractions than in the case of liabilities. This is borne out by the following figures (cycles during and immediately following World War I, 1914–21, are omitted):

	All Industrial and Commercial Failures		*Manufacturing Failures*		*Trading Failures*	
	Number	*Liabilities*	*Number*	*Liabilities*	*Number*	*Liabilities*
Number of complete specific cycles	13	14	6	10	9	8
Period covered by specific cycles	1878–1938	1875–1938	1896–1937	1896–1938	1896–1938	1896–1938
Average duration (months)						
Expansions (E)	26.8	24.2	41.5	18.3	22.9	25.0
Contractions (C)	21.8	22.6	26.8	23.6	23.0	26.0
Ratio of average durations (E ÷ C)	1.23	1.07	1.55	0.78	1.00	0.96

[4] Of the eight observations here, all are leads of the larger failures (line 7). All but two fall in the relatively narrow range of 4 to 7 months, with a median lead of −4.5.

the timing of the two series is again found to be roughly coincident; if there is any tendency here for the companies with greater liabilities to lead those with smaller liabilities, it is a weak one (line 8).[5]

The systematic timing differentials established in Table 12.1 for the sixty years before World War II persisted in the years after the war. Chart 12.1 presents two pairs of monthly series beginning in 1948: liabilities and numbers of all industrial and commercial failures, and numbers of all failures with liabilities of $100,000 and over and of those with liabilities below $100,000. Since the chart will be used later for comparisons between the cyclical timing of the failure series and the timing of general business fluctuations, it is convenient to present the series on an inverted basis. The first two curves show total liabilities moving earlier than total numbers as well as in wider swings. The two curves beneath them tell essentially the same story: the numbers of larger failures lead those of small failures and also have greater cyclical amplitudes. The only major exception to this pattern is the simultaneous timing of these series at the 1958 business revival, when all four of them turned upward together in April. The following tabulation lists the recent turning dates in these series and shows the lead of the liabilities or large failures.

Date of Turn in Cyclical Movements of Inverted Series

	Peak	Trough	Peak	Trough	Peak	Trough
All indus. and commer. failures						
Liabilities	Apr. 1945	Apr. 1949	Mar. 1951	Mar. 1954	May 1955	Apr. 1958
Number	Dec. 1945	Nov. 1949	Aug. 1952	Mar. 1954[a]	Apr. 1955[b]	Apr. 1958
Lead (−) or lag (+) of liabilities (months)	−8	−7	−17	0	+1	0
No. of failures with liabilities of $100,000 and over		Aug. 1949	Aug. 1950	Oct. 1953	Oct. 1954	Apr. 1958
No. of failures with liabilities under $100,000		Nov. 1949	Dec. 1952	Mar. 1954[a]	Sep. 1955[b]	Apr. 1958
Lead (−) or lag (+) of large failures		−3	−28	−5	−11	0

[a] Beginning of a retardation.
[b] End of retardation.

LEAD OF LARGE FAILURES AT BUSINESS CYCLE TURNS

Table 12.2 presents timing comparisons between cyclical upturns (downturns) in the failure series and peaks (troughs) in aggregate economic activity, as represented by the "reference dates" of the

[5] In the discussion of the draft of this paper, the question was raised whether the lead of larger over small failures could not be due to the trend. This argument, however, must be dismissed. It is true that rising prices would tend to increase the number of failures with greater liabilities compared with the total number of failures. Among manufacturing failures (the series included in Table 12.1, line 7), companies with liabilities of $100,000 and over show indeed a stronger upward trend than companies with smaller liabilities, although the difference is not large. But such differential trends could only accentuate the lead of larger failures *at troughs*; at peaks they would on the contrary work toward a *shorter* lead or even a lag of companies with greater liabilities. (The presence of a *rising* trend tends to make the peaks in a series come *later* and the troughs *earlier*.) But, as shown in Table 12.1, it is at peaks rather than at troughs that the larger failures lead.

TABLE 12.2

Eight Series on Liabilities and Number of Business Failures, Timing at Business Cycle Turns, 1879–1938[a]

Series	Type of Turn (1)	Number of Reference Turns Covered (2)	*Number of Timing Observations That Are:* Leads (3)	Exact Coincidences (4)	Lags (5)	Rough Coincidences[b] (6)	Avg. Lead (−) or Lag (+) (months) (7)	Avg. Deviation from Avg. Lead or Lag (months) (8)
LIABILITIES OF BUSINESS FAILURES								
1. All industrial and commercial companies	Peaks	14	11	1	1	2	−10.5	8.0
2. Same	Troughs	16	14		1	1	−7.5	3.4
3. Manufacturing companies with liabilities under $100,000	Peaks	10	6		1	3	−7.9	6.1
4. Same	Troughs	11	6		2	3	−4.5	5.8
5. Manufacturing companies with liabilities of $100,000 and over	Peaks	10	9	1		4	−5.8	4.0
6. Same	Troughs	11	8		3	3	−5.2	4.7
7. Trading companies	Peaks	10	6	1	2	3	−5.3	6.7
8. Same	Troughs	11	7		3	3	−3.5	5.3
NUMBER OF BUSINESS FAILURES								
9. All industrial and commercial companies	Peaks	14	8		5	6	−5.0	6.8
10. Same	Troughs	16	7		8	4	−0.5	6.7
11. Manufacturing companies with liabilities under $100,000	Peaks	10	5		2	2	−6.9	5.6
12. Same	Troughs	11	5		3	4	−2.0	4.5
13. Manufacturing companies with liabilities of $100,000 and over	Peaks	10	8	1	1	4	−5.1	4.9
14. Same	Troughs	11	8		3	1	−6.9	6.1
15. Trading companies	Peaks	10	4	1	4	6	−0.4	2.9
16. Same	Troughs	11	4		7	4	+1.4	5.2

SOURCE: R. G. Dun & Co. (after 1933, Dun & Bradstreet, Inc.). All series were adjusted for seasonal variations by the National Bureau. All series are inverted with respect to business cycles, i.e. their peaks are compared with reference troughs and their troughs with reference peaks.

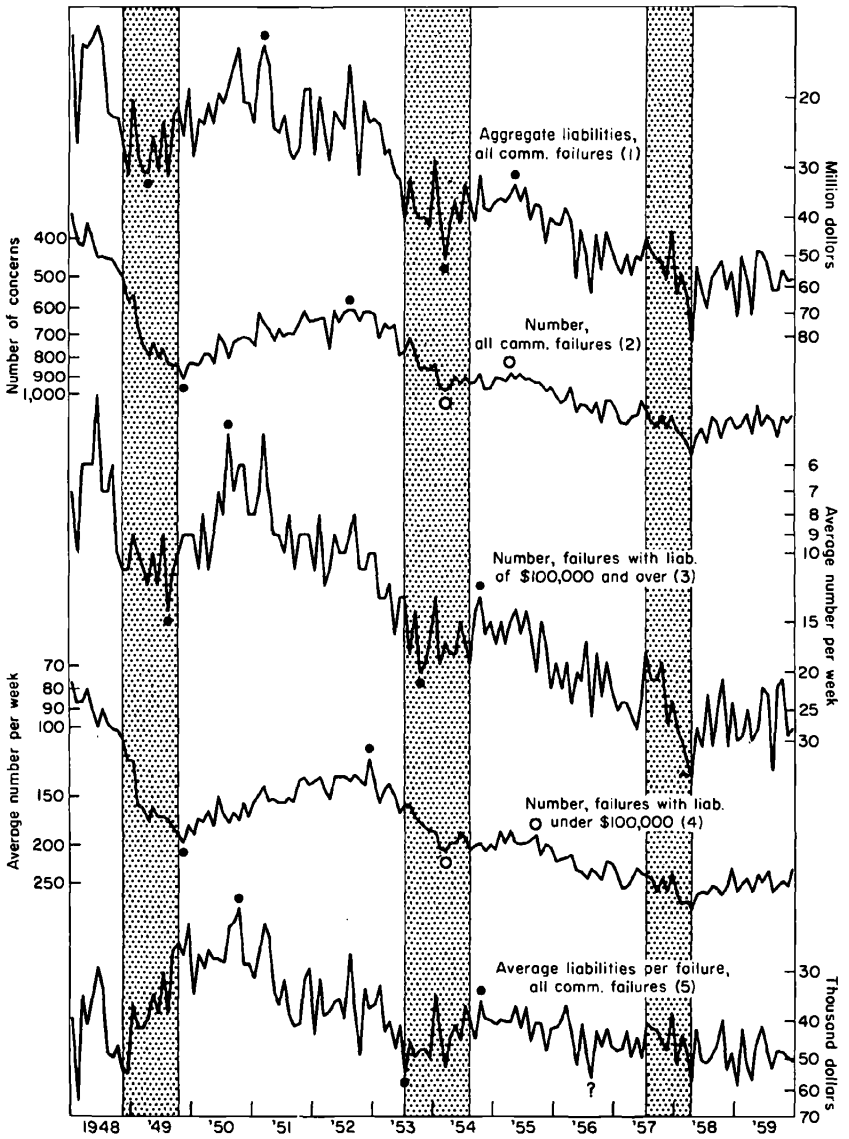
[a] The complete reference cycle phases covered were 1879–1938 for all industrial and commercial companies and 1895–1938 for all other series. War cycle observations (timing comparisons at the 1918 peak, 1919 trough, and 1920 peak) are omitted.

[b] Includes exact coincidences and leads or lags of one, two, or three months.

CHART 12.1

Aggregate Liabilities, Numbers, and Average Liabilities of Business Failures, 1948–59

(all series are plotted on inverted scales)



Shaded areas represent business contractions; unshaded areas, expansions.

Data are seasonally adjusted directly except for series (5), which is computed by dividing series (1) by series (2).

Dots identify peaks and troughs of specific cycles.

Circles identify retardations.

SOURCE: Dun and Bradstreet, Inc.

National Bureau.[6] The four series of liabilities (lines 1–8) are clearly leading series. The first and most comprehensive of them, covering industry as well as trade, shows the longest average leads, of over ten and seven months at business cycle peaks and troughs, respectively. Liabilities of the small and of the larger manufacturing failures follow with shorter leads averaging about five to eight months, and liabilities of the trading failures rank last but still have mean leads of more than five and three months.

