7. Stocks and Adjacent Flows, Department Stores

Patterns in the behavior of stock on hand and on order, and more particularly in rates of change in these stocks, carry implications which bear on how demand for final products is passed back to earlier stages of the production process. Does the behavior of stocks, generated by the selling, processing, and procurement problems of businessmen, cause the earlier stages to receive advice of changing levels of demand earlier or later than did the producer of the final product? Is the amplitude of fluctuation increased or decreased as it moves to earlier stages, and by how much? This chapter tries to answer these questions for department stores and their suppliers, and the following chapter deals with the durable goods industries. Changes in stocks are examined in relation to the associated flows of goods at successive stages.

But in pursuing these questions, which bear primarily on the impact of inventory investment on the economy, we shall wish to keep in mind that other group of questions that ask what the data on stocks and flows can suggest about the procurement and stock-carrying problems of business firms and how they solve them.

The reservoir, department store stocks, is filled by the flow of goods received at the stockroom and drained by the flow of sales to consumers. The monthly rate of change in stocks is receipts minus sales. For outstanding orders, the bounding flows are the inlet stream of new orders placed with suppliers, net of cancellation, and the outlet is receipts at the store. For ownership they are new orders and sales. It will be instructive to view the three sets of statistics together, which is done in Chart 8. Note that at an arithmetic level the association between a change in stock and its inlet stream is predisposed to a positive parallelism; for the outlet stream, the predisposition is to an inverse parallelism.

