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the erratic month-to-month changes that many of these series exhibit, it is especially desirable to study all the evidence rather than rely on data for a single month or a single series. The average ranks for all ten leading indicators provide one means for doing this (Table 275), though of course the individual series and their relations to one another and to other series should be studied as well. As a group, the leaders provide a more reliable indication of severity than the aggregates during the first six or possibly nine months of recession.¹⁰

4. CHANGES IN THE SCOPE OF BUSINESS CYCLE CONTRACTIONS

The measures provided in Appendix A can help, also, to show how widespread the economic contraction is and whether it is spreading further. Table 278 shows how this may be done, using ten indicators of aggregate economic activity and ten leading indicators. The left-hand section of the table indicates, for successive months after the business cycle peak, what proportion of the series were above their level at the cycle peak (that is, a three-month average centered on the peak date). Very few of the aggregates (section A) reached such a favorable position during the first twelve months of the several recessions, although in the milder recessions one or two of the aggregates could be counted in this group in nearly every month. In 1953-54 eighteen months elapsed before half the aggregates regained the levels they had attained at the business cycle peak, and in 1948-49 it took seventeen months to reach a similar position. In the more severe contractions none of the aggregates got back to the peak level in that length of time. Among leading indicators (section B), five of the ten were above the July 1953 peak levels within ten months, or three months before the business upturn in August 1954. In the 1948-49 contraction five of the ten leaders had exceeded the peak level after thirteen months, or two months after the business upturn began. In 1920, 1937, and 1929 none had regained the peak level even after a full year of contraction. In Chart 290 the solid curves depict these developments during the first 24 months of each contraction.

Even though an indicator has not risen sufficiently to exceed the level attained when business activity was at its zenith, it may nevertheless have begun to rise. It is vital to watch for these initial upward movements. The right-hand section of Table 278 (and the dotted curves in Chart 290) shows what propor-

¹⁰ This implies that the leaders indicate the *subsequent* ranking of the aggregates. The following set of rank correlation coefficients, based on the ranks of the average ranks in Table 275, supports that inference, as well as the observation that the ranks of the leaders stabilize at an earlier date:

	Months after Peak		
	3	6	9
Leaders in specified month vs.			
Aggregates 3 mos. later	.88	.95	.99
Aggregates 6 mos. later	.70	.86	—
Leaders 3 mos. later	.85	.88	.76
Aggregates in specified month vs.			
Aggregates 3 mos. later	.29	.59	.83
Aggregates 6 mos. later	-.14	.39	—

TABLE 278
MEASURES OF THE CHANGING SCOPE OF BUSINESS CYCLE CONTRACTIONS

A. TEN INDICATORS OF AGGREGATE ECONOMIC ACTIVITY

Months after Peak	Per Cent Exceeding Level Reached at Business Cycle Peak ^a of										Per Cent Exceeding Level Reached in Third Preceding Month ^b					
	July 1957 ^c	Oct. 1926 ^d	July 1953	Nov. 1948	May 1923 ^d	Jan. 1920 ^e	May 1937	Aug. 1929	July 1957 ^c	Oct. 1926 ^d	July 1953	Nov. 1948	May 1923 ^d	Jan. 1920 ^e	May 1937	Aug. 1929
1	65	44	20	20	50	42	40	20	80	56	50	40	75	100 ^f	60	55
2	20	31	10	0	25	83	75	20	30	31	30	0	44	100 ^f	55	20
3	20	44	10	0	25	50	50	10	20	31	0	0	25	25	50	5
4	10	31	0	0	12	50	40	0	0	38	10	0	12	58	25	0
5	10	56	10	10	25	67	10	0	0	56	5	20	38	42	0	10
6	10	25	10	0	12	50	0	0	30	31	5	20	38	75	0	0
7	10	25	0	0	25	67	0	0	0	19	5	10	56	50	0	0
8	10	44	0	0	38	50	0	0	0	25	10	10	100	17	0	10
9		50	0	0	25	17	0	0	0	50	45	50	75	8	0	0
10		38	10	0*	12	8	0	0	0	56	65	35*	25	0	0	0
11		31	0	0	12	17	0	0	0	65	40	0	0	17	0	0
12		44*	10*	0	12	17	0*	0	0	38*	50*	70	6	0	20*	5
13		44	15	20	0*	8	0	0	0	44	50	100	6*	8	65	5
14		44	20	30	19	8	0	0	0	44	60	80	38	0	90	0
15		44	40	40	12	0	0	0	0	69	100	100	69	25	100	0
16		38	40	50	25	0	0	0	0	75	100	100	88	25	90	0
17		38	50	60	50	0*	0	0	0	69	100	100	100	25*	90	0
18		44	50	60	50	0	0	0	0	88	100	90	94	42	90	5
19		56	60	70	44	0	0	0	0	69	80	100	100	50	80	35
20		50	60	80	50	0	0	0	0	62	100	100	81	83	45	10
21		56	70	80	50	0	0	0	0	82	90	100	88	75	55	5
22		75	80	80	50	0	0	0	0	88	95	90	56	83	60	0
23		69	80	80	50	0	0	0	0	88	100	75	38	42	70	0
24																