Typically, the liability series gave earlier notice of an approaching cyclical recession than of a revival, and they preceded both by substantial intervals. In contrast, number of all failures and number of small manufacturing companies turn early at business cycle peaks only; at troughs, their timing is roughly coincident, with averages just a little on the leading side. Their leads at peaks, too, are shorter than those in the corresponding liability data. Moreover, the timing of the number of trading failures is roughly coincident at both peaks and troughs. It is evident that these series—simple counts of business casualties most or all of which are small—lack the pronounced character of leading indicators that the liability series have (compare lines 9–12 and 15–16 with 1–8).

There is, however, one series of numbers that does show long leads, at general business revivals as well as recessions. This—notably but not surprisingly—is the series of larger manufacturing failures. It has anticipated sixteen of the twenty-one recessions and revivals of the period covered (1895–1914, 1921–38) and matched all of them. Its average leads (five to seven months) are of the general order of the leads in liabilities of manufacturing failures.

To judge from the above evidence, the tendency for turns in liabilities to anticipate general business reversals reflects the early timing of failures of larger companies. At cyclical revivals, the lead in liabilities is due entirely to this factor. Failures of small concerns do not show any marked inclination to lead upturns in business, but rather tend to coincide roughly with them, in some industries even with a slight lag.[7] At cyclical recessions, small manufacturing failures do show a substantial average lead, but its representativeness may be questioned. (The same applies to the number

[6] Comparisons at three business cycle turns in 1918–20 are omitted (see Table 12.2, note a). During this period dominated by war and immediate postwar developments, fluctuations well outside the usual range marked the course of business failures; it seemed advisable not to let them influence our average timing measures lest they impair their representative value.

[7] See the short average lag in the number of trading failures, Table 12.2, line 16. On the average, the size of a trading failure in terms of liabilities is just about one-third of the size of a manufacturing failure, or somewhat less than the typical size of a small manufacturing failure (in the less than $100,000 category). Hence this series provides a particularly good representation of small business casualties. It should also be noted that trading failures account regularly for a heavy proportion of the total number of failures.

of all failures; see the distributions by type of the timing observations in lines 9 and 11.) The upturns in trading casualties occurred after as often as before the peaks in business, usually in their close vicinity (line 15).

To sum up, Table 12.2 provides ample evidence, direct and indirect, for the long lead of larger failures which, it was noted, are really intermediate-size firms. Apparently most of them are industrial, a few are trading concerns. This is numerically a small group, and, although its importance in the present context is by now evident, there seems to be little point in trying to analyze it into still smaller components.[8]

Again, the timing characteristics of the failure series as seen in Table 12.2 for the pre-World War II period persisted in the cyclical fluctuations of the past decade. Chart 12.1 shows that liabilities of all business failures (inverted) turned up several months before the business revivals in both 1949 and 1954. Their first postwar rise ended early in 1951, more than two years before the business recession of mid-1953; their second rise ended early in 1955, more than two years before the July 1957 downturn in aggregate economic activity. The inverted number of large failures, too, shows leads at the business troughs in 1949 and 1954, and early resumptions of the prevalent downward trend in 1950–51 and toward the end of 1954. On the other hand, the timing of numbers of all failures and of small failures was roughly coincident with the 1949 business revival, rather than leading it. The last recorded specific cycle peaks in these series occurred late in 1952, and the 1953–54 recession was skipped here. (Nevertheless, the 1954–55 retardations in these series are worthy of notice.) Again, the only exception to the patterns observed in the past is the simultaneous timing of all four series at the April 1958 revival in economic activity. The timing measures are listed at top of page 361.

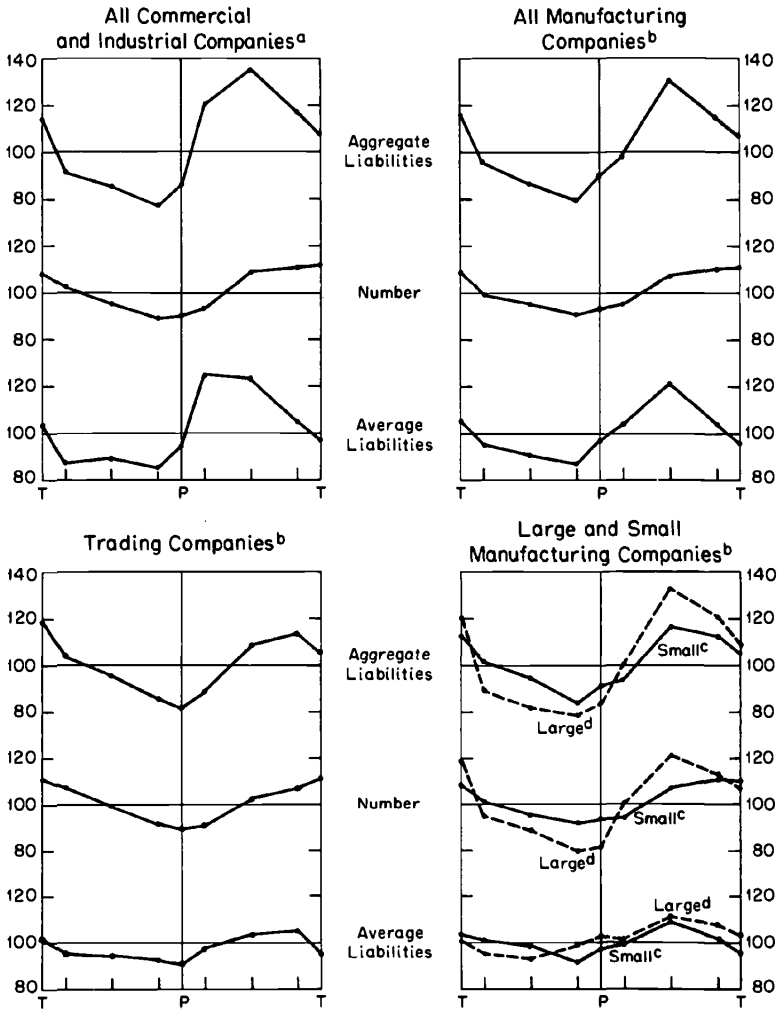
CHANGE IN AVERAGE SIZE OF FAILURE OVER THE CYCLE

Although this study is concerned mainly with cyclical timing, some attention should be given to the fact that liabilities and numbers of

[8] Earlier response to business developments and higher cyclical conformity need not necessarily go together, but it should not be surprising if they often do. An interesting by-product of the analysis of manufacturing failures may be noted in this connection. The reference expansions and contractions have been ranked according to their vigor or severity, as measured by the average amplitudes in three indexes of business activity, AT & T, Persons', and Ayres'. All the "major" expansions and contractions (those with high amplitudes in the combined index) have corresponding specific cycle movements in all series on liabilities and numbers of manufacturing failures. But the sensitivity to the "minor" expansions (those beginning in 1900, 1912, 1919, and 1927) is considerably greater for the series representing larger failures than for those representing small failures, and the same can be said of the "minor" contractions (which began in 1899, 1902, 1910, and 1926). Thus liabilities of all manufacturing companies and number and liabilities of large companies match all the turns that bracket the "minor" phases. But the other series—number of all companies and number and liabilities of small companies—match no more than half of them. Each of these series "skips" either the initial or the terminal turn in each of the above-specified reference phases.

CHART 12.2

Average Reference Cycle Patterns of Selected Series on Business Failures



[a] Average 14 cycles, 1879–1914, 1921–38.
[b] Average 10 cycles, 1894–1914, 1921–38.
[c] Manufacturing companies with liabilities under $100,000.
[d] Manufacturing companies with liabilities of $100,000 and over.

	LEAD (−) OR LAG (+) IN MONTHS				
	Date of Business Cycle				
	Trough Oct. 1949	Peak July 1953	Trough Aug. 1954	Peak July 1957	Trough April 1958
All industrial and commercial failures					
Liabilities	−6	−28	−5	−26	0
Number	+1	−11	[a]	[b]	0
No. of failures with liabilities of $100,000 and over	−2	−28	−10	−33	0
No. of failures with liabilities under $100,000	+1	−7	[a]	[c]	0

[a] No corresponding specific turn; beginning of a retardation leads the business trough by 5 months.

[b] No corresponding specific turn; end of a retardation 27 months before business peak.

[c] No corresponding specific turn; end of a retardation 22 months before business peak.

failures also differ in their rates of change during business expansions and contractions. As a result of these differences, the average size of failure (measured by liabilities) fluctuates systematically over the course of the business cycle. What is the typical pattern of this change?

Data to answer this question could be derived by dividing the figures on liabilities by the numbers for the same month to obtain new series representing average liabilities. (See, for example, line 5 in Chart 12.1.) These could then be subjected to cyclical analysis. A much less laborious procedure, however, is to work directly with the "reference cycle patterns" for the corresponding series of liabilities and numbers. Such patterns portray the behavior of the data during certain historical episodes. Each of them represents a segment of the series covering one business cycle, usually measured from trough to trough. They are among the basic measures that are assembled for each series analyzed in the business cycle research program of the National Bureau.[9] Instead of taking ratios of monthly values, we may then divide liabilities by numbers, using for both variables entries in reference cycle patterns. All that this simple operation presupposes is that these figures pertain to the same periods, i.e. that they be matched stage by stage for each successive business cycle. This is a short-cut method, but it should suffice for our present purposes.[10]

Chart 12.2 presents a graphic summary of the behavior of failure

[9] For an outline of the method of computing the reference cycle patterns, see Chapter 7, section III. For full discussion of the method, see Burns and Mitchell, *Measuring Business Cycles*, pp. 160–170.

[10] Let L_{sr} be the standing (an average in reference cycle relatives) of a series on liabilities in a given stage s of a given reference cycle segment r. Similarly, let N_{sr} be the standing of the corresponding series on numbers in the same stage and segment. Then we decide to treat $A_{sr} = \frac{L_{sr}}{N_{sr}} \times 100$ as the standing, at the given s and r, of a series on average

series from stage to stage of the business cycle. The summary is based on all reference cycle patterns that can be computed for the period before the 1938 revival from Dun's historical statistics of business casualties (except that the observations for the two reference cycles between 1914 and 1921 are omitted throughout because of the special character of this war-dominated period in the history of failures). The chart is confined to the *average* reference patterns, but as a working device we have plotted the underlying patterns for individual cycles in order to examine their deviations from the average set. Such deviations are net resultants of numerous factors and are usually considerable. This is because business cycles differ greatly in duration, diffusion, and intensity of their expansions and contractions, and any economic process and its cyclical reactions change over time. The patterns for the failure series offer no exception to this rule. Indeed, those for aggregate liabilities reveal particularly wide differences in the amplitudes of expansions and contractions between the "strong" and the "weak" cycles. In periods of severe financial strain, such as the years 1893 or 1908, high-rising waves can be seen in the patterns of liabilities. At other times, during "minor" cycles, fluctuations in these patterns are much milder and often more irregular.[11] Despite these and other differences, however, the successive patterns for each of the failure series examined have much in common; certainly they tend to preserve at least the *direction* of their stage-to-stage movement. Averages struck for many cycles make these shared features stand out more clearly, while the peculiarities of any single pattern are subdued.