TIMING AND CONTOURS

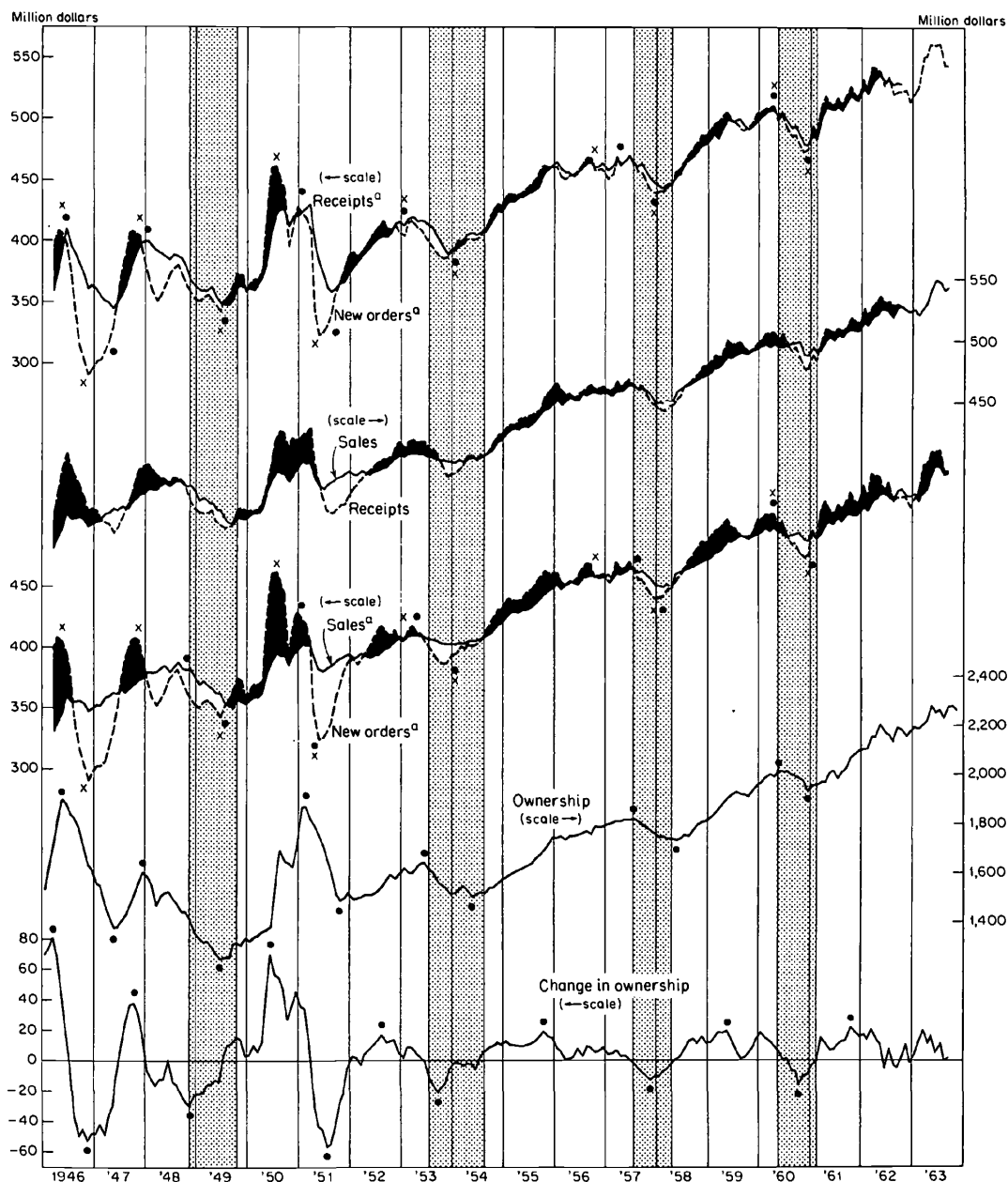### Sales, New Orders, and Ownership

The third group of curves shows the streams that bound ownership of department stores—retail sales and net new orders placed with suppliers—each smoothed by a five-month moving average. New orders systematically precede turns in general business by about half a year and show the two extra cycles (lines 10 and 11, Table 22). Sales, as noted previously, tend to lead the turns in business, though only very slightly at peaks; they shared only one of the extra cycles, the Korean one (lines 1 and 2).

Peaks and troughs in the orders that department stores place with their suppliers typically precede those in department store sales to consumers. The lead is far greater at peaks (seven months) than at troughs (one month), as line 12, Table 22, indicates. All but one comparison at peaks is a four-month or longer lead, and at troughs the longest

CHART 8

Sales, Receipts, New Orders, and Ownership, Department Stores, 1946–63

Note: Shaded areas represent business contractions. Specific turns are marked by X in new orders and by dots in sales, receipts, and ownership.

ª Five-month moving average centered; turning points are marked for underlying monthly data.

TABLE 22

Timing: Stocks and Adjacent Flows, Department Stores, 1946–62

| | | Section A: Months Lead (−) or Lag (+) for Matched Turns[a] Chronology[b] | | | | | | | | | | | |
Line	Reference Series[c]	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	Ownership	⊕	⊕	+10	+1	−1	−6	−1	−4	+1	−3	−1	+1
4	Stocks	⊕	⊕	−1	−1	−3	−13	−3	−7	+1	−6	−7	−2
		Specific Series: Receipts											
5	Business cycles			−10	−3			−6	−7	−3	−4	−1	−2
6	Subcycles	−6	−1	−10	−3	−1	−9	−6	−7	−3	−4	−1	−2
7	Sales	Ω	Ω	−9	0	0	+5	−4	0	−4	−2	0	−1
8	Outstanding orders	+2	+1	+1	+1	0	0	+3	−4	+2	−3	0	0
9	Change in stocks	+2	+1	+1	+1	+3	0	+2	+2	+16	−2	+1	0
		Specific Series: New Orders											
10	Business cycles			−12	−4			−6	−7	−9	−4	−1	−2
11	Subcycles	−8[r]	−8[r]	−12	−4	−7	−14	−6	−7	−9	−4	−1	−2
12	Sales	Ω	Ω	−11	−1	−6	0	−4	0	−10	−2	0	−1
13	Receipts	−2	−7	−2	−1	−6	−5	0	0	−6	0	0	0
14	Ownership	0	−6	−1	0	−7	−6	−5	−4	−9	−5	−1	0
15	Change ownership	+2	0	+1	+7	+1	−3	+5	+4	+12	+1	+11	+2
16	Outstanding orders	0	−6	−1	0	−6	−5	+3	−4	−4	−3	0	0
17	Change outstanding orders	+4	+2	+2	+15	+1	−1	+5	+4	+13	+3	+13	+2
18	Change stocks	0	−6	−1	0	−3	−5	+2	+2	+10	−2	+1	0
		Specific Series: New Orders, Trend Adjusted											
19	Business cycles			−12	−4			−10	−7	−20	−4	−11	−2
20	Subcycles	−8[r]	−8[r]	−12	−4	−7	−14	−10	−7	−20	−4	−11	−2
21	Change ownership	+2	0	+1	+7	+1	−3	+1	+4	+1	+1	+1	+2
22	Change outstanding orders	+4	+2	+2	+15	+1	−1	+1	+4	+2	+3	+3	+2
23	Change sales	+3	0	0	−1	+2	0	−1	+7	+10	0	+1	+1

