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5. *Merchandise Ownership, Department Stores*

A moment's thought about the function of stocks and purchasing, in the framework of Chapter 2, impresses one with the importance of this whole constellation of management problems in a retail store. The vast number of articles that are bought, their high degree of specificity and the consequent need to foresee exactly what articles customers will want, the difficulty of disposing of customers' rejects, the necessarily large stocks that must in any event be carried—these and many other characteristics of the business make it clear that good purchasing and good stock management are prerequisite to good profits for a department store. Moreover, it seems evident that the specifics of good purchasing and stock management, their costs and opportunity costs, *could* be quite different in connection with the merchandise stocks of department stores on the one hand and the materials stocks of durable goods manufacturers on the other hand. Accordingly, it is important to examine the empirical evidence with an eye cocked at both possible similarities and differences in the two types of enterprises. The differences particularly may be helpful in salting the slippery tail of causation when, in Chapter 9, we try to examine it.

"Merchandising data" reported by department stores to the Federal Reserve System include information on outstanding orders as well as on stocks. The totals, which we have called ownership, are sometimes referred to by retailers as "in-sights," [1] and it is not, incidentally, without interest that retailers have a word for it.

THE LEVEL OF OWNERSHIP

Total ownership averaged four months' supply during the thirteen years from 1949 to 1961. And it is interesting, though I can attach no specific significance to it, that this seems to be about the same figure as for the materials of durable goods manufacturers. However, the distribution between stocks on hand and on order was very different for the two types of enterprises. For department stores, stocks constituted about 70 per cent and outstanding orders 30 per cent of total pipeline goods "in-sight."

CONFORMITY AND TIMING

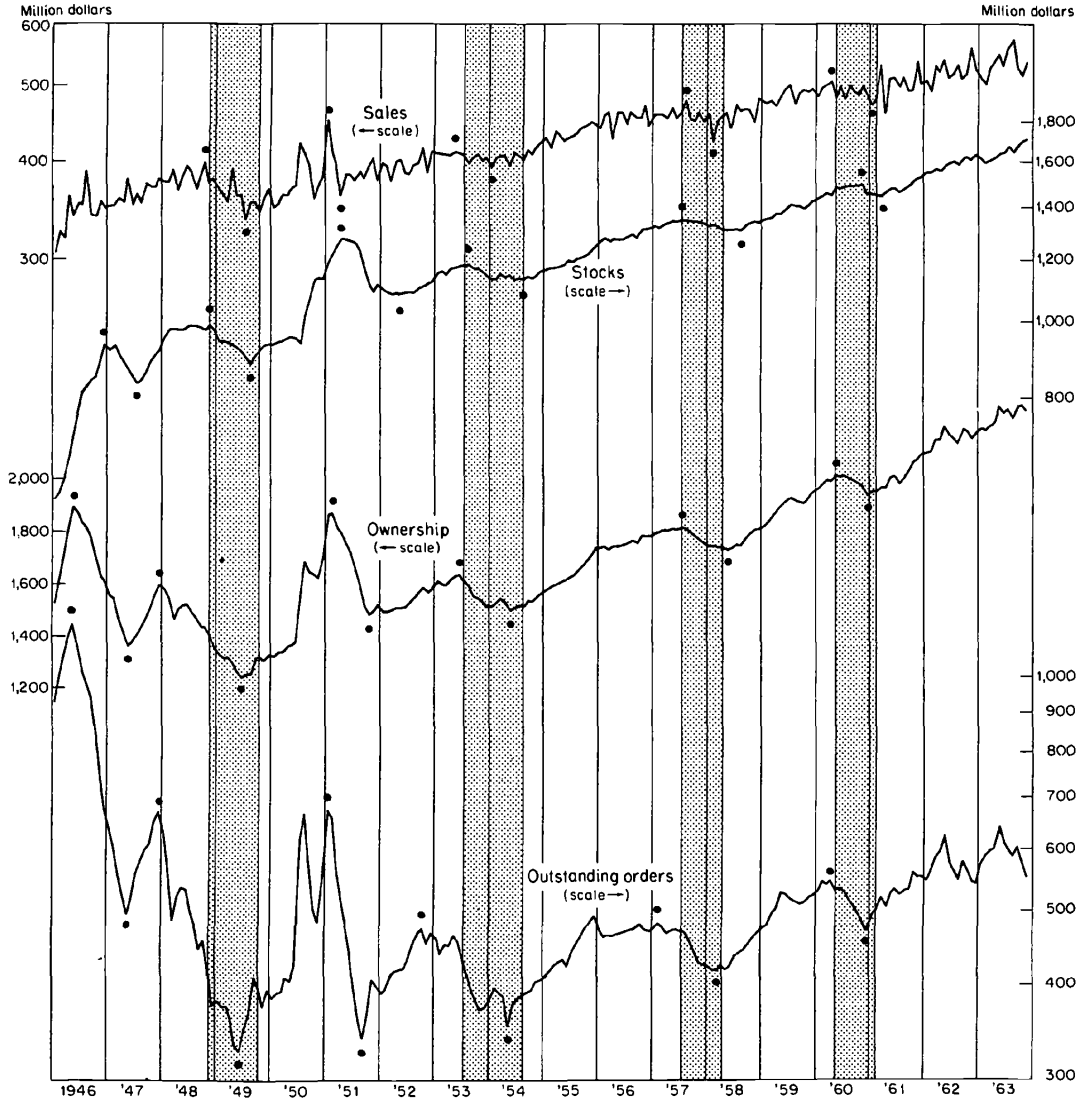
Waves in ownerhip, Chart 4 suggests, conform quite neatly to business cycles. Ownership and each of its two components show the two extra cycles at the time of the phantom postwar recession and of the Korean War. During the former, sales did not decline.

Table 9 shows in the last two columns, lines 2, 6, and 11, that all of these stock series dis-

[1] See Chapter 2, note 6.

CHART 4

Ownership, Stocks, and Outstanding Orders, Department Stores, 1946–63



Note: Shaded areas represent business contractions. Specific cycle turns are marked by dots.

play reasonable conformity with the subcycle chronology, after adjustment for characteristic timing relationships. Stocks on hand show a strong association on a synchronous basis; 91 per cent of the months from mid-1946 through 1961 are in like phase. Outstanding orders lead by an average of four months. Ownership is, of course, intermediate, with a median lead of two months. Since 1948, peaks in ownership and in the business subcycle chronology have all been virtually synchronous. Troughs have tended to lead (line 2). Outstandings for department stores, like those for durable goods manufacturers, tend to lead substantially more at peaks in business affairs than at troughs. But unlike durables, the pre-