Chart 12.2 shows that generally aggregate liabilities of business failures decrease during reference expansions and increase during contractions, but typically with a one-stage lead at peaks and a two-stage lead at troughs.[12] The patterns of numbers, which also of course conform inversely

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liabilities. This procedure will not, as a rule, yield the same results as the complete approach which starts with the original or seasonally adjusted data. It is easy to show that the two would give equal results only if in each stage of each cycle $\sum^{m} l \Big/ \sum^{m} n = \sum^{m} \frac{l}{n} m$.

(Here m is the number of months in the stage, and l and n are the appropriate seasonally adjusted figures on liabilities and numbers of failures, respectively.) There is, however, no systematic bias in using the short-cut method.

[11] In an unpublished manuscript (approximate date, 1931–32), Wesley Mitchell observed that "if a case can be made out for distinguishing between major and minor trade fluctuations as two sets of phenomena which should be studied separately, Bradstreet's series for liabilities will afford one of the strongest exhibits." This statement refers to a series which was not used for documentation in this paper, but we find that it can also be applied (though perhaps somewhat less forcefully) to Dun's series.

[12] Liabilities of trading companies provide an exception: their average pattern shows no lead at peaks and only a one-stage lead at troughs. It will be noted that timing measures expressed in overlong and variable units such as the reference cycle stages are coarse. Timing differences that are brought out well by measures of leads and lags in months are at best only approximated, and often blurred, by measures expressed in stages. This

with business cycles, are without exception flatter than the corresponding patterns of liabilities, that is they decline proportionately less as business improves and rise less as it deteriorates. (This is seen clearly in Chart 12.2, in which all patterns are drawn on the same scale of amplitude.) Hence the average liabilities per failure tend to diminish as prosperity advances and virtually always increase during a general recession.

Another regular feature of the patterns in Chart 12.2 is that the typical interstage movements in the average size of failure resemble the corresponding changes in aggregate liabilities much more than the changes in numbers. In general, changes in the average size of failure contributed more than those in numbers to the amplitude of movement in aggregate liabilities. This can be seen clearly from the accompanying figures for all industrial and commercial casualties (1879–1914, 1921–38):

	Expansion Interval in Ref. Cycle Stages	AVERAGE CHANGE IN REFERENCE CYCLE RELATIVES DURING STAGES MATCHED WITH *Reference Expansion*		*Reference Contraction*	
		Total Change	Avg. Change per Month	Total Change	Avg. Change per Month
Average liabilities	IV–VII	−50.1	−1.73	+38.0	+3.04
Number	V–IX	−17.8	−0.56	+21.6	+1.22
Aggregate liabilities	IV–VII	−74.5	−2.23	+57.8	+4.39

In terms of reference cycle stages, average liabilities tend to have the same timing as aggregate liabilities of all failures: for both series the typical expansion interval covers the stages IV–VII.[13] Thus the average size of failures, like their liabilities, leads the business cycle and the turning points in the numbers series. This is also the rule in timing relations among the corresponding series for the component categories of business failures.

The cyclical behavior of average liabilities in the post-World War II period reaffirms broadly the findings based on the prewar data. The curve at the bottom of Chart 12.1, plotted, the reader will recall, on an inverted basis, shows that the average size of a business failure fluctuated in a

is clearly demonstrated in the present case: compare the average leads of failure liabilities in trade as given in Table 12.2—5.3 and 3.5 months at peaks and troughs, respectively—with the above-mentioned timing characteristics of the average pattern for the same series. But it is only for the average liabilities that we shall have to rely exclusively on timing classifications in terms of stages, due to our use of the short-cut method of reference cycle patterns. And for our present limited purpose of broadly comparing the behavior patterns of certain failure series, measurement in stage units can be considered adequate.

[13] The stages during which a series typically expands and those during which it typically contracts are determined by careful examination of its patterns for all the reference cycles covered (see Burns and Mitchell, *Measuring Business Cycles*, pp. 185–197). The resulting division of the cycles into typical expansion and contraction intervals is usually very similar to the division of the average reference cycle pattern, but not necessarily identical.

manner resembling the movements in aggregate liabilities, although with a tendency to lead the latter. Changes in the average size outweighed strongly the changes in the number of failures in influencing the timing and the amplitude of the total liability series.

Hypotheses on Business Failures

Although statistical records of business failures are long and rich in detail and have attracted considerable interest, some of the problems they pose are still without any or without a satisfactory explanation. In this section, previous work on the economic aspects of failures will be reviewed briefly to the extent that it bears on the cyclical relations with which the present paper is concerned.

Some investigators have emphasized the causes of the failure of *individual* business enterprises. Analysts of Dun and Bradstreet, Inc., the agency to which we are indebted for the failure statistics, list as the "underlying causes" of failures such factors as neglect, fraud, lack of experience, and disaster. They classify as the "apparent causes" such factors as poor health, irregular disposal of assets, inadequate sales, excessive fixed assets, competitive weakness, strikes, and others. Percentage distributions of failures from causes of both types, derived from annual surveys of the agency's credit reports and creditors' opinions, are available for a number of years in Dun and Bradstreet publications. The conclusion regularly drawn from these data is that in practically all cases (97.8 per cent in 1953) ". . . the underlying reasons for failure were directly related to identifiable human weaknesses of the individuals who owned the businesses. . . ."[14] Field studies of this sort are interesting from the viewpoint of credit analysis which aims at revealing a firm's operating position, but they are of little help for an aggregate cyclical analysis. "Identifiable human weaknesses" exist in all phases of the business cycle. Being ever present, factors such as fraud or mismanagement surely do not explain why failures should begin to increase precisely at the time when the business cycle is approaching its peak. However, the existence of elements in marginal firms predisposing them to failure does help to explain why these concerns are especially sensitive to signs of worsening conditions that may appear long before the wave in aggregate economic activity has reached its crest.[15]

[14] *The First Five Years are the Hardest!* (Dun and Bradstreet, Inc.), New York, 1954. The percentage attributed to "human weaknesses" in other years was not significantly different from the above figure (usually above 95 per cent).

[15] A classification of causes of failure bearing some resemblance to that of Dun and Bradstreet was made by Melville J. Ulmer and Alice Nielsen for the Office of Business Economics (see *Survey of Current Business*, April 1947, pp. 10–16). This study was based on a stratified sample of 1,650 firms sold or liquidated in the second quarter of 1946, 550 of which were classified as "failures," i.e. closures made to avoid losses or because of inability to make a profit. (This definition is broader than the one underlying the basic

MITCHELL'S ANALYSIS OF BUSINESS FAILURES

As early as 1913, Wesley Mitchell gave a brief account of business failures as a cyclical phenomenon. He noted that most failures that occur during years of prosperity are accounted for by difficulties such as mismanagement and lack of capital, which difficulties are common primarily among small firms. When business at large takes a turn for the worse, however, additional troubles arise which are due to factors beyond the control of the firms affected and beset large as well as small enterprises. Hence the average liabilities of failing concerns regularly increase during business recessions and contractions.[16]

In an unpublished fragment quoted in footnote 11 above, Mitchell states that ". . . the failure of large concerns is a closer function of financial strain than the failure of small concerns." The reference here is apparently to high interest rates and other forms of monetary stringency. Later in the same passage attention is drawn to the fact that *liabilities* of business failures did not rise as high in 1920–21 as in 1893 and 1907. But the *number* of failures showed far larger fluctuation in 1915–21 than in any earlier cycle covered by the record. Mitchell concludes that the moderation of financial strain effected by the Federal Reserve System (which was established in 1913) prevented a greater increase in liabilities, but not in numbers, in the severe business contraction of 1920–21.

Mitchell's notes on business failures share one quality characteristic of all his research in that they are focused on an important finding. In this case, it is the difference between the cyclical behavior of small and large failures. Mitchell's analysis does provide a general answer to why the *average* size of failure has an inverted cyclical pattern. It is plausible that in times of deteriorating business some larger companies would be driven to the wall; and, of course, smaller companies fail in this, as well as in other, phases of the cycle. The "financial strain" undoubtedly belongs among "conditions beyond the control of the firms affected." It is not necessary, however, to suppose that bigger concerns are more sensitive to general financial pressures than small concerns. Indeed, it is

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Dun and Bradstreet data which cover primarily bankruptcies and presuppose "likely" or actual losses to creditors.) Ulmer and Nielsen distinguish "immediate" and "fundamental" causes of failure but deal principally with the former. The fundamental causes are attributes of unsuccessful, marginal concerns. Firms with such characteristics (e.g. inadequate record keeping, inexperienced management, poor location) are among those failing regardless of general business conditions. The immediate causes are those that from time to time "activate" the fundamental factors and "transform marginal firms into failures." In 1946 economic conditions were very favorable and failures low. Among the reported immediate causes of failures, the principal one was scarcity of merchandise and materials, followed by labor shortage. In duller seasons other causes, such as sales difficulties, would no doubt be more important.

[16] Mitchell, *Business Cycles*, Part II, p. 438.

not clear why they should be, and it could be argued that larger companies are probably better equipped to withstand such pressures.[17] The point is that, as an explanation of the behavior of average liabilities, it is sufficient that larger companies be less sensitive than small ones to factors accounting for most failures in times of prosperity.

Of considerable interest are Mitchell's comments on the effect upon failures of the organization of the Federal Reserve System, but this matter is rather aside from the train of thought of this paper. It might be noted, though, that the contrast between the cycles of failure liabilities in the years before the FRB and those thereafter is clearly evident, for instance, in the data we have used to measure changes in the average size of business casualties.[18] But easing of financial strain by legislative reform of the banking system is only one of the possible explanations of the observed contrast. Other hypotheses could be suggested with which the findings are not inconsistent, e.g. larger companies may have grown relatively stronger and more resistant to cyclical misfortunes in the periods covered by the more recent "major" cycles.