* Business cycle trough was reached in this month.

^a Three-month average, centered on the peak month.

^b The third month after the peak is compared with the peak month, the fourth month after the peak is compared with the first month after the peak, etc. The results are entered in the terminal month of each comparison.

^c Data for corporate profits for IV 1957 and I 1958 and for GNP for I 1958 are not yet available (March 1958). It is assumed that both series have declined since the peak quarter (III 1957).

^d Based on 8 out of 10 series; nonagricultural employment and unemployment rate not available.

^e Based on 6 out of 10 series; nonagricultural employment, unemployment rate, GNP, and personal income not available.

^f Based on 5 series; corporate profits after taxes start in the first quarter of 1920.

E. TEN LEADING INDICATORS

Months after Peak	Per Cent Exceeding Level Reached at Business Cycle Peak ^a of										Per Cent Exceeding Level Reached in Third Preceding Month ^b					
	July 1957	Oct. 1926	July 1953	Nov. 1948	May 1923	Jan. 1920*	May 1937	Aug. 1929	July 1957	Oct. 1926	July 1953	Nov. 1948	May 1923	Jan. 1920*	May 1937	Aug. 1929
	1	40	30	30	20	30	44	10	20	60	30	10	10	25	38 ^h	20
2	20	20	10	10	15	22	20	20	30	20	30	-20	10	25 ^a	20	20
3	20	10	40	0	10	33	20	10	10	30	20	0	30	44	30	0
4	0	20	30	0	20	11	10	10	0	30	40	30	25	11	10	10
5	10	50	40	0	20	11	0	0	10	80	30	25	40	22	0	0
6	0	30	40	20	10	11	0	0	30	50	35	40	50	11	0	40
7	0	20	30	10	30	11	0	0	45	70	55	45	80	11	0	20
8	0	20	40	20	40	0	0	0	38	25	60	60	70	11	20	40
9		10	40	20	50	0	0	0		35	70	80	70	11	30	30
10		20	50	40	20	0	0	0		40	60	90	20	0	50	20
11		30	50	40*	10	0	0	0		40	90	95*	0	0	40	20
12		30	50	40	20	0	0	0		75	80	70	0	11	50	10
13		50*	40*	50	20	0	0*	0		80*	80*	65	10	22	40*	30
14		50	40	50	30*	0	20	0		70	80	80	30*	56	90	20
15		50	60	60	20	0	20	0		90	75	80	50	67	90	30
16		60	40	80	20	0	10	0		60	70	80	70	78	90	10
17		40	60	80	30	0	20	0		40	90	80	90	44	80	20
18		60	60	90	40	0*	20	0		60	90	90	90	33*	90	60
19		60	70	80	50	11	20	0		60	95	100	100	78	75	75
20		60	65	90	50	11	20	0		90	70	80	70	89	55	70
21		70	65	100	50	22	20	0		55	60	80	70	78	50	35
22		60	90	90	50	22	10	0		50	55	80	50	78	75	20
23		40	70	100	50	11	10	0		50	65	70	20	44	10	10
24		65	75	100	50	11	0	0		50	75	20	40	67	30	10

^a Based on 9 out of 10 series; average workweek not available.

^b Based on 8 series; new orders of durable goods start January 1920.

The seven business contractions before 1957 are arrayed from left to right in order of their severity. Series that are unchanged from peak level, or from third preceding month, are counted one-half in determining the per cent exceeding peak level or third preceding month. The series included are listed in Tables 266 and 273; in addition, the unemployment rate is included with the ten indicators of aggregate economic activity. A rise in the unemployment rate, layoff rate, or business failures is counted as a decline, and vice versa.

tion of the indicators began to register recovery in that sense as the contractions proceeded. It compares the current monthly figure with the figure three months earlier.¹¹ We find that in the 1953-54 and 1948-49 episodes substantial proportions of the ten aggregates were rising by the tenth month after the business recessions began (i.e., several months before the end of the contractions). But in 1937-38 and 1929-30 none of the aggregates were rising at this stage, even though in 1937-38 the end of the contraction came in the thirteenth month (June 1938). The recoveries in the leading indicators took place earlier and were more widespread. Even in 1937-38, half of the leaders had registered increases from the three-month-ago level by the tenth month, March 1938, thus heralding the end of that recession.