TABLE 9

Timing: Stocks on Hand and on Order, Department Stores, 1946–62

Line	Reference Series[c]	Section A: Months Lead (-) or Lag (+) for Matched Turns[a] Chronology[b] P (1/47)	T (7/47)	P 11/48	T 10/49	P (2/51)	T (6/52)	P 7/53	T 8/54	P 7/57	T 4/58	P 5/60	T 2/61
						Specific Series: Ownership							
1	Business cycles			-11	-4			-1	-3	0	+1	0	-2
2	Subcycles	-8	-2	-11	-4	0	-8	-1	-3	0	+1	0	-2
3	Outstanding orders	0	0	0	0	+1	+1	+8	0	+5	+2	+1	0
4	Ownership, durables	-7	-6	-8	-3	☒	☒	+9	-5	+5	-1	+4	0
						Specific Series: Stocks							
5	Business cycles			0	-2			+1	0	0	+4	+6	+1
6	Subcycles	-1	0	0	-2	+2	-1	+1	0	0	+4	+6	+1
7	Ownership	+7	+2	+11	+2	+2	+7	+2	+3	0	+3	+6	+3
8	Outstanding orders	+7	+2	+11	+2	+3	+8	+10	+3	+5	+5	+7	+3
9	Stocks, durables	☒	☒	-3	-5	-11	-2	0	-4	+5	0	+6	-3
						Specific Series: Outstanding Orders							
10	Business cycles			-11	-4			-9	-3	-5	-1	-1	-2
11	Subcycles	-8	-2	-11	-4	-1	-9	-9	-3	-5	-1	-1	-2
12	Outstanding orders, durables	-2	-6	-8	-3	-6	-6	+1	-5	+6	-3	+5	0

(continued)

TABLE 9 (concluded)

Line	Reference Series[c]	Section B: Average Timing of Turns — Number Matched (- + 0)	Median[e] P	Median[e] T	Median[e] All	Average Deviation[f] P	Average Deviation[f] T	Average Deviation[f] All Turns Wt'd	Section C: Percentage of Months in Like Phase[d] — Timing Adjustment[g]	% Mos. 7/46–12/61
		Specific Series: Ownership								
1	Business cycles	5 1 2	-0.5	-2.5	-1.5	3.0	1.5	2.5 2.2	-1, -2	79
2	Subcycles	8 1 3	-0.5	-2.5	-2.0	3.3	2.0	2.8 2.7	-2	82
3	Outstanding orders	0 6 6	+1.0	0	+0.5	2.2	0.5	1.5 1.3	0,+1	90
4	Ownership, durables	6 3 1	+0.7	-3.0	-2.0	6.5	2.0	4.6 4.2	-1, -2	71
		Specific Series: Stocks								
5	Business cycles	1 4 3	+0.5	+0.5	+0.5	1.8	1.8	1.8 1.8	0,+1	82
6	Subcycles	3 5 4	+0.5	0	0	1.7	1.3	1.5 1.5	0	91
7	Ownership	0 11 1	+4.0	+3.0	+3.0	3.3	1.0	2.2 2.2	+3	87
8	Outstanding orders	0 12 0	+7.0	+3.0	+5.0	2.2	1.5	2.5 1.8	+5	84
9	Stocks, durables	6 2 2	+0.7	-3.0	-2.5	5.1	1.4	3.5 3.3	-2	77
		Specific Series: Outstanding Orders								
10	Business cycles	8 0 0	-7.0	-2.5	-3.5	3.5	1.0	2.8 2.2	-4	79
11	Subcycles	12 0 0	-6.5	-2.5	-3.5	3.5	1.8	3.0 2.7	-4	81
12	Outstanding orders, durables	8 3 1	-0.5	-4.0	-3.0	4.7	1.8	3.4 3.2	-3	78

Notes to Table 9

[a]Specific series are matched with the indicated reference series (see note c) in accordance with the standard NBER rules. A double relaxation of rules is marked r; it applies to cases for well-conforming series in which two like turns are matched, though an unlike turn lies between them. The figure is underlined when subcycle chronology is the reference series, a minor cycle in the specific series has entered a comparison; or, when two individual series are compared, a minor cycle in either series has entered a comparison. When the business cycle chronology provides the reference, minor specific cycle turns are ignored. The meaning of other symbols is:

- ⊕ turn in the reference series does not appear in the specific series.
- ⊖ turn in the specific series does not appear in the reference series.
- ⊙ there is no turn in either series in the neighborhood of the chronology date.

[b]Chronology dates are business cycle reference dates. In addition, four minor subcycle dates, enclosed in parentheses, are added to form a subcycle chronology.

[c]Reference series are of three sorts: (1) the business cycle chronology as shown in column heads, excluding the dates in parentheses; (2) the subcycle chronology as shown in all column heads; (3) particular series whose specific cycles and minor cycles constitute the reference dates for the comparison.

[d]The number of months during which the specific series is in like phase with the reference series is expressed as a percentage of total number of months covered between dates as given.

[e]Median is the average timing of the center two or three turns.

[f]Average deviation from the median. The "weighted" (wt'd) average is the deviation from the median for peaks and for troughs separately, weighted by the number of turns.

[g]In determining months in like phase a timing adjustment is made which maximizes confluence. Before counting the months in phase, the specific series is in effect moved to the right to allow for a lead and to the left to allow for a lag if by so doing the percentage of months in like phase (as rounded) is increased. If the months in phase are as large or larger without an adjustment, this is indicated by a "timing adjustment" of 0.

In some cases we wish to know the percentage of months in phase on a synchronous basis, regardless of whether the percentage in phase is thereby maximized. If so, the "timing adjustment" is given as "none."

dominant timing even at troughs is that of a lead, however short.[2]

For department stores, as for durable goods manufacturers, the two parts of ownership—stocks and outstanding orders—display the same three relationships. First, turns in outstanding orders precede those in stocks. They lead at each turn, as Table 9, line 8, shows. (The table shows the lag of stocks instead.) Second, the lead is somewhat longer at peaks than at troughs. The median for all turns is five months, with seven as a typical figure at peaks and three at troughs. The difference is quite persistent.[3] In view of the fact that orders

[2] A corollary is that at troughs the various stock series for department stores regularly lead those of durable goods manufacturers. The figures are given in lines 4, 9, and 12 of the table. This could reflect a closer control of stocks in retail stores because of the critical importance of stock management to successful store operation. However, the conclusion would be premature since Table 15 will show that the same tendency to lead at troughs characterizes retail sales compared with shipments of durable goods manufacturers. But here again the meaning must be considered in the light of the fact that the advice about an upturn in customer buying has taken place at just about the same time for department stores (via their sales) and durable goods manufacturers (via their sales orders, that is, orders received). As will be seen later, four troughs occur synchronously or within one month in the two series, and department stores lead at one turn—in 1951. Thus the figures do not seem to throw much light on the dynamics of stock management. However, we can, I think, conclude that the impact on the economy of the small segment of consumer buying represented by large department stores may, for whatever weight it had, have tended to shorten the duration of contractions.

[3] When the timing at each peak is compared with the previous and following troughs, peaks lead nine times and lag and synchronize one time each. The

average only about one month's sales, the length of this lead is puzzling and demands explanation after the rest of the evidence is in.[4]

Third, stocks and outstandings display strong correspondence in the timing of specific fluctuation. Eighty-four per cent of the months between mid-1946 and the end of 1961 were in parallel phase after allowing for a lead of five months (line 8, section C). If the allowance is based on the characteristic behavior at peaks and at troughs separately—leads of seven and three months respectively—the percentage of months in phase rises to 89.