Mitchell's contribution to the cyclical analysis of business casualties, then, was mainly to bring out and explain the contrast between small and large failures in their cyclical sensitivity, or the relative *size* of their fluctuations. His account does not clarify the problem of the *timing* of failures at business cycle turns. It does not explain how liabilities can increase well *before* either the onset of a "crisis" or the upturn in the number of casualties. We shall now consider a recent attempt to account for the intriguing earliness of the turning points in liabilities of failures.

CYCLICAL TIMING OF PROFIT MARGINS AND FAILURE LIABILITIES

Since it is the least profitable firms that are most prone to fail, a general deterioration in the operations of these marginal concerns tends

[17] True, one might also contend that, while larger concerns can withstand risks arising from tight credit more easily than small ones, this very fact may cause them to deliberately assume bigger risks, especially in boom times, thereby making them more vulnerable to weaknesses in business conditions not yet reflected in the current economic trends. This may be related to certain notions about the early deterioration in the quality of credit in the business cycle. As a version of the "financial strain" hypothesis, however, it seems to be rather far-fetched.

[18] The increase in average liabilities was much smaller in the 1919–21 reference cycle than in the 1891–94 or 1904–08 ones. Even in the 1927–33 period, with its severe contraction, average liabilities increased rather moderately.

In this connection, it would also be useful to analyze the cyclical record of bank failures, which is available for the forty years before 1933. Both the numbers and liabilities of suspended banks show leads relative to business cycle turns which are frequently longer than those shown by liabilities of business failures. This suggests an association between larger business failures and strain in financial markets. Since 1933, of course, this particular manifestation of financial strain, i.e. bank failures, has become negligible.

to be associated with a rise in business casualties. As shown by Paul B. Simpson and Paul S. Anderson,[19] failure liabilities were indeed closely related to the fifth percentile of corporate profits (the level of deficit exceeded by only 5 per cent of all corporations). Over the period 1927–50, a correlation as high as .97 was obtained for annual data (in current dollars) on liabilities of *all* commercial and industrial failures and losses of the fifth percentile *corporate* firms.[20]

Despite its limitations, this evidence should be adequate to support the general statement, which is anyhow highly plausible, that failure rates reflect the profit-and-loss experience of firms operating at the margin of profitability or beyond it, i.e. with losses. This implies that profits of marginal and submarginal concerns tend to lead at the business cycle turns, as failure liabilities do. This still does not explain the early timing of the liabilities; and the question why numbers should turn later becomes if anything still more puzzling. Thus what we note at this point is only a shift to the question: why should the profits of unsuccessful concerns lead the business cycle?[21]

Simpson and Anderson submit that the key lies in profit margins (profits as a percentage of sales), which are supposed to precede the business cycle and to govern the behavior of the profits of marginal firms. Profits of the more prosperous companies differ from those of the unsuccessful businesses in that they are less influenced by profit margins and more by sales volume. The authors then assume that profit margins lead sales at peaks and troughs for both the concerns that do well and those that do poorly. They submit that this would imply leads in the profits of

[19] "Liabilities of Business Failures as a Business Indicator," *The Review of Economics and Statistics*, May 1957, pp. 193–199.

[20] The measure of profits of the fifth percentile (which were negative for all years covered) was constructed from data in *Statistics of Income*. These data are not strictly comparable with those for business failures in that they include only corporations.

[21] It should be noted that the comparison between failure liabilities and losses of unprofitable corporations has the usual limitation of comparisons of annual time series. It cannot establish the type of timing relation between the two variables except in very crude terms. For closely related activities, major turns in annual data would be expected to fall in most cases in the same year. But leads or lags of 12 months are the shortest that can be shown, while those of 24 months are the longest that are still meaningful for an analysis of cyclical relations. Moreover, annual data not only make the timing measures imprecise, they also often twist the actual cycles. (Cf. Burns and Mitchell, *Measuring Business Cycles*, pp. 223–225, and note that there the comparisons with annual series can be improved by using *monthly* reference dates so that the source of error is smaller than here where *two* annual series are used.) In the present case, losses led failures in 1929, 1937, and 1945, and the two series turned together in 1932, 1938, 1949, and 1950. (Cf. Simpson and Anderson, "Liabilities of Business Failures," Chart 3.) It is notable that each of the three leads occurred at peaks. (Of the coincidences, three were at troughs, and one at a peak.) Thus there is a suggestion here of a tendency of the loss series to lead failure liabilities at peaks, though not necessarily at troughs.

marginal firms relative to the profits of better off companies and total profits.[22]

This formulation, however, holds only under certain quite restrictive conditions which should be made explicit. It is not enough for the validity of the Simpson-Anderson argument that profit margins and sales volumes change in the same direction for profitable and unsuccessful companies in the vicinity of either turn. It is also necessary that these two variables and their derivatives with respect to time have such relative magnitudes, for profitable companies, as to make the total profits for this group increase at the end of an expansion and decrease at the end of a contraction.[23]

Using period analysis rather than continuous analysis and allowing for the possibility that either m or v or both do not change continuously or smoothly, it is easy to construct a model in which the profits of successful concerns and the losses of submarginal concerns turn simultaneously. The assumptions under which this result is obtained are not necessarily less realistic than those which would yield a lead of the losses.[24]

[22] In its briefest form (*ibid.*, footnote 7), the argument runs as follows: "Let $p = mv$, where p is total profits, m is the profit margin, and v is sales volume. Then, $dp/dt = v\,dm/dt + m\,dv/dt$. At the end of a prosperity period we may have dv/dt positive and dm/dt negative. Then only firms with a sufficiently large positive m will have a positive or zero dp/dt. Other less prosperous firms will be suffering lower profits, and their profits will lead aggregate output and profits. Similarly at the close of a depression, we may have dv/dt negative and dm/dt positive. Then a submarginal firm with negative m may have increasing dp/dt, whereas a more prosperous firm has negative dp/dt. Thus profit experience of the submarginal firm leads total profits."

[23] This is demonstrated by the accompanying tabulation of signs assumed by each of the variables in the Simpson-Anderson equation $v\frac{dm}{dt} + m\frac{dv}{dt} = \frac{dp}{dt}$.

		Direction of Change in:			
	v	$\frac{dm}{dt}$	m	$\frac{dv}{dt}$	$\frac{dp}{dt}$
1. End of expansion					
(a) Unsuccessful firms	+	−	−	+	−
(b) Profitable firms	+	−	+	+	+ or −
2. End of contraction					
(a) Unsuccessful firms	+	+	−	−	+
(b) Profitable firms	+	+	+	−	+ or −

It will be noted that it is possible for the profitable concerns—with $m > 0$—to have $dp/dt < 0$ at the end of an expansion (if $v\,dm/dt$, which is then negative, exceeds in absolute terms $m\,dv/dt$, which is then positive). It is also possible for them to have $dp/dt > 0$ at the end of a contraction (again if $v\,dm/dt$ is absolutely larger than $m\,dv/dt$, the signs of the two expressions being here + and −, respectively). In such cases the sign of dp/dt would be the same for the profitable companies as for the submarginal ones (for which it is uniquely determined under the adopted assumptions), so that there would be no lead of the profit experience of the submarginal firms relative to that of all others.

[24] Let profit margins undergo the same relative change in each period for successful and unsuccessful concerns, with $m > 0$ throughout for the former and with $m < 0$ throughout for the latter. We do not know how the relative changes would differ between the groups, so that this source of divergence is best eliminated. The assumption about

The hypothesis that profit margins lead the activity of the corresponding industries receives considerable support from the evidence of various data for manufacturing and railroads. The comparisons presented in the Simpson-Anderson paper are based on the quarterly profit margin data for manufacturing—all corporations and 200 large companies—and the FRB index of industrial production.[25] This record covers minor as well as major or specific turns, but it is scanty (twelve observations in six turning zones between 1948 and 1953). Moreover, it is rendered doubtful by the seasonal variation in the profit margin series, as the authors themselves note. Nevertheless, the result of these comparisons is probably broadly valid, in view of its consistency with the findings of Thor Hultgren who makes full use of the available estimates of profits and sales for major groups of manufacturing corporations, and adjusts them for seasonal variations. Hultgren's observations indicate that, among the timing comparisons between peaks and troughs in profit margins and like turns in sales, leads of profit margins were about twice as frequent as coincidences and nearly four times as frequent as lags.[26]

Yet for an adequate test of the theory that profit margins are an important determinant of business failures, more is needed than a demonstration that profit margins often lead the volume of production or sales. This follows directly from the critique of the Simpson-Anderson hypothesis. Conceivably the lead of unit profits relative to sales might be a characteristic of only the more prosperous and not the marginal firms. There is the possibility that sales of unsuccessful concerns undergo cyclical reversals of movement before sales of profitable businesses. Or it could

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the signs of m is made simply because it underlies the Simpson-Anderson argument. Let sales lag profit margins by the same intervals for both groups of firms. Suppose further (1) that the time-path of sales is smoother than that of profit margins. If now sales are either (2) small for either group or (3) large for the profitable and small for the submarginal group, then aggregate profits will tend to have the same timing for the two groups, coincident with the timing of margins.

If, on the other hand, sales either (4) vary more sharply than margins or (5) are relatively large for the submarginal group, then the losses of that group will lead the profits of the successful companies.

What is "large" and "small" in this connection cannot be defined more precisely here. If the smoothness of sales (1) is more pronounced, less "smallness" of sales (2 or 3) will be necessary to produce the coincident timing of sales and margins.

[25] The all-manufacturing profit figures are taken from the quarterly financial report prepared by the Federal Trade Commission and the Securities and Exchange Commission. Data for large corporations are compiled by the Federal Reserve Board.

[26] The FTC-SEC data cover twenty-two major industries. An over-all count of the timing observations for this set of data yields 37 leads of profit margins relative to sales, 19 coincidences, and 10 lags; on 35 occasions sales turned but margins did not. (See *Thirty-ninth Annual Report of the National Bureau of Economic Research*, May 1959, p. 48.)

Longer data in monthly form are available only for railroads. Here Hultgren found a tendency for profits per unit of traffic to lead the volume of traffic (see his *American Transportation in Prosperity and Depression*, New York, NBER, 1948, pp. 311–315).

turn out that the lead of profit margins is not long or regular enough to warrant the conclusions drawn in the Simpson-Anderson study.