A sustained narrowing of the scope of the contraction is a signal that it is about to end. For example, the 1937-38, 1948-49, and 1953-54 contractions ended about a year after they began. The evidences of sustained recovery became apparent at an earlier date in the milder 1948-49 and 1953-54 episodes than in the sharp 1937-38 contraction. In each case, however, the narrowing of the scope of the contraction occurred earlier in the leaders than in the aggregates. At times, as in 1923-24, a narrowing of the scope of contraction may be followed by a further widening before recovery finally gets under way.¹²

The measures provided in Table 278, especially those showing the proportion of indicators that have exceeded their levels at the peak, suggest that if a period of depressed activity is defined as the interval from the peak to the date when activity regains the peak level, this period may be more closely related to the severity or magnitude of the decline from peak to trough than the duration of the decline itself is. Of course, different indicators of aggregate economic activity regain their previous peak levels at different dates. If we take as one criterion the date when half of our ten indicators of aggregate activity regained their level of the preceding business cycle peak, and as an alternative estimate the date when the industrial production index did so, we obtain the results shown in Table 281.

Not only are the periods of depressed activity substantially longer, as would be expected, than the contraction durations; they are also more closely related to the severity of the contractions. It took approximately a year and a half for the economy to recover, in the sense defined above, from the four mild or moderate contractions of 1926, 1953, 1948, and 1923; two and a half to three years to recover from the sharp contractions of 1920 and 1937; and at least seven years to recover from the 1929 contraction.

Another way to look at these results is as follows. Except in the Great Depression about a year or year and a half elapsed before the economy generated an upturn in business activity, whether the contraction was severe or moderate. But after the upturn the recovery to the previous peak was attained

¹¹ The choice of this interval involved a reconciliation of two conflicting considerations. A shorter interval would reflect a cyclical upturn more promptly, but would also reflect erratic movements more frequently. A longer interval would have the opposite advantage and disadvantage. The interval could well be different for different series. (A criterion for selecting an appropriate interval is developed by Julius Shiskin in *Electronic Computers and Business Indicators*, National Bureau of Economic Research, Occasional Paper 57, 1957.)

¹² For an analysis of the timing of changes in the scope of business cycle expansions and contractions and the relation of scope to severity, see the references cited in note 5 and also Geoffrey H. Moore, "The Diffusion of Business Cycles," in *Economics and the Public Interest*, Robert A. Solo, editor (Rutgers University Press, 1955), pp. 35-64.

in a much shorter time after the moderate contractions than after the severe ones. These recoveries were accomplished in 7, 5, 6, and 4 months after the upturn in the 1926, 1953, 1948 and 1923 contractions, respectively (col. 6 minus col. 3, Table 281). Recovery took roughly three times as long, 17 and 18 months, after the upturns in the 1920 and 1937 contractions, and nearly four years in the Great Depression. Although recoveries from severe contractions have usually taken place at a more rapid rate than from moderate contractions (that is, the percentage rate of growth per month is higher), the difference has

TABLE 281
DURATIONS OF BUSINESS CONTRACTIONS AND PERIODS OF
DEPRESSED ACTIVITY

Business Cycle Peak Date (1)	Business Cycle Trough Date (2)	Duration of Contraction, Months from (1) to (2) (3)	Date when Peak Level Was Regained ^a		Period of Depressed Activity		Percentage Decline in Industrial Production from Busi- ness Cycle Peak to Trough (8)
			Estimate A (4)	Estimate B (5)	Estimate A [months from (1) to (4)] (6)	Estimate B [months from (1) to (5)] (7)	
Oct. 1926	Nov. 1927	13	June 1928 ^b	June 1928 ^c	20	20	- 5.7
July 1953	Aug. 1954	13	Jan. 1955	May 1955	18	22	- 9.5
Nov. 1948	Oct. 1949	11	Apr. 1950	Apr. 1950	17	17	- 7.7
May 1923	July 1924	14	Nov. 1924 ^d	July 1925	18	26	-16.3
Jan. 1920	July 1921	18	Dec. 1922	Oct. 1922	35	33	-29.0
May 1937	June 1938	13	Dec. 1939	Oct. 1939	31	29	-31.5
Aug. 1929	Mar. 1933	43	e	Nov. 1936	e	87	-50.1

^a Estimate A is the date when at least half of the following indicators of aggregate economic activity had regained their respective levels at the business cycle peak date: nonagricultural employment, unemployment rate, gross national product, industrial production, freight carloadings, bank debits, personal income, retail sales, corporate profits, wholesale price index. Not all indicators were available for every date. Estimate B is the date when the industrial production index regained the level it had reached at the business cycle peak (three-month average centered on the peak).