A glance at Chart 4 suggests that the correlation in amplitudes for matched cycles in stocks and outstandings, noted for durables, may be absent or at least harder to detect where the relative sensitivity of stocks and outstandings to trend and cyclical influences is so exceedingly different. This question is discussed in the course of the next section along with other matters bearing on amplitude.

AMPLITUDE

As Chart 4 suggests, ownership undergoes substantial cyclical fluctuation. The two components, outstandings and stocks, play about an equal part in the fall during business cycle contractions, whereas stocks play a far more important part in the rise during expansions; this is true whether concern focuses on change per phase or per month. The figures are given, phase by phase, in Table 10 and summarized in section B (see particularly columns 6 and 7, line 3).

The specific amplitude as measured in Table 11 highlights the intrinsic variability of each series. Average monthly rises or falls during *specific* cycle expansions or contractions show that outstandings fluctuate somewhat more in absolute terms (lines 2 and 3, column 5 or 8) than do stocks, which are, it will be recalled, on the average about two and a third times as large for the period as a whole. Rises in outstandings are much smaller relative to rises in stocks than are falls (line 3, columns 9 and 10).

At first thought, it seems possible that cancellations in outstanding orders when business recedes might be largely responsible for the asymmetrical behavior. But there is an alternative explanation involving the arithmetic of combining a shared upward trend influence for two series for which cyclical volatility differs.[5]

Comparing amplitude for matched phases of outstandings and stocks (a duplication of the measure for durables described in Chapter 4, note 10), contractions in the dollar volume of stocks are found to have almost exactly half the amplitude as those of outstandings (in spite of the far larger size of total stocks).

average deviation of 2.2 at peaks and 1.5 at troughs is also small enough (in view of the length of the leads) to cause the differences to be taken seriously. When the difference in characteristic timing is taken into account, the average deviation is reduced from 2.5 to 1.8 (columns B9 and 10).

[4] For department stores, unlike durable goods manufacturers, it will be recalled, the statistics are able to give the size of outstandings and stocks relative to that of sales without equivocation.

[5] When this is the case, the cyclically sensitive series can have contractions which are relatively larger compared with those of the insensitive series than are their respective amplitudes of expansion. Assume two series have an upward trend of 2 per cent a year. Series A starts at 300, series B at 100. The pure cyclical component is 5 per cent of each cycle phase for series A and 20 per cent for series B. Expansions last two years and contractions one year.

		Expansion			*Contraction*		
		Trend	Cycle	Total	Trend	Cycle	Total
Series A	300	+12	+15	+35	+6	−15	−9
Series B	100	+4	+20	+24	+2	−20	−18
Ratio A/B				.69			2.0

TABLE 10

Reference Cycle Amplitude of Stocks and Outstanding Orders, Department Stores, 1946-62[a]
(million dollars)

A: Rise or Fall (-) During Reference Phases

	Contraction 11/48–10/49	Expansion 10/49–7/53	Contraction 7/53–8/54	Expansion 8/54–7/57	Contraction 7/57–4/58	Expansion 4/58–5/60	Contraction 5/60–2/61
1. Ownership	-84.0	299.7	-89.0	292.3	-80.0	273.7	-50.0
2. Stocks	-62.7	260.7	-42.7	207.3	-30.7	159.0	-20.0
3. Outstanding orders	-21.3	39.0	-46.3	85.0	-49.3	114.7	-30.0

B: Average Rise or Fall (-) During Reference Phases

	Per Phase		Per Month[a]			Amplitude as % of Amplitude of Stocks[b]		
	Expansion	Contraction	Expansion	Contraction	All Phases	Expansion	Contraction	All Phases
1. Ownership	288.6	-75.8	8.24	7.21	7.95	138	194	149
2. Stocks	209.0	-39.0	5.97	3.72	5.33	100	100	100
3. Outstanding orders	79.6	-36.8	2.27	3.50	2.62	38	94	49

Note: The measures are those of the standard NBER business cycle analysis.

[a]Per month amplitude measures are the sum of the rises divided by the total number of months of cyclical expansion and analogously for contractions. For the total, falls (carrying a negative sign) are subtracted from total rises and divided by the number of months between first and last peak or trough.

[b]Per month amplitudes of ownership and outstandings as percentage of the corresponding figure for stocks.

For expansions, however, there was little or no correlation.

Returning to the character of typical amplitudes of fluctuation, several contrasts between department stores and durable goods manufacturers have been noted. Table 12 converts specific cycle measures to relatives of the average standing of the data over each cycle. Accordingly, the figures give an approximate percentage variability which affords comparison among various sorts of enterprises and statistics.

Outstandings of both department stores and durable goods manufacturers undergo fluctuations that involve an average rise or fall of about 2 per cent a month relative to their average level (lines 1 and 4, last column). Stocks of durable goods manufacturers fluctuate about half as violently—about 1 per cent of their average level per month—and those of department stores still less so. But the general impression that the table conveys is one of rather surprising similarities in the relative degree of instability of the outstanding orders of manufacturers of durable goods and of department stores (see lines 7 and 8). Durable goods manufacturers, after all, themselves have large changes in backlogs of cus-

TABLE 11

Average Specific Cycle Amplitude, Stocks and Outstanding Orders, Department Stores, 1946-62

	Period Covered (1)	No. of Cycles (2)	Amplitude Per Phase[a] (million dollars) Expansion (3)	Contraction (4)	All Phases (5)	Amplitude Per Month[a] (million dollars) Expansion (6)	Contraction (7)	All Phases (8)	Amplitude as % of Amplitude of Stocks[b] (million dollars) Expansion (9)	Contraction (10)	All Phases (11)
1. Ownership	T 5/47 to T 12/60	5	297.0	183.9	240.4	13.62	-17.02	14.75	159	243	183
2. Stocks	T 7/47 to T 3/61	5	193.3	71.5	132.4	8.55	-7.01	8.07	100	100	100
3. Outstanding orders	T 5/47 to T 12/60	5	152.1	158.7	155.4	7.84	-12.02	9.53	92	171	118

[a]Measures are based on the standard NBER business cycle analyses; per month amplitude is the "weighted" average: the sum of the rises minus the sum of the falls divided by the number of months of expansion or contraction between the first and last peak or trough dates included.

[b]Per month amplitude of ownership and outstandings as percentage of the corresponding figure for stocks.

tomers' orders on the books; they buy materials which are not typically style sensitive or perishable, materials whose prices may well undergo substantial fluctuations. Merchants, on the other hand, sell on demand; they often buy highly style-sensitive goods, and at prices which often remain unchanged during a season.

Perhaps these differences in business problems are reflected in the *proportion* of total provisions that are carried on hand compared with those carried on order, rather than in the way in which each type of reservoir *fluctuates* relative to its average level. But if so, implications follow. The amplitude of ownership as a whole is greater for durable goods manufacturers than for department stores because the more volatile part, outstanding orders, is relatively far larger. This means that suppliers of durable goods manufacturers are confronted with a stream of new orders that fluctuate more extremely than those received by the suppliers of department stores.