As will be shown in the next section of this paper, direct timing comparisons between corporate margins and total profits and liabilities of business failures (all seasonally adjusted quarterly series) do not reveal any systematic lead of profit margins relative to the other series and thus do not suggest a strategic causal role for the margins. In view of the various possibilities mentioned before, this result is not inconsistent with the finding that profit margins often lead business or industrial activity. Which of the possibilities applies cannot be positively ascertained in the absence of monthly or at least quarterly data on profits and sales of marginal, as distinguished from other, concerns. But in any event, profit margins for all corporations do not seem to move ahead of liabilities, that is of the larger failures, with any significant regularity. They lead activity, but probably by shorter intervals than do the liabilities, and perhaps also less systematically. However, they may be associated in a more important way with smaller failures which, as noted earlier, tend to turn later than the failures of larger companies.

EFFECT OF LEGAL FORM AND ACCOUNTING PRACTICES OF FIRMS ON TIMING OF FAILURES

Actually the Simpson-Anderson hypothesis about profit margins does not attempt to explain the timing differences between liabilities and numbers, that is between larger and smaller failures. To account for these differences the authors adopt an additional hypothesis, according to which the lead of larger failures is mostly attributable to "the greater concern of creditors for the fortunes of larger debtors and the fact that the larger failures are usually corporations, and their owners have limited liability. Thus creditors are likely to take action more quickly in the case of larger businesses encountering difficulties, and stockholders may be more willing to give up than direct proprietors."[27]

This is a plausible explanation. But the lead of larger failures may be the result of voluntary liquidations on the part of debtors, as well as of bankruptcy suits on the part of the creditors. Larger companies are sooner aware of the fact that they are losing money (or not making any) than smaller concerns, since the latter often use less elaborate accounting methods. Indeed, various surveys of commercial bankruptcies and failures show that large percentages of these businesses kept either no books at all or inadequate books, and there is some indication in these data that the groups in question include mainly smaller firms.[28] It is also true that

[27] Simpson and Anderson, "Liabilities of Business Failures," p. 193.

[28] Consider the following data from two surveys of business failures conducted for the Department of Commerce in the early thirties, bearing in mind that the size of firm

small proprietors, motivated by attachments and fears of various sorts, may often wish to resist or delay liquidation long after the precarious state of their business affairs becomes clear to them, and that they may be able to do so at the expense of adequate remuneration for their own work and/or capital. For all these reasons, one would presume that a decline in actual or expected profits would have a prompter effect upon the larger concerns in trouble than upon the smaller ones, so that the former will tend to give up sooner.[29]

Business Failures and Profits

What changes in what indicators would prompt creditors or debtors to accelerate failure proceedings involving companies of relatively large size well ahead of the recession in general business? What developments would make them delay such action at a time when business recovery is not yet immediately in sight? The arguments reviewed in the preceding section, while suggesting plausible explanations on some other points, do not seem to us to provide convincing answers to the above questions. But they do lead to a sharper formulation of these questions, which is helpful in any further dealing with the problem of the cyclical lead in failure liabilities.

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is typically larger in manufacturing and wholesale trade than in retail trade, construction, and the real estate business:

Industry	FAILURES IN N.J., 1929–30[a]			FAILURES IN MASS., 1930–31[b]		
		Per Cent of Firms That Kept			*Per Cent of Firms That Kept*	
	No.	No Records	Inadequate Records	No.	No Records	Inadequate Records
Manufacturing	21	10	14	53	22	28
Wholesale	13	0	15	52	27	38
Retail (merchandise)	262	21	32	215	52	31
Retail (services)				60	50	26
Construction	86	30	28	169	67	20
Real estate	20	50	25			
Total	402	23	30	549	51	28

[a] W. C. Plummer, *Causes of Business Failures and Bankruptcies of Individuals in New Jersey in 1929–30*, U.S. Department of Commerce, Domestic Commerce Series No. 54, 1931, p. 6.

[b] Victor Sadd and Robert T. Williams, *Causes of Commercial Bankruptcies*, U.S. Department of Commerce, Domestic Commerce Series No. 69, 1932, p. 17.

[29] The authors are informed that the hypothesis about the differential behavior of small and larger firms experiencing declining profits was suggested some time ago by Dr. Ralph J. Watkins, then of Dun and Bradstreet, Inc., in private conversations.

TIMING OF TURNS IN TOTAL PROFITS AND MARGINS COMPARED TO TURNS IN FAILURE LIABILITIES

There is good reason to expect the indicators of these developments to be closely related to profits, since lack of profits or insupportable losses are without doubt the principal immediate cause of business failures. However, it is doubtful that the main role is played by the *over-all profit totals or margins.* The timing of cyclical turns in these aggregative profit variables does not seem early enough to signal reversals in the volume of failures as measured by liabilities or the number of large failures.

Chart 12.3 presents the evidence, which regrettably covers only the short period 1947–58 and is subject to still other limitations (restriction of the profit series to the corporate sector, quarterly rather than monthly data). The graphs certainly indicate an association between the *cyclical* movements in failure liabilities and profit totals as well as margins.[30] However, the evidence on the nature of the typical timing relations between these variables is not conclusive. Midway in the contraction of 1949, liabilities of commercial and industrial failures (inverted and expressed in quarterly form for comparability) turned up together with the profit totals and margins of the FTC-SEC compilation and ahead of the profit aggregates of the Department of Commerce. In winter 1953–54, before the next recovery in general business, the inverted liability series began to increase in the same quarter with the profit variables. It also seems to have lagged in 1950, although on this occasion liabilities flattened off decidedly two quarters before they turned down, that is at about the time when profit totals and margins dropped. But then again liabilities clearly anticipated the last downturn in the profit series marked in Chart 12.3 (1955), even if allowance is made for the difference in trend. In brief, while the major turns in the inverted liability series match those in the profit series, no marked leading or lagging tendencies are discernible.[31]

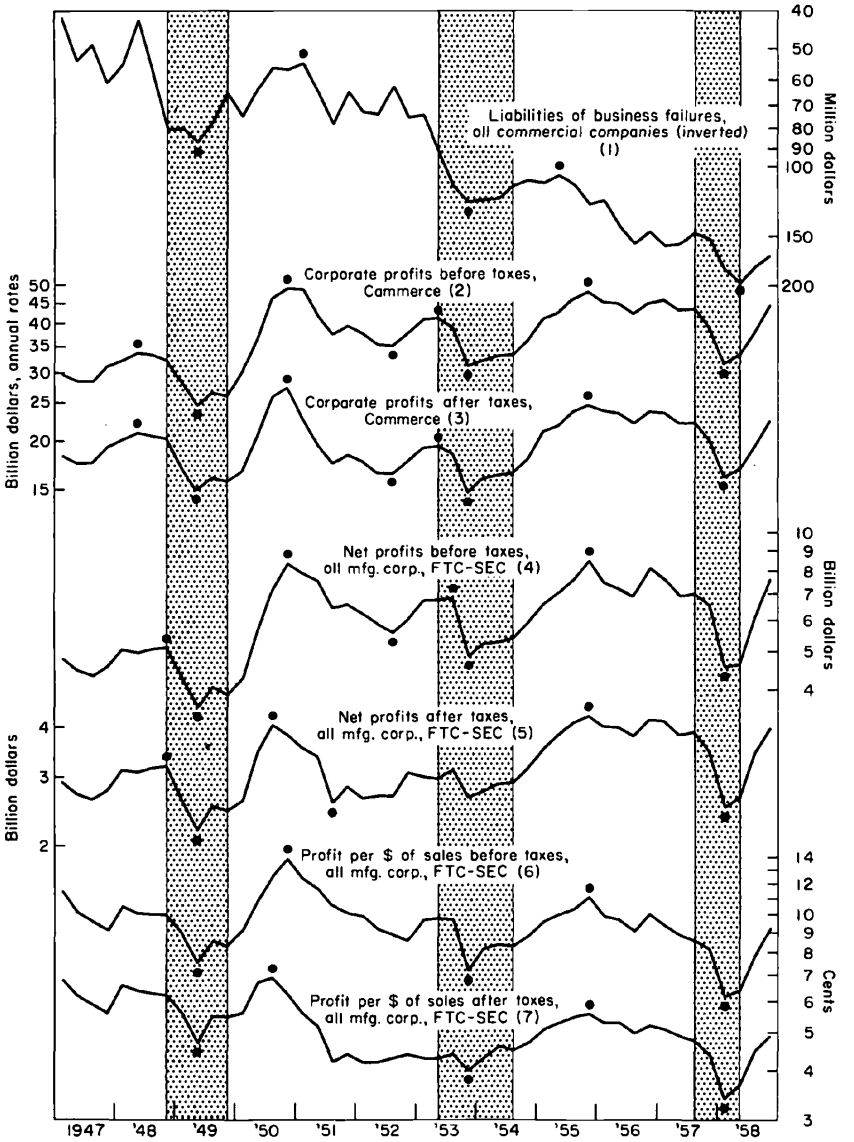
Moreover, in the period reviewed profit margins have not, according to Chart 12.3, led profits proper in any systematic way (a rather serious objection to the profit margin hypothesis as summarized earlier). The decade beginning in 1947 witnessed only one episode in which profits per dollar of sales led total profits (both before and after taxes). This

[30] The chart conceals in part the closeness of this association because parallel cyclical movements in liabilities and profits are overlaid by divergent trends. The inverted liability series has a pronounced downward trend, the profit variables have either a slight upward inclination or no clear bent in either direction.

[31] It may be noted that adding comparisons between minor turning points would not essentially change the picture. The inverted liability series shows a subphase between the third quarters of 1951 and 1952, and this rise seems to match the increases in some of the profit series which occurred later in 1952–53. Chart 12.3 also shows that the high point in the inverted liabilities in the second quarter of 1948 preceded the specific peaks in the aggregate profit series, although not the local peaks in profit margins (which fall in the first quarter of the year).

CHART 12.3

Liabilities of Business Failures Compared with Selected Profit Data, 1947–58



Shaded areas represent business contractions; unshaded areas, expansions.
Data are seasonally adjusted.
Dots identify peaks and troughs of specific cycles.
SOURCE: (1) Dun and Bradstreet, Inc.
(2) and (3) U.S. Department of Commerce.
(4)–(7) Federal Trade Commission and Securities and Exchange Commission.

was in 1948, although the exact date of the specific peak in profit margins cannot be ascertained. At other major turns that can be matched during this period, the timing of totals and margins was exactly coincident on a quarterly basis.