^b Half the indicators were above their peak levels temporarily in March and August 1927, or five and ten months after the peak, respectively, but before the trough was reached.

^c The production index attained the peak level temporarily in March 1927, five months after the peak but before the trough was reached.

^d Half the indicators were above their peak levels temporarily in February 1924, nine months after the peak but before the trough was reached.

^e Industrial production was the only one of the ten indicators that exceeded its level as of the August 1929 peak before the next business cycle peak of May 1937.

not been sufficient to compensate fully for the greater depth of the severe contractions. Hence the recoveries take longer.¹³

All this suggests that our measures of the percentage declines in various indicators in the early stages of contraction may indicate, though only in a very rough way, the duration of "depression" as well as the severity of contraction. No great precision can be expected, however. The course of a contraction and the subsequent recovery is not foreordained. Both can be and have been influenced by deliberate actions taken to shorten the contraction and hasten

¹³ This implies a greater degree of uniformity in rates of cyclical expansion than in rates of contraction. For some observations on this point see my introduction to Daniel Creamer's *Personal Income during Business Cycles* (National Bureau of Economic Research, 1956), pp. xxiii-xxviii, and the National Bureau's *Thirty-seventh Annual Report*, May 1957, p. 52.

recovery, as well as by events and policies that originate elsewhere. Historical patterns and relationships ought not to be transplanted mechanically. They can and should be used to help us formulate realistic appraisals of existing situations.

5. OTHER APPLICATIONS

So far, attention has been on the use of the measures provided in this report to indicate the severity of recessions and to judge the prospects of recovery. Another use may be mentioned briefly. By applying the measures to a wide variety of economic data one can determine some of the distinctive characteristics of each recession—what sectors or aspects of economic activity are strong and what are weak. For example, in both the 1953–54 and 1948–49 recessions residential building displayed great strength; in 1937–38 and 1929–30, notable weakness. These differences are sharply etched in the percentage changes in the volume of contracts (Appendix A). Six months after recession began, residential contract volume (seasonally adjusted) had dropped 40 per cent in 1929 and 21 per cent in 1937, but had risen 3 per cent in 1948–49 and 10 per cent in 1953–54. Consumer instalment credit advanced vigorously in 1948–49 (it was 28 per cent higher a year after the recession began), rose moderately in 1953–54 (4 per cent higher), but declined appreciably in 1929–30 (9 per cent lower), and 1937–38 (6 per cent lower). Such differentiation of the strong and weak sectors in the economy during a recession is essential to appropriate diagnosis and prescription of policies to encourage revival.

For this purpose, too, the type of measure presented here may well be extended to other data of strategic interest from a policy standpoint. Data on comparative changes in personal and corporate income tax payments, in unemployment benefits, in federal and in state and local expenditures, in public works contracts, in interest rates, in the money supply, and in Federal Reserve operations would enable one to appraise the strength and timing of either deliberate or “built-in” stabilization policies. The simple technique illustrated in this report can thus be adapted to provide an up-to-date, objective set of facts on which to judge not only the severity, scope, and unique character of a developing recession, but also the prospects for an early recovery and the vigor with which steps are being taken to bring recovery about.

In order to facilitate the application of this analysis an electronic computer program has been prepared for the IBM 704 which computes the percentage changes from peak month to the first, second, third and up to the twenty-fourth month after peak, for any given series and for any given list of peak dates. The program also makes a similar set of computations of percentage changes from trough months, so that it can be used to compare cyclical revivals as well as recessions. In addition, the total percentage change from peak to trough and trough to peak is computed, to provide a measure of the full amplitude of cyclical swings. Appendix A is, in fact, a photocopy of the print-out provided by the program (total peak to trough changes are omitted for lack of space).

6. 1957–1958 RECESSION

How does the current contraction in business activity compare with earlier contractions when measured by the methods described above? As already noted,