FIRST THRUST OF EXPANSIONS

For department stores, as for durables, most of the impact of rising outstandings was spent early in business expansions. Using the same dates to delineate the first segment of expansion that were applied to manufacturing, the story of Table 4 repeats itself in Table 13. Outstanding orders show these thrusts most sharply. Indeed, they reach their major cyclical highs before the beginning of 1947 and at the peak of the Korean boom. Beginning in 1948, the average monthly rate of rise during all of these first stretches, which lasted for a year

TABLE 12

Average Specific Cycle Amplitude Per Month in Cycle Relatives, Materials Stocks and Outstanding Orders, Department Stores and Durable Goods Manufacturers, 1946-62

	First and Last Peak or Trough Date	Amplitude Per Month, Cycle Relatives[a]		
		Rise	Fall	Average Rise and Fall
	Department Stores			
1. Outstandings	5/47 – 12/60	1.69	-2.56	2.04
2. Stocks	7/47 – 3/61	.75	-.65	.72
3. Amplitude of outstandings as % of stocks		225	394	283
	Durable Goods Manufacturers			
4. Outstandings	7/46 – 2/62	2.01	-2.22	2.11
5. Stocks	2/49 – 5/62	1.04	-1.08	1.06
6. Amplitude of outstandings as % of stocks		193	206	199
	Amplitude for Department Stores as % of Durable Goods			
7. Outstandings		84	115	97
8. Stocks		72	60	68

[a]Cycle relatives give rises or falls expressed as a percentage of the average monthly standing of the series, cycle by cycle.

to a year and a half (longer than total contraction) was much higher than the fall during contractions—$10.2 and $3.2 million per month respectively (bottom line, columns 9 and 14).[6]

Comparable figures for total ownership are shown in the upper half of the table. Though the amplitude of movement is about double that of outstandings, the first subcyclical rises again show monthly rates of decrease that are much faster than is the rate of increase during contractions—$20.8 and $7.8 million per month respectively.

Table 14 eliminates the influence of differences in business cycle conformity by using a specific cycle framework. The terminal dates for the first thrusts are selected by the same rule used for durable goods manufacturing; they last between fifteen and nineteen months for outstandings and fourteen to twenty months for ownership. Here again, both for outstandings and for ownership, the monthly rate of rise during the periods of thrust was as fast or faster than the rate of fall during

[6] It seems preferable to exclude the period prior to the peak in 1948 from the averages because of the distortion imparted by the postwar adjustments; outstandings declined during the reference expansion.

TABLE 13

Amplitude During Reference Cycle Phases and First Subcycle Expansion,[a] Ownership and Outstanding Orders, Department Stores, 1946-62

Expansions									Contractions				
Reference Dates			Interval (months) Trough to:		Rise ($ million)[b]				Reference Dates		Interval	Fall ($ million)	
					Total		Per Month						
Trough	Peak	Sub Peak[a]	Peak	Sub Peak	Cycle	Sub C.	Cycle	Sub C.	Peak	Trough	(mos.)	Total	Per Mo.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) 6÷4	(9) 7÷5	(10)	(11)	(12)	(13)	(14)
						Ownership							
1/46[c]	11/48	1/47	34	(12)[d]	-124	27	-3.6	2.2					
									11/48	10/49	11	-88	-8.0
10/49	7/53	2/51	45	16	292	556	6.5	34.8					
									7/53	8/54	13	-92	-7.1
8/54	7/57	12/55	35	16	302	222	8.6	13.9					
									7/57	4/58	9	-81	-9.0
4/58	5/60	3/59	25	11	281	118	11.2	10.7					
									5/60	2/61	9	-66	-7.3
Average	11/48	to 2/61	35	14.3	292	297	8.3[e]	20.8[e]			10.5	81.8	-7.8[e]
						Outstanding Orders							
1/46[c]	11/48	1/47	34	(12)[d]	-521	-299	-15.3	-24.9					
									11/48	10/49	11	-16	-1.5
10/49	7/53	2/51	45	16	34	263	0.8	16.4					
									7/53	8/54	13	-43	-3.3
8/54	7/57	12/55	35	16	84	106	2.4	6.6					
									7/57	4/58	9	-45	-5.0
4/58	5/60	3/59	25	11	105	71	4.2	6.4					
									5/60	2/61	9	-29	-3.2
Average	11/48	to 2/61	35	14.3	74.3	146.7	2.1[e]	10.2[e]			10.5	33.2	-3.2[e]

[a]Two of the dates are part of a previously selected subcycle chronology; two are otherwise chosen (see discussion of Table 4 in text).

[b]Based on standings for the single month of peak or trough.

[c]First month for which data are available.

[d]The interval from the business cycle trough in October 1945 was 15 months.

[e]Sum of the rises (falls) divided by the total number of months of expansion (contraction) covered.

TABLE 14

Amplitude During Specific Cycle Phases Matched with Reference Cycles and First Period of Rapid Thrust,[a] Ownership, and Outstanding Orders, Department Stores, 1946-62

Expansions									Contractions				
Specific Dates			Interval (months) Trough to:		Rise ($ million)[b] Total		Per Month		Specific Dates		Interval	Fall ($ million)	
					Cycle		Cycle Expansion						
Trough	Peak	Top of Thrust[a]	Peak	Top of Thrust	Expansion	Thrust	(6÷4)	Thrust (7÷5)	Peak	Trough	(mos.)	Total	Per Mo.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Ownership													
1/46[c]	12/47	5/46	23	(4)[d]	63	366	2.7	91.5					
									12/47	6/49	18	-343	-19.1
6/49	6/53	2/51	48	20	385	624	8.0	31.2					
									6/53	5/54	11	-134	-12.2
5/54	7/57	12/55	38	19	319	239	8.4	12.6					
									7/57	5/58	10	-85	-8.5
5/58	5/60	7/59	24	14	285	196	11.9	14.0					
									5/60	12/60	7	-86	-12.3
Average, 12/47 to 12/60			36.7	17.7	329.7	353.0	9.0	20.0[e]			11.5	162.0	-14.1[e]
Outstanding Orders													
1/46[c]	12/47	5/46	23	(4)[d]	-261	240	-11.3	60.0	12/47	6/49	18	-343	-19.1
6/49	10/52	1/51	40	19	147	346	3.7	18.2	10/52	5/54	19	-122	-6.4
5/54	2/57	11/55	33	18	127	130	3.8	7.2	2/57	3/58	13	-61	-4.7
3/58	4/60	6/59	25	15	126	107	5.0	7.1	4/60	12/60	8	-74	-9.2
Average, 12/47 to 12/60			32.7	17.3	133.3	194.3	4.1	11.2[e]			14.5	125.0	-10.3[e]

[a]Only those specific cycles are included whose troughs are matched with business cycle reference troughs. The first period of thrust starts at the specific trough and ends at the month when, in the course of its first specific cycle rise of reference expansion, the rate of rise (as measured by a five-month centered average of month-to-month change) has declined to a point halfway between its maximum and zero. Failing the necessary information for the first period, the peak and the first specific cycle were used.