RELATION BETWEEN DIFFUSION OF PROFITS AND BUSINESS FAILURES

It is possible that fluctuations in the cyclically sensitive component of business failures, represented in the series on liabilities, owe their early timing not so much to leads of total profits or even of total profit-sales ratios, but rather to the lead in the *diffusion* of profits (both of profit totals and margins). As is well known, diffusion indexes have a strong tendency to lead the series from which they are built and the corresponding aggregates. Thus Thor Hultgren, using quarterly data for 1920–38, found that the proportion, within a sample of corporations, of companies with rising profits begins to decline before the end of the expansion in the aggregate profits of the whole group.[32] While this situation typifies the late stage of a business expansion, its opposite—a rising percentage of companies with expanding profits when aggregate profits are still declining—prevails during the advanced stages of a business contraction. By the logic of the role of profits in a business economy, these early changes in the dispersion of cyclical movements in profits should be a vital element in the workings of the business cycle.[33]

Among the various possible implications of such changes, the link to business failures is a plausible one. There are good reasons to expect changes in the volume of failures to be clearly associated with changes in the *scope* of profit movements (as distinguished from the *level* of aggregate profits).

Even under poor business conditions the probability of failure is nil or small for a very large majority of the business population; it would take an unusually drastic deterioration of the economic situation to reduce this majority materially. In practice, most of the established firms can meet their recurrent financial obligations. They can withstand occasional short-run losses without getting involved in voluntary or involuntary proceedings which will result in losses to creditors. Nevertheless, the chance that any business will fail is, as a rule, an inverse function of the firm's profitability. There is a wide variation in profitability among companies at any stage of the cycle. There is also a wide dispersion of changes in the concerns'

[32] Thor Hultgren, *Cyclical Diversities in the Fortunes of Industrial Corporations*, reprinted here, Chapter 11.

[33] Early declines in the profits of some companies may reflect the inability of these concerns to offset rising costs by raising prices, or they may be due to early declines in the companies' sales. The two factors may be at work simultaneously in various combinations. Early rises in the profits of certain companies can be explained analogously. (See *ibid.*) But whatever their *causes*, the *consequences* of such developments will certainly be important.

actual fortunes. Enterprises of the same size, industry, and location may have similar profit-and-loss experiences. Also, there is possibly a substantial measure of stability in the composition of groups of companies with parallel profit developments. But among such groups the diversification is large. The likelihood for any firm to fail will increase, not so much when aggregate profits in the economy as a whole decrease, but rather when there is a drop in the average profit level of the group or sector to which that business belongs.

This suggests the significance of comprehensive or representative measures of profit diffusion as an explanation of the early changes in business failures. When the percentage of concerns with decreasing profits or increasing losses begins to rise (i.e. the diffusion index of profits turns down), this indicates that conditions are becoming less favorable for business solvency in more sectors of the economy. Under such conditions business failures are likely to increase, even though in the economy as a whole the level of total profits, or even of profit margins, is still rising. An analogous argument is applicable to a decrease in failures coming in the wake of an upturn in the diffusion of profits.[34]

[34] Suppose that there are n firms in the economy, r of which at any given time have rising profits, so that the diffusion index of profits is $\frac{r}{n}$ 100. Let P and P_i be total profits of all firms and profits of the i^{th} firm, respectively ($i = 1, 2 \ldots n$). Let F denote the total number of failures and F_i the probability of failure of the i^{th} firm. Assume $F_i = f(P_i)$, $\frac{dF_i}{dP_i} \leq 0$.

The condition for P = max. may be written as

$$\frac{dP_1}{dt} + \frac{dP_2}{dt} \ldots + \frac{dP_r}{dt} = -\left\{\frac{dP_{r+1}}{dt} + \frac{dP_{r+2}}{dt} \ldots + \frac{dP_n}{dt}\right\}.$$

It appears plausible that in this situation the probability of failure for a firm with rising profits is already very low and will not be much reduced by a further profit increase. Thus we assume that, for $j \leq r$ and $k > r$,

$$\frac{dF_j}{dP_j} \text{ is small or zero, and } \left|\frac{dF_j}{dP_j}\right| < \left|\frac{dF_k}{dP_k}\right|.$$

It follows that at this point the expression

$$\frac{dP_1}{dt}\frac{dF_1}{dP_1} + \frac{dP_2}{dt}\frac{dF_2}{dP_2} \ldots + \frac{dP_r}{dt}\frac{dF_r}{dP_r} + \frac{dP_{r+1}}{dt}\frac{dF_{r+1}}{dP_{r+1}} \ldots + \frac{dP_n}{dt}\frac{dF_n}{dP_n}$$

will be positive, that is failures may be expected to be already rising at the time when total profits have reached their peak $\left(\text{when } \frac{dP}{dt} = 0, \frac{dF}{dt} > 0\right)$.

The position in which F = min. will have occurred some time earlier, and presumably (since profit diffusion leads total profits) at higher values of r and $\frac{r}{n}$. What this model shows, therefore, is that the over-all level of failures is an (inverse) function, not only of the changes in profits of individual firms, but also of the diffusion index of profits. The failure aggregate may lag behind the diffusion index. (It should be noted that the above

COMPARISON OF CYCLES IN FAILURES AND IN PROFITS: AGGREGATIVE MEASURES VS. DIFFUSION INDEXES

In Charts 12.4 and 12.5 covering the periods 1947–58 and 1920–38, respectively, liabilities of business failures (inverted) are seen to be in broad agreement with the diffusion indexes of profits in the direction of their cyclical movements. Failure liabilities tended to increase when the proportion of companies with declining profits or rising losses increased; they tended to decrease when more and more companies improved their profit position. But the peaks and troughs in the indexes of profit diffusion have as a rule preceded the corresponding turns in the inverted series on liabilities. This tendency of the percentage expanding series for profits to lead the dollar volume of failures was quite consistent and strong in the interwar period, less pronounced in the recent postwar years. Turning points in the diffusion of profit margins also preceded the cyclical reversals of failure liabilities in the 1947–58 period.

Our profit diffusion measures reflect primarily the experience of large concerns—corporations whose size dwarfs even the largest companies among those that fail. The index for the interwar period, shown in Chart 12.5, includes mostly manufacturing and mining companies of substantial size and some very large corporations. This index was constructed by Thor Hultgren mainly from materials compiled by the National City Bank of New York.[35] The first of the postwar indexes included in Chart 12.4 (line 2) is based on a new National City Bank sample consisting of a larger number of companies (about 400, or 341 on a continuous basis). Lines 3 and 4 in Chart 12.4 represent diffusion indexes computed from Federal Reserve Board data on profits of 200 large manufacturing corporations. Only one of the indexes in this chart (line 5) covers medium-size

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model does not *imply* this timing relation, only admits it as a possibility.) On the other hand, the same aggregate is likely to *lead* total profits, with which it is rather indirectly associated.

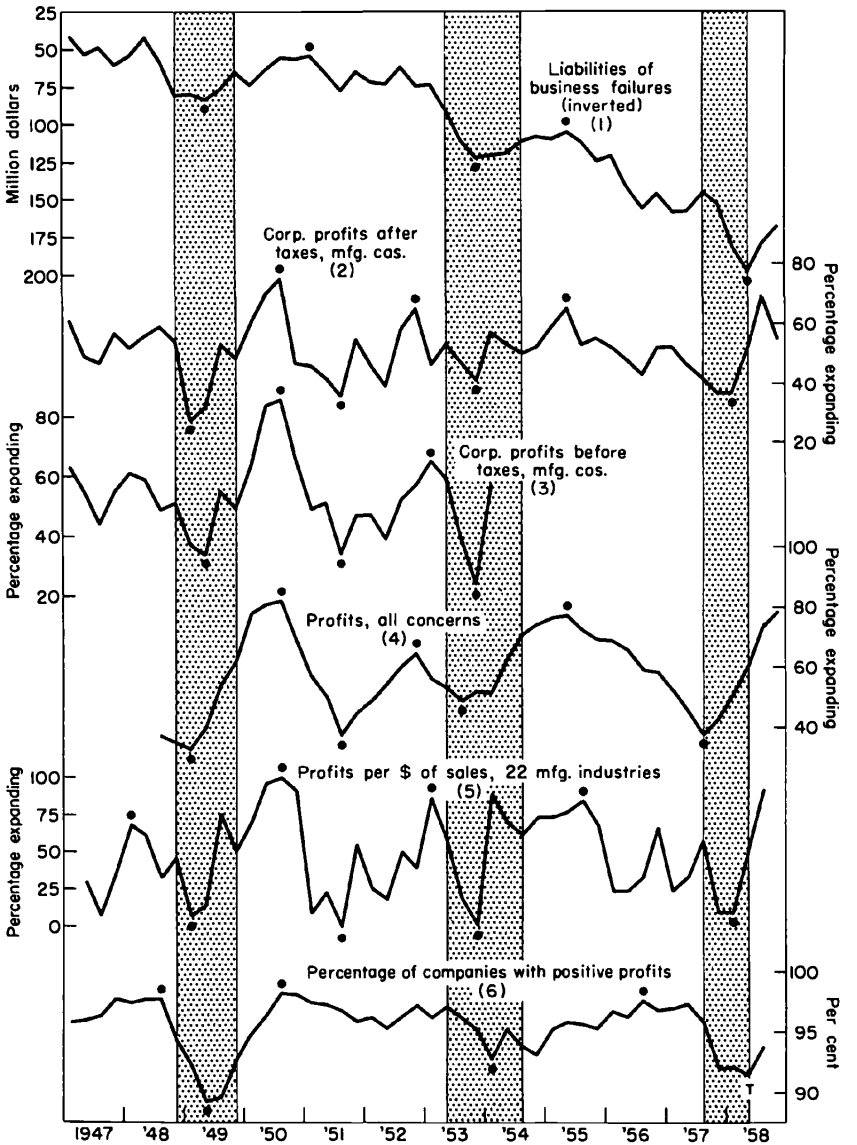
Examination of data shows that, for a better agreement with facts, the failure variables in this scheme should represent liabilities or the number of large failures rather than total numbers. It is a weakness of the above argument that it does not seem to make this qualification necessary.

The model could also be reinterpreted so as to make n the number, not of firms, but of certain *sectors* in the economy. Then r would be the number of sectors with rising profits, P_i would be profits and F_i failures of the i^{th} sector. The concerns comprising each sector would have to be chosen in such a way that the profits of all the individual firms in the sector rise or fall together. Otherwise, a sector could be so heterogeneous that within it dF_i need not always be nonpositive.