[b]Based on standings for the month of peak or trough only.

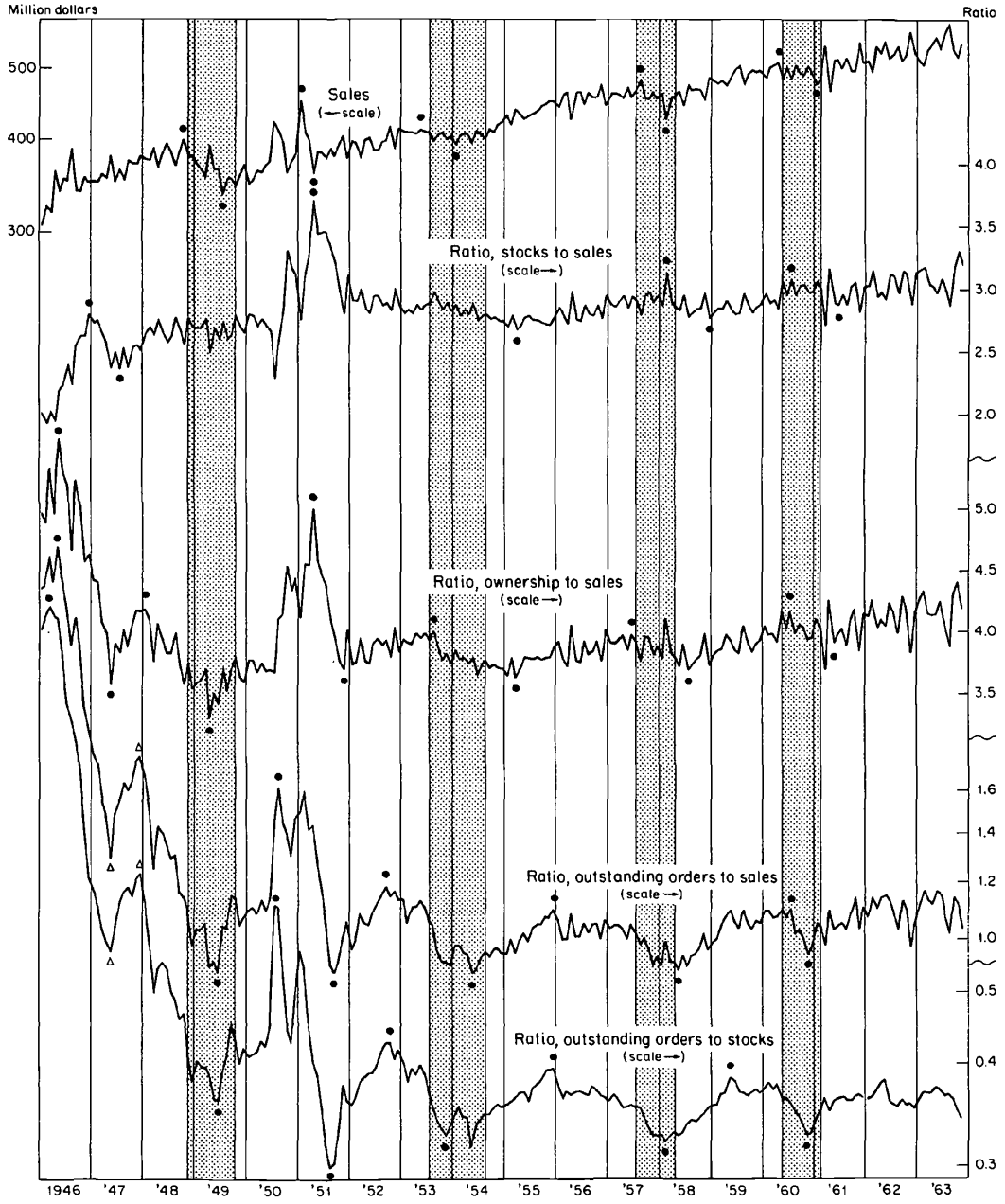
[c]First month when data are available.

[d]Period from beginning of the data, not from the previous trough.

[e]Sum of the rises (falls) divided by the total number of months of expansion (contraction) covered.

CHART 5

Selected Operating Ratios, Department Stores, 1946–63



Note: Shaded areas represent business contractions. Specific cycle turns are marked by dots, additional minor turns by triangles.

contractions (compare columns 9 and 14).

Several of the ratios in Chart 5 seem to reassert an association between the volume of goods on order and these first surges of expansion. The level of outstandings, in terms of months' sales (ratio of outstanding orders to sales), curve 4 of the chart, reaches virtually its cyclical highs at or before the end of the first spurt of expansion. The same is true of the ratio of outstandings to stocks, the bottom curve.

The marked activity of outstandings in the first part of expansions, and the leveling or sometimes the fall followed by a subsequent resumption, seem to convey the special quality of behavior generated by decisions which relate to procurement rather than to sales. Sales (top curve) continued to rise throughout 1947; their fall after the Korean speculative episode was sharp and brief; they continued to rise after the end of 1955 and early 1959. Nevertheless, department store buying changed in a fashion which caused an extra wave in the first two cycles and an early flattening in the later ones. Obviously there is a great deal to learn about why this should be.

RELATION BETWEEN SALES AND STOCKS

Parallelism in Sales and Stocks

One would expect that the usual need of any business enterprise to keep stocks in line with the volume of sales in some systematic fashion would be especially acute in connection with the cumbersome stock-carrying functions of retail stores. Accordingly, the broad parallelism between sales and stocks, shown in Chart 4, is no surprise. Table 15, line 5, shows that stocks lag sales on the average by about three months; allowing for this lag, 80 per cent of the months are in like phase. Because sales do not drop in 1947 though stocks do, 82 per cent of the months are in like phase starting at the beginning of 1948. Outstanding orders have a somewhat less regular association with sales partly because of long leads at peaks and a slight tendency to lag at troughs. When stocks on hand and on order are summed, the association is not very different from that of stocks—80 per cent of months are in phase for the whole period, and 84 per cent starting in 1948. However, six of the ten turns are within one month of one another. This could reflect a deliberate effort to have "in-sights" rise when sales rise and fall when they fall. But if the possibility of a deliberately enforced systematic association is not ruled out, what is the character of the system?

Stock-Sales Ratios

The ratios of Chart 5 tell the story. Stocks, as noted earlier, represented about three months' sales, and outstandings one month's. The number of months' sales carried in stock on hand and on order has perhaps been subject to a slight upward trend since 1949.[7]

The chart also shows that retailers have not tended to carry a constant number of weeks' supply either on hand or on order. The ratios move in clearly defined cycles. Table 16, line 1, indicates that stocks on the average were 1.5 weeks' supply higher at peaks than at troughs in the ratio, about 13 per cent more than the nearly twelve weeks' supply that characterized troughs. For outstandings (line 4), peaks were 44 per cent higher than troughs. Total ownership, which would seem to be the most readily controlled aggregate, was 2.1 weeks', or 13 per cent, higher at its peaks than at troughs. Though the differences are

[7] During the war stocks fell and outstandings rose relative to sales. so that the early postwar years moved back toward more usual relationships.

TABLE 15

Timing: Sales and Stocks on Hand and on Order, Department Stores, 1946–62

Section A: Months Lead (-) or Lag (+) for Matched Turns[a]

Line	Reference Series[c]	Chronology[b] P (1/47)	T (7/47)	P 11/48	T 10/49	P (2/51)	T (6/52)	P 7/53	T 8/54	P 7/57	T 4/58	P 5/60	T 2/61
						Specific Series: Sales							
1	Business cycles			-1	-3			-2	-7	+1	-2	-1	-1
2	Subcycles	⊕	⊕	-1	-3	-1	-14	-2	-7	+1	-2	-1	-1
3	Shipments, durables	⊙	⊙	-2	-3	-2	-15	-2	-9	+7	-2	+10	0
						Specific Series: Ownership							
4	Sales	⊗	⊗	-10	-1	+1	+6	+1	+4	-1	+3	+1	-1
						Specific Series: Stocks							
5	Sales	⊗	⊗	+1	+1	+3	+13	+3	+7	-1	+6	+7	+2
						Specific Series: Outstandings							
6	Sales	⊗	⊗	-10	-1	0	+5	-7	+4	-6	+1	0	-1

Section B: Average Timing of Turns

Line	Reference Series[c]	Number Matched -	+	0	Median[e] P	T	All	Average Deviation[f] P	T	All Turns Wt'd		Section C: Timing Adjustment[g]	Section C: % Mos. 7/46–12/61
							Specific Series: Sales						
1	Business cycles	7	1	0	-1.0	-2.5	-1.5	0.8	1.8	1.5	1.2	-1, -2	92
2	Subcycles	9	1	0	-1.0	-4.0	-1.5	0.6	3.8	2.5	2.2	-1, -2	83
3	Shipments, durables	7	2	1	+1.0	-4.7	-2.0	4.0	4.7	4.4	4.4	-2	76
							Specific Series: Ownership						
4	Sales	4	6	0	+0.3	+2.0	+1.0	2.7	2.6	2.7	2.7	+1	80[h]
							Specific Series: Stocks						
5	Sales	1	9	0	+2.3	+5.0	+3.0	2.1	3.6	3.0	2.9	+3	80[h]
							Specific Series: Outstandings						
6	Sales	5	3	2	-4.3	+1.3	-0.5	3.7	2.3	3.5	3.0	0, -1	75[h]

For notes a through g, see Table 9.

[h]For the period January 1948 to December 1961, the percentage of months during which shipments and each stock series were in phase was: ownership 84 per cent, stocks 82 per cent, and outstandings 79 per cent.

TABLE 16

Average Amplitude and Conformity of Stock-Sales Ratios During Expansion Phases Variously Defined, Department Stores, 1948-61

Line	Ratio to Sales	Reference for Expansion Phases in Ratio	Standing of Ratios, Weeks[a]				% Months When Ratio was in Rising Specific Phase During Expansion Phases of:[c]	
			Standing at		Peaks Minus Troughs[b]	Peaks as % of Troughs[b]		
			Troughs (1)	Peaks (2)	(3)	(4)	Sales (5)	Business Cycles (6)
	Stock							
1		Ratio[d]	11.7	13.2	1.5	113		
2		Sales[e]	11.7	12.8	1.1	109	59	
3		Business cycle[f]	11.7	13.1	1.4	112		64
	Outstandings							
4		Ratio[d]	4.0	5.7	1.7	144		
5		Sales[e]	4.0	5.7	1.7	144	59	
6		Business cycle[f]	4.0	5.9	1.9	148		57
	Ownership							
7		Ratio[d]	16.1	18.2	2.1	113		
8		Sales[e]	16.1	17.9	1.8	111	68	
9		Business cycle[f]	16.1	18.1	2.0	113		74

[a]The individual standings are two-month averages of monthly data for peak (trough) month and the higher (lower) of the two adjacent months. If the peak (trough) was erratically high (low), a three-month centered average was used. Monthly data were converted to weeks by assuming that there are 4.5 weeks per month. The Figures average the individual standings for the fourteen years from the beginning of 1948 to the end of 1961.

[b]Based on average standings (not on standing for each phase averaged).

[c]These are the same measures as those appearing in section C of the timing tables except that they are confined to the periods when the reference scheme (specific cycles in sales for column 5 and business cycle chronology in column 6) is in rising phase. Comparisons are made without a timing adjustment.

[d]Standings are taken at specific cycle peaks and troughs in the ratio.

[e]The peak standing is that of the high reached in the ratio during each specific cycle in sales. Trough standing is that of the specific cycle trough in the ratio matched with each specific cycle trough in sales.

[f]The peak standing is that of the high reached in the ratio during each business cycle expansion. Trough standing is that of the specific cycle trough in the ratio matched with each reference trough.

not dramatic, they are systematic. Apparently, then, if retailers were trying to keep a constant number of weeks' supply on hand, they did not achieve it.

Moreover, further study of the ratios suggests that the maintenance of a constant ratio could hardly have been an all-important management goal. Stocks increased more than sales at times when there is no reason to assume that the result was undesired, since the ratio rose during a substantial part of the time when sales were rising. At such times, stocks are not likely to pile up for the reason that goods did not move as rapidly as they were expected to at the time when they were purchased. As column 5 shows, the ratio for ownership was rising 68 per cent of the time that sales were rising, that is, the number of weeks' supply in sight was increasing; for stocks alone, the figure was 59 per cent. The timing measures of Section A, Table 17, line 4, show that the rising phase of the ownership ratio started no more than seven months after the trough in sales on all but one occasion and even led once; the average was a lag of five months (column B5). The fact that the ratio also stopped rising a few months before or after the peak in sales—the average timing was synchronous (column B4)—suggests that things were not seriously out of hand at peaks either. Stocks on hand also started to rise well within the first half of expansion phases in sales (line 9); Chart 5 perhaps provides a clearer view.

The rises in the ratio were not negligible during the periods of rising sales. For outstandings and total ownership, very nearly the whole specific variability in the ratio occurred when sales were rising (compare Table 16, lines 4 and 5, 7 and 8, column 4); for stocks, the highs during rising sales were 9 per cent higher than the troughs (Table 16, line 2, column 4). The meaning of these figures depends on the standard against which they are compared. As we saw in Chapter 2, a constant ratio should be read as itself implying stocks that are larger than need be for efficient servicing of rising sales, other things the same. Just how much higher is a question that needs to be asked later on.

It is clear enough without going into specifics that when, during cyclical expansion, stocks or ownership increase not only in line with sales but more so, the general impact on the economy, at least at the time, will be stimulating. And Table 16 shows that the full impact of expansion in the ratio actually did occur during business expansion (compare lines 1 and 3, 4 and 6, 7 and 8). Moreover, the stock-sales ratio was rising 64 per cent of the months designated as business expansions, and the ownership ratio rose 74 per cent of these months (column 6).