[35] The coverage of this index increased steadily from 17 companies in 1920–23 to over 100 after 1924 and 244 beginning in 1933. The assets of the corporations in these samples, in millions of dollars, averaged high in two-digit figures, but it should be noted that the samples include two giant corporations whose assets run into billions of dollars (General Motors and U.S. Steel). The National City Bank figures were used by Hultgren in conjunction with some additional data collected by Harold Barger, *Outlay and Income in the United States, 1921–38*, New York, NBER, 1942, Appendix B.

CHART 12.4

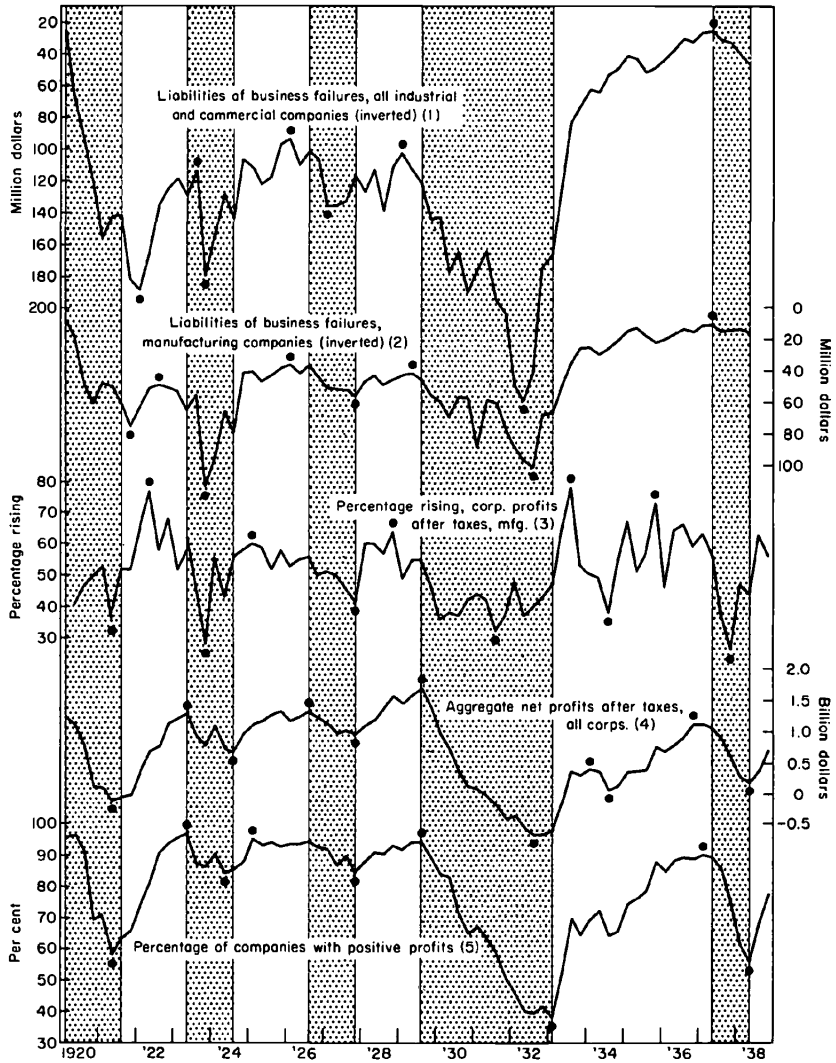
Liabilities of Business Failures Compared with Diffusion Indexes of Profits and Related Series, 1947–58



Shaded areas represent business contractions; unshaded areas, expansions.
Dots identify peaks and troughs of specific cycles; tentative turns are marked "T."
SOURCE: (1) and (4) Dun and Bradstreet, Inc.
(2) and (6) National City Bank.
(3) Federal Reserve Board.
(5) Federal Trade Commission and Securities and Exchange Commission.

CHART 12.5

Liabilities of Business Failures, Aggregate Profits and Percentage of Companies with Rising and with Positive Profits, 1920–38



Shaded areas represent business contractions; unshaded areas, expansions.
Dots identify peaks and troughs of specific cycles.

SOURCE: (1) and (2) Dun and Bradstreet, Inc.
(3) and (5) National City Bank.
(4) Barger, *Outlay and Income in the United States, 1921–38.*

as well as large companies. This series, based on survey data compiled by Dun and Bradstreet, Inc., measures the scope of expansions and contractions in profits of a relatively large sample of corporate and non-corporate enterprises in manufacturing and wholesale and retail trade.[36]

The cyclical movements in the diffusion index of *profit margins* (line 6) were by and large parallel to those in the diffusion indexes of total profits. The margin index shown in Chart 12.4 is based on FTC–SEC quarterly series on profits per dollar of sales, before taxes, for 22 manufacturing industries (all component series seasonally adjusted by the National Bureau).

Clearly the diffusion indexes available are not of the type one would prefer for comparisons with measures of business failures. In order to include in a balanced way firms at and below the margin of profitability, an index of profit diffusion would have to cover a large number and variety of concerns. In order to serve comparisons designed to bring out the expected association between profits and failures in particular sectors of the economy, another index still would be needed, based on a stratified sample covering adequately each of the properly chosen sectors. But with the information at our disposal it is not possible to determine to what extent increasing the coverage or changing the construction of the index would affect its cyclical timing.[37]

In any event, we must be content with such profit diffusion series as are available, and these definitely lead the liabilities of business failures. The relation can be explained along the lines of our earlier argument if the indexes used are assumed to approximate sufficiently well the more comprehensive and representative measures of the diffusion of profit movements among firms.

The series shown at the bottom of Charts 12.4 and 12.5 measure the percentages of companies in the National City Bank samples that registered positive profits in each successive quarter of the periods 1947–58 and 1920–38, respectively. Although derived in a similar way to a diffusion index, these series are actually very different from diffusion measures, since they show the percentage, not of companies with *rising* profits (or with declining losses), but of companies with any *positive* profits, whether

[36] Since 1952 the number reporting came to exceed 1,300 in several quarters and was regularly above 1,000. Nearly one-fourth of all concerns had an estimated tangible net worth of less than $125,000, and more than half of them were by the same measure worth less than $300,000. For a description of the Dun and Bradstreet Surveys, see *An Appraisal of Data and Research on Businessmen's Expectations about Outlook and Operating Variables*, Report of Consultant Committee on General Business Expectations Organized by the Federal Reserve Board, September 1955, pp. 25–33.

[37] There is, however, some indication in our data that the inclusion of intermediate-size companies along with the large corporations causes little shift in timing. The quarterly turning dates in the Dun and Bradstreet series are either exactly or very nearly coincident with the corresponding turns in the other diffusion indexes of profits.

rising or falling. Hence it is not surprising that these series behave much more like *total* profits than like indexes of change of profit diffusion.[38]

For a more systematic measurement of the relations described, tables of timing comparisons must be used to supplement a close inspection of the charts. Timing at individual turning points is occasionally uncertain, as can be seen from the charts (cf. the discussion of Chart 12.3). Nevertheless, the observations based on graphs of seasonally adjusted data should be put in the form of numerical estimates to complete the comparative analysis and to permit a summary of the results.

Table 12.3 uses as reference chronology the four turns in failure liabilities during the decade 1947–56 and shows the timing at each of these dates of the several profit variables plotted in Charts 12.3 and 12.4. The measures confirm the lack of consistency in the timing of total profits and profit margins with respect to failure liabilities. Troughs in these quarterly series coincided in 1949 and 1953; in 1958 profit totals and margins led liabilities by one quarter. At peaks, the profit series led liabilities by one quarter in 1951 and lagged by two quarters in 1955 (cols. 6–9). The timing, relative to liabilities, of the percentage of companies with positive profits (col. 5) was, on balance, more sluggish than the timing of total profits. Among the comparisons between liabilities and the diffusion indexes of profits, on the other hand, leads of the indexes, ranging from one to three quarters, prevail over coincidences and there are no lags (cols. 1–3). The timing of the diffusion index of profit margins was similar to that of the diffusion indexes of total profits, not systematically earlier (cf. col. 4 with cols. 1–3).

Hence the short postwar record for the diffusion indexes offers some indication of a tendency for these series to lead the dollar volume of failures, whereas the parallel comparisons for profit totals and margins convey the impression of a mixed timing rather than of any regular tendency to lead or lag. But evidence is meager, and little more can be said about it, without much hesitation, than that it is not inconsistent with the profit diffusion hypothesis set forth above.[39]

Data for the 1920's and the 1930's provide additional and stronger evidence that cyclical downturns in the percentages of companies with rising profits foreshadow troughs in failure liabilities (Table 12.4). Most

[38] Compare line 6 in Chart 12.4 with the profit series in Chart 12.3. Also compare lines 4 and 5 in Chart 12.5.

[39] When failures other than in manufacturing (and mining) are excluded, the timing of the liability series seems to be earlier on two occasions. The first trough falls in the fourth quarter of 1948 rather than in the second quarter of 1949, though the timing here is not very certain. The last peak date is the fourth quarter of 1954. The two turns in between are the same as for the total liability series (I 1951 and IV 1953, cf. Table 12.3). Hence the comparisons with liabilities of manufacturing failures yield more lags or longer lags, and fewer leads and coincidences, than are obtained when liabilities of all failures are used.

TABLE 12.3

Timing of Aggregates, Margins, and Diffusion Indexes of Profits, and of Some Related Series at Turns of Cycles in Liabilities of Business Failures, 1949–58

Type and Date of Turn, Liabilities of Business Failures, All Industrial and Commercial Companies (inverted)	LEAD (−) OR LAG (+) AT TURNS IN FAILURE LIABILITIES (IN QUARTERS)								
	Percentage of Firms with Rising Profits			Percentage of Industries with Rising Profit Margins Before Tax, FTC-SEC	Percentage of Firms with Positive Profits, Nat. City Bank	*Aggregate Profits*		*Profit per Dollar of Sales, Manufacturing Corps.*	
	Corporate Profits		All Concerns, Dun and Bradstreet			Corporate Profits, Commerce[b]	Net Profits Before Tax, Mfg. Corps., FTC-SEC[c]	Before Tax FTC-SEC	After Tax FTC-SEC
	After Tax, National City Bank (1)	Before Tax, Federal Reserve Board[a] (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Trough II 1949	−1	0	−1[d]	−2	0	0	0	0	0
Peak I 1951	−2	−2	−2	−2	−2	−1	−1	−1	−2
Trough IV 1953	0	0[d]	−1	0	+1	0	0	0	0
Peak II 1955	0	n.a.	0	−1	+5	+2	+2	+2	+2
Trough II 1958	−1	n.a.	−3	−1	0	−1	−1	−1	−1

SOURCES: Chart 12.4 (cols. 1–5) and Chart 12.3 (cols. 6–9).