The stimulating impact of the rise in total ownership for department stores, unlike that of ownership for durable goods, continued into the neighborhood of peaks in expansions. Since 1949, the ratio turned within two months of the four business cycle and minor peaks (Table 17, line 2).[8]

Outstandings, though not stocks, also appeared to conform to periods of thrust as defined by the chronology previously described. (The terminal dates were February 1951, December 1955, and March 1949.) Study of Chart 5 indicates that retailers not only increased outstandings at these periods but increased them relative to sales. The ratio of outstanding orders to sales roughly reached its maximum height for the phase by the end of the periods of thrust. During the rest of business cycle expansion, the number of months' sales on order either declined or remained about the same.

[8] The ownership-sales ratio for department stores has a very irregular association with that for durable goods manufacturers; it lags as often as it leads (Table 17, line 5). The irregular association may be caused by the strong influence of department store ownership of stocks on hand rather than on order; for durable goods manufacturers, stocks on order dominate the pattern of ownership. For each of the two segments of ownership the ratios for department stores, with the exception of one synchronous turn, always turned earlier than for durable goods manufacturers (Table 17, lines 10 and 15).

TABLE 17

Timing: Stock-Sales Ratios, Department Stores, 1946–61

Line	Reference Series[c]	Section A: Months Lead (−) or Lag (+) for Matched Turns[a] — Chronology[b]											
		P (1/47)	T (7/47)	P 11/48	T 10/49	P (2/51)	T (6/52)	P 7/53	T 8/54	P 7/57	T 4/58	P 5/60	T 2/61
		Specific Series: Ratio of Ownership to Sales											
1	Business cycles			−10	−6			+1	+7	−1	+3	+2	+3
2	Subcycles	−8	−2	−10	−6	+2	−7	+1	+7	−1	+3	+2	+3
3	Ownership	0	0	+1	−2	+2	+1	+2	+10	−1	+2	+2	+5
4	Sales	⊗	⊗	−9	−3	+3	+7	+3	+14	−2	+5	+3	+4
5	R:ownership to shipments dur.*	⊗	⊗	⊗	−14	−3	⊗	⊗	+3	+11	−5	+4	⊕
		Specific Series: Ratio of Stocks to Sales											
6	Business cycles			⊕	⊕			−27	+7	+7	+8	+2	+4
7	Subcycles	−1	0	⊕	⊕	+2	⊕	⊕	+7	+7	+8	+2	+4
8	Stocks	0	0	⊕	⊕	0	⊕	⊕	+7	+7	+4	−4	+3
9	Sales	⊗	⊗	⊕	⊕	+3	⊕	⊕	+14	+6	+10	+3	+5
10	R: material stks to ship., dur.*	−8	−8	⊕	⊕	−8	⊕	⊕	−4	−1	−4	−6	⊕
		Specific Series: Ratio of Outstanding Orders to Sales											
11	Business cycles			−11	−4			−10	−3	−19	+1	+2	−3
12	Subcycles	−8	−2	−11	−4	−6	−9	−10	−3	−19	+1	+2	−3
13	Outstandings	0	0	0	0	−5	0	−1	0	−14	+2	+3	−1
14	Sales	⊗	⊗	−10	−1	−5	+5	−8	+4	−20	+3	+3	−2
15	R: outstandings to ship., dur.*	⊗	⊗	⊗	−3	−11	⊗	⊗	−2	−7	−7	−8	⊕
16	R: stocks to sales	−7	−2	⊗	⊗	−8	⊗	⊗	−10	−26	−7	0	−7
		Specific Series: Ratio of Stocks to Sales											
17	R: ownership to sales	+7	+2	⊕	⊕	0	⊕	⊕	0	+8	+5	0	+1
18	R: outstandings to sales	+7	+2	⊕	⊕	+8	⊕	⊕	+10	+26	+7	0	+7

(continued)

TABLE 17 (concluded)

Line	Reference Series[c]	Section B: Average Timing of Turns — Number Matched (- + 0)	Median[e] P	Median[e] T	Median[e] All	Average Deviation[f] P	Average Deviation[f] T	Average Deviation[f] All Turns	Average Deviation[f] All Turns Wt'd	Section C: Percentage of Months in Like Phase[d] — Timing Adjustment[g]	% Mos. 7/46–12/61
					Specific Series: Ratio of Ownership to Sales						
1	Business cycles	3 5 0	0	+3.0	+1.5	3.5	3.2	3.9	3.4	+1, +2	74
2	Subcycles	6 6 0	-1.5	+0.5	-1.5	3.7	4.8	4.2	4.2	+2	73
3	Ownership	2 8 2	+0.5	+1.5	+1.0	1.3	3.2	2.0	2.2	+2	88
4	Sales	3 7 0	0	+5.3	+3.0	3.6	4.1	4.5	3.8	+3	70
5	R: ownership to shipments, dur.*	3 3 0	+4.0	-5.3	0	4.7	5.8	6.7	5.2	0	60
					Specific Series: Ratio of Stocks to Sales						
6	Business cycles	1 5 0	-5.3	+6.3	+5.5	13.8	1.5	7.2	7.7	+5, +6	67
7	Subcycles	1 6 1	+2.0	+5.5	+3.0	2.0	2.8	2.9	2.4	+3	75
8	Stocks	1 4 3	0	+3.5	+1.5	2.8	2.0	3.1	2.4	+2	74
9	Sales	0 6 0	+4.0	+9.7	+5.5	1.3	3.1	3.2	2.2	+5, +6	65
10	R: material stks to ship., dur.*	7 0 0	-7.0	-5.3	-6.0	2.2	1.8	2.1	2.0	-6	74
					Specific Series: Ratio of Outstanding Orders to Sales						
11	Business cycles	6 2 0	-10.5	-3.0	-3.5	5.5	1.2	5.1	3.4	-3, -4	62
12	Subcycles	10 2 0	-9.0	-3.0	-5.0	4.7	2.0	4.5	3.3	-5	71
13	Outstandings	4 2 6	-0.5	0	0	3.8	0.5	2.2	2.2	0	86
14	Sales	6 4 0	-7.7	+2.0	-1.5	5.7	2.6	5.9	4.1	-1, -2	63
15	R: outstandings to ship., dur.*	6 0 0	-8.7	-4.0	-7.0	1.5	2.0	2.3	1.8	-7	75
16	R: stocks to sales	7 0 1	-7.5	-7.0	-7.0	6.8	2.0	4.4	4.4	-7	65
					Specific Series: Ratio of Stocks to Sales						
17	R: ownership to sales	0 5 3	+3.5	+1.5	+1.5	3.8	1.5	2.6	2.6	+1, +2	70
18	R: outstandings to sales	0 7 1	+7.5	+7.0	+7.0	6.8	2.0	4.4	4.4	+7	65

For notes a through g, see Table 9.

*Line 5: ratio ownership to shipments, all durables; line 10: ratio of purchased materials stocks to shipments, all durables; line 15: ratio of outstanding orders for primary metals and other durables to shipments, all durables.

SUMMARY

The forces that govern the volume of materials stocks on hand and on order appear to generate fluctuations having a number of pervasive characteristics. The following observations apply to enterprises as different as durable goods manufacturers and department stores:

1. Average holdings of goods on order were, on the average, about half the size of stocks on hand for department stores or of total stocks of durable goods manufacturers. They were about twice the size of durable goods manufacturers' stocks of materials. Because the book value of stocks on hand underwent an upward trend and outstandings did not, the latter declined somewhat relative to stocks over the period as a whole.

2. Ownership, outstanding orders, and stocks for durables and department stores conform to all postwar business cycles.

3. Outstanding orders for durables and all the stock series for department stores show the two extra movements, one at the time of the postwar phantom recession (1947) and another after the early impact of the Korean War (1951).

4. Outstandings or ownership tend to synchronize or lead either the usual business cycle chronology or the combined minor and cycle dates, the subcycle reference chronology. The lead for durable goods manufacturing is stronger at peaks; for department stores, stronger at troughs. Merchandise stocks of department stores and materials stocks of durable goods manufacturers tend to synchronize or lag. Outstandings for both types of enterprises have strong leads at reference peaks. Of the eight business cycle timing comparisons at peaks for the two series combined, four were leads of eleven to nine months, two of six or five months, and two of three and one months respectively.

5. Turns in outstanding purchase orders of durable goods manufacturers regularly lead turns in their backlogs of unfilled sales orders.

6. For both durable goods manufacturers and department stores, the time series give evidence of possible causal interrelation between stocks on hand and on order of a sort that seems reasonable. For one thing, outstandings lead stocks and by more at peaks than at troughs. For another thing, there is substantial parallelism in the direction of change, particularly if the characteristic differences in peak and trough timing are allowed for. There even appears to be a quite constant relation between the amount of rise in outstandings and the subsequent rises in stocks for durable goods manufacturers. For department stores, possibly because of the distorting influence on the comparisons of the strong upward trend, it is rather the amount of fall of outstandings that gives some indication of the severity of the associated fall in stock.

But the picture takes a puzzling turn by showing a lead, particularly at peaks, which seems much too long to be explicable in terms of the direct or inverse vestibule effect. For both department stores and durable goods manufacturers, the median lead of outstandings relative to materials stocks was seven months at peaks and three at troughs. Of the eleven timing comparisons at peaks for the two sorts of enterprises, leads of eleven or ten months occurred three times, of eight to six months six times, of five and three months two times.

7. The absolute rise or fall of outstandings of durable goods manufacturers during business cycles was far greater than that of materials stocks—about four times as large; indeed it was as large as for all stocks, twice as large during contractions. For department stores, because of the much smaller size of outstandings, the absolute rise or fall of out-

standings during all business cycle phases was about half that of stocks, but the fall was equal to that of stocks during reference contractions.

8. The total instability experienced and communicated is recorded in the specific rather than the reference measures. These also show that the book value of outstandings rose or fell more than that of materials stocks. It was again about four times as great for durable goods and a little better than equal for department stores.

9. If fluctuation is expressed as a percentage of their average level, cycle by cycle, most of the difference in the specific instability of outstandings in department stores and durable goods manufacturers disappears. These measures of relative variability show that outstandings for both sorts of enterprises tend to rise or fall during their specific cycles by a little over 2 per cent per month. Stocks vary at about half that rate, more nearly a third of it for department stores.

10. Outstanding orders for both durable goods manufacturers and department stores shoot up strongly and rapidly as business prosperity gets under way. Whether reckoned on the basis of amplitude during first segments of expansion having some general currency or on the basis of the periods of thrust of expansion in outstandings itself, the monthly rate of rise tends to be at least as large as the rate of fall during reference or specific contractions.

11. The termination of the thrusts may be followed by either a temporary decline or by a slower rate of expansion.

12. These periods of rapid rise occupy, on the average, the first fourteen months of expansion. The figure is the same whether they are dated on the basis of observation of a wide variety of economic time series or on the basis of data for manufacturers or department stores alone. Incidentally, on the same double basis, business cycle contractions averaged ten months in length. Thus the period of upward thrust tended to be a bit longer than the total period of contraction. Using three sets of dates—those based on department stores, on durable goods manufacturers, and on the wide variety of data—the nine determinations of the three post-1949 periods of thrusts were: eighteen months one time, sixteen or fifteen months five times, eleven or ten months three times.

13. The volume of ownership that is needed is of course vitally influenced by the volume of sales; its behavior therefore needs to be interpreted in terms of the number of months' sales which it services. Efficient service requirements of business might well imply that stocks change somewhat less than do sales and outstandings at least no more, other things the same. Instead, the data show that stocks rose more than proportionately during substantial parts of the intervals when sales were rising.

The more than proportional rise began quite early in expansion. For department stores and durables, the lags were about the same. Outstandings started to rise more rapidly than sales only on the average a month or so after sales themselves started to rise. For stocks, the median lag of the turn in the ratio relative to that of sales was ten months. For ownership it was five months for department stores and six months for durables. The distribution of lags for individual turns was reasonably compact. For ownership, five of the eight comparisons for the two sorts of enterprises showed lags between four and eight months, and there was only one longer lag—fourteen months. For stocks, five troughs in the ratio came within five to ten months of that of sales or shipments, and only two lags were as long as twelve and fourteen months respectively. For outstandings there were four short leads and only one lag longer than five months.

Contrary, then, to the common impression that more than proportional rise in stocks is a phenomenon of late expansion only, it is clear that, for both sorts of enterprises, it started in outstandings almost immediately and in materials stocks proper within half to

one year after sales started to rise. Stocks rose about three-fifths of the entire time that department store sales rose and over two-fifths of the time that shipments rose.

14. But quantitatively the more than proportional rise in stocks is subtle. It might pass relatively unnoticed in business management channels. Confined to periods when sales were rising, peaks in the ratios, either for durables or department stores, were about 10 per cent higher than troughs. For outstandings, the difference was of an entirely different order of magnitude—about 45 per cent for both sorts of enterprises.

These observations bear on both of the major groups of questions that need to be asked. On the one hand, much of the information describes the way in which ownership and its parts participate in economic fluctuation. Indeed, it seems clear that in addition to *reflecting* prosperity and recession, ownership and its parts are potentially also *active participants* in economic fluctuation. Note the systematic leads (paragraphs 2, 4, 5), the extra cycles and early thrusts (paragraphs 3, 10, 11, 12), the more than proportionate increase in stocks during expansions (paragraphs 13 and 14). They are potentially able to play a role of some importance because they fluctuate with considerable vigor and are large in their absolute impact (paragraphs 1, 7, 13).

But the observations also hint at behavior that may help to understand how change takes place and why. The systematic and leading relationship of outstandings relative to stocks (paragraph 6), the greater volatility of outstandings (paragraph 8), the early thrusts (paragraphs 10 and 12). At this stage of the work these facts present, rather than unravel, puzzles. Both the facts and puzzles will be stored away for future use.