[a] Corresponding timing measures for the after-tax series (FRB) are: 0, −2, and −1.[d]

[b] Measures in this column apply to Commerce series on profits before taxes as well as after taxes (the specific cycle turns in these two profit series coincide).

[c] Corresponding timing measures for the after-tax series (FTC-SEC) are: 0, −2, 0 (minor turn), +2, and −1 (cf. Chart 12.3, lines 4 and 5).

[d] Based on tentative trough dates in the respective diffusion indexes.

TABLE 12.4

Percentages of Corporations with Rising and with Positive Profits, and Aggregate Corporate Profits, Timing at Turns in Two Series on Failure Liabilities,[a] 1921–37

Type and Date of Turn, Liabilities of Business Failures			*Lead (−) or Lag (+) (in quarters)*		
			Percentage of Firms with Rising Profits After Taxes, Mfg. Cos. (1)	Percentage of Firms with Positive Profits Mfg., Mining, Trade & Service Cos. (2)	Net Profits of All Corps. After Taxes, (Barger) (3)
All Industrial and Commercial Companies					
Trough	I	1922	−5[b]	−3	−3
Peak	III	1923	−5	−1	−1
Trough	IV	1923	0	+2	+3
Peak	I	1926	−4	−4	+2
Trough	I	1927	+3	+3	+3
Peak	I	1929	−1	+2	+2
Trough	II	1932	−3	+3	+1
Peak	II	1937	−6	−1	−2
All Manufacturing Companies					
Trough	IV	1921	−4[b]	−2	−2
Peak	III	1922	−1	+3	+3
Trough	IV	1923	0	+2	+3
Peak	I	1926	−4	−4	+2
Trough	IV	1927	0	0	0
Peak	II	1929	−2	+1	+1
Trough	III	1932	−4	+2	0
Peak	II	1937	−6	−1	−2
AVERAGE LEAD (−) OR LAG (+) (IN BRACKETS: AVERAGE DEVIATION)					
All Industrial and Commercial Companies					
Peaks			−4.0(1.5)	−1.0(1.5)	+0.2(1.8)
Troughs			−1.2(2.8)	+1.2(2.1)	+1.0(2.0)
All Turns			−2.6(2.5)	+0.1(2.4)	+0.6(2.0)
All Manufacturing Companies					
Peaks			−3.2(1.8)	−0.2(2.2)	+1.0(1.5)
Troughs			−2.0(2.0)	+0.5(1.5)	+0.2(1.4)
All Turns			−2.6(1.9)	+0.1(1.9)	+0.6(1.6)

SOURCE: Chart 12.4.

[a] Inverted.

[b] Based on a tentative trough date in the percentage expanding series.

of these leads are at least as long as four quarters. The upturns in the percentage also precede the peaks in liabilities on most occasions, but here the intervals are on the whole shorter. By and large, leads of profit diffusion at turns in the dollar volume of business failures were considerably longer in the interwar than in recent years; the reason for this is not clear.

Taking the prewar and the postwar measures together and using the

National City Bank indexes of profit diffusion throughout, we find that these indexes led failure liabilities at nine out of thirteen turns, and lagged only once. This record leaves little doubt indeed about the systematic character of the lead in the diffusion series.

In contrast to the anticipatory timing of the diffusion index of profits, aggregate corporate profits lagged at most of the turning points in failure liabilities during the interwar period. Most of these lags are of two and three quarters, and they outweigh on the average the fewer leads of similar length, although not by a large margin (Table 12.4). The estimates of total corporate profits, 1920–38, are those compiled by Harold Barger; the quarterly series is shown and identified in Chart 12.5.

Table 12.4 also shows that peaks and troughs in the percentage of companies with positive profits, together with like turns in aggregate profits, tended to lag at troughs and peaks in failure liabilities, respectively (cf. cols. 2 and 3).

When the comparisons are made with liabilities of manufacturing rather than of all business failures (as one may wish to do for greater comparability), the results obtained are quite similar, at least for the over-all picture if not, of course, for all the detail. This too is shown in Table 12.4.

Again we cannot tell why the difference in timing between the aggregates and the diffusion indexes of profits should have been more pronounced in the 1920's and the 1930's than in recent years. Coverage differences could be partly responsible. The diffusion index for the interwar period shares the large-company bias of the postwar indexes compiled from the National City Bank and the FRB data. But Barger's series probably has more of the same bias than the current Commerce figures on total corporate profits.

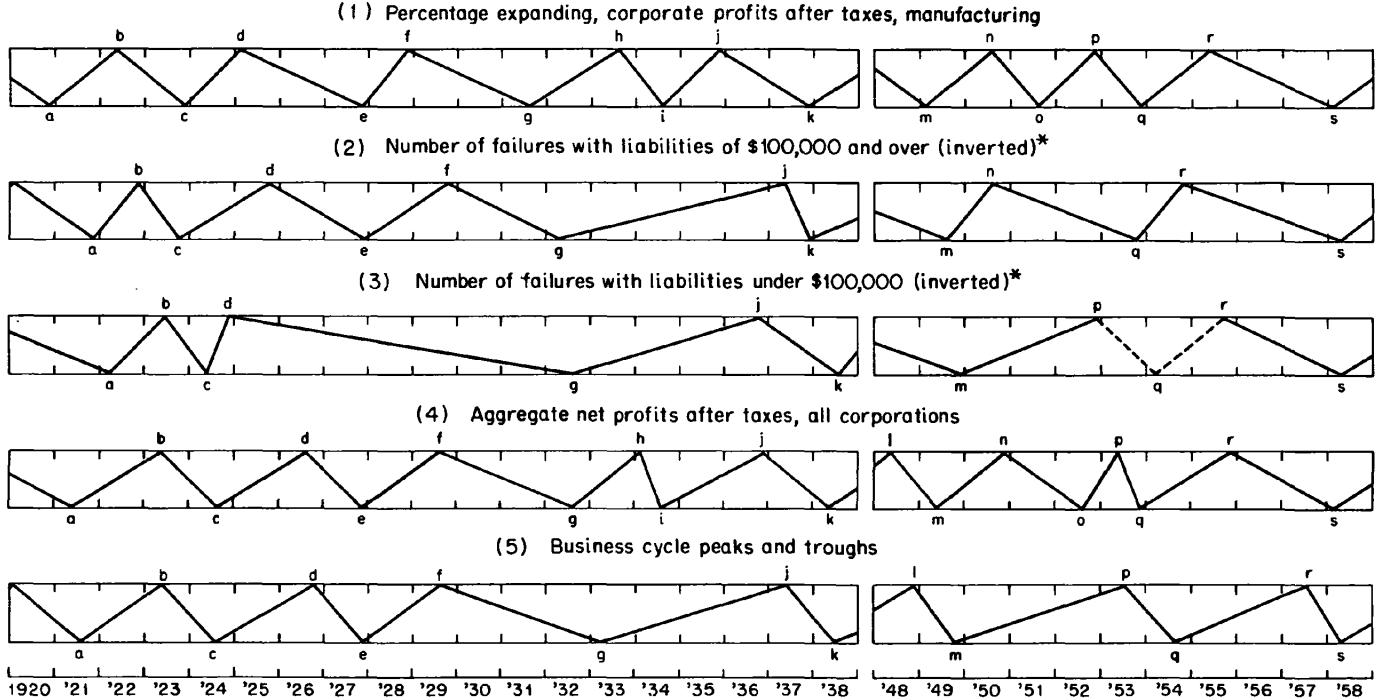
It would be highly desirable to compare the liabilities of failures in the interwar years with profit margins as well as the totals and the diffusion figures. This would add to the scanty evidence of recent data on the relationships among the above variables as indicators of business failures. But there is no usable quarterly series on profit margins to cover this earlier period.

Conclusions

The conditions in the latter part of a business expansion that lead to a decline in the number of companies with rising profits also appear to cause, with some lag, an increase in the number of failures of larger concerns and in the aggregate liabilities of all failures. This is followed by an increase in the number of smaller concerns failing and a decrease in the aggregate profits of all concerns at about the time business activity as a whole begins to decline. During the ensuing contraction the number of companies with rising profits declines for a time, but eventually begins

CHART 12.6

Timing of Cycles in Large and Small Failures Compared with Cycles in Profit Diffusion and Aggregate Profits, 1920–38, 1948–58



* 1920–38, manufacturing failures; 1948–58, all industrial and commercial failures.

Identical letters denote cycle turns that can be matched.

Broken line in diagram (4) indicates a retardation.

SOURCE: (1) National City Bank.
(2) and (3) Dun and Bradstreet, Inc.
(4) Barger (1920–38) and U.S. Department of Commerce (1948–58).
(5) National Bureau of Economic Research.

to rise. Under these more favorable conditions, the number of large failures and total failure liabilities diminish. Finally, there is a reversal in the rate at which smaller firms are going into bankruptcy, an upturn in aggregate profits, and a general increase in the volume of business activity.

The observed timing sequences are shown schematically in Chart 12.6 for the periods 1920–38 and 1948–58. They appear to reflect substantial regularities. Cyclical turns in profit diffusion tend to lead the turns in the number of large failures, or to be approximately synchronous with them. Turns in large failures tend to be followed by turns in the number of small failures, which tend to coincide roughly with turns in aggregate profits (the failure series being taken on an inverted basis). The diffusion indexes of profits and the large failures usually lead business revivals and recessions, while total profits and small failures are most often roughly coincident in their timing with the peaks and troughs of the business cycle. These sequences are not invariably preserved in each turning zone, and they are somewhat obscured by the lack of one-to-one correspondence between the cycles in the series compared. Nevertheless, they represent the typical pattern. Thus useful clues are obtained toward an explanation of the cyclical behavior of business failures.

To make further progress in the explanation, one would probably have to introduce explicitly the concept of critical loss levels—brinks of bankruptcy. What are these critical levels, or rather zones, in different industries and sectors, and when are they reached in the course of the business cycle? These seem to be the right questions, but to get the answers a large amount of data would have to be collected and analyzed. A promising approach would be to study the credit rating histories and other general indicators of the financial status of firms that have subsequently failed. A thoroughgoing explanation of the early fluctuations in business failures, tied in with a comprehensive analysis of cycles in diverse business fortunes, would no doubt represent an important contribution to business cycle theory.