(continued)

TABLE 22 (concluded)

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]	% Mos. 7/46− 12/61[d]

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	Ownership	6	4	0	−0.3	−2.0	−1.0	2.7	2.6	2.7	2.7	−1	80
4	Stocks	9	1	0	−2.3	−5.0	−3.0	2.1	3.6	3.0	2.9	−3	80

Specific Series: Receipts

5	Business cycles	8	0	0	−4.5	−3.5	−3.5	3.0	1.8	2.2	2.4	−3, −4	80
6	Subcycles	12	0	0	−4.5	−3.5	−3.5	2.8	2.3	2.6	2.6	−3, −4	83
7	Sales	5	1	4	−2.7	−0.3	−0.5	2.9	1.7	2.5	2.3	0, −1	81
8	Outstanding orders	2	6	4	+1.5	0	+0.5	1.0	1.5	1.4	1.2	0, +1	91
9	Change stocks	1	9	2	+2.0	+0.5	+1.0	2.8	1.0	2.1	1.9	+1	87

Specific Series: New Orders

10	Business cycles	8	0	0	−7.5	−4.0	−5.0	3.5	1.2	2.9	2.4	−4, −5	81
11	Subcycles	12	0	0	−7.5	−5.5	−7.0	2.5	3.2	2.8	2.8	−7	82
12	Sales	7	0	3	−6.7	−0.7	−1.5	3.5	0.7	3.1	2.1	−1, −2	81
13	Receipts	7	0	5	−2.0	−0.5	−1.5	2.0	2.2	2.2	2.1	−1, −2	86
14	Ownership	9	0	3	−3.0	−4.5	−4.5	3.2	2.2	2.7	2.7	−4, −5	83
15	Change ownership	1	10	1	+3.5	+1.5	+2.0	4.0	2.5	3.2	3.2	+2	79
16	Outstanding orders	7	1	4	−0.3	−3.5	−1.3	2.0	2.0	2.5	2.2	−1	84
17	Change outstanding orders	1	11	0	+4.5	+2.5	+3.5	4.0	3.2	3.8	3.6	+4	76
18	Change stocks	5	4	3	+0.5	−1.0	0	2.8	2.5	2.7	2.7	0	83

Specific Series: New Orders, Trend Adjusted

19	Business cycles	8	0	0	−11.5	−4.0	−8.5	2.8	1.2	4.5	2.0	−8, −9	73
20	Subcycles	12	0	0	−10.5	−5.5	−8.0	3.0	3.2	3.6	3.1	−8	77
21	Change ownership	1	10	1	+1.0	+1.5	+1.0	0.2	2.5	1.3	1.3	+1	91
22	Change outstanding orders	1	11	0	+2.0	+2.5	+2.0	0.8	3.2	2.0	2.0	+2	87
23	Change sales	2	6	4	+1.5	0	+0.5	2.5	1.5	2.2	2.0	0, +1	85

Notes to Table 22

^aSpecific 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.

Ω   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.

^bChronology dates are business cycle reference dates. In addition, four minor subcycle dates, enclosed in parentheses, are added to form a subcycle chronology.

^cReference 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.

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

^eMedian is the average timing of the center two or three turns.

^fAverage 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.

^gIn 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."

lead is two months. The characteristic lead is also displayed in Chart 8: the crosses mark the turns in orders and the dots those in sales. The dashed line always forms the upper boundary and the solid line the lower boundary of the blackened areas, the times when ownership is accumulating. Incidentally, the turns are marked in the series prior to the double smoothing to which the plotted lines have been subjected.

It is of special interest to note when and how the orders that retailers place with suppliers exceed their sales to consumers and vice versa. It is these crossovers that determine the direction of change in ownership. When orders exceed sales, consumer demand is in some sense augmented as it moves back to earlier stages of production; when they are less than sales, the reverse is the case. New orders, starting from a depressed level, begin to rise a bit earlier or at the same time as sales (Table 22, line 12). They soon catch up with sales and consequently ownership starts to rise (line 3). As prosperity develops, orders continue to rise and move promptly to a substantial excess over sales (the black areas in Chart 8 widen). But this does not last long without at least temporary interruption. In two cycles, the interruption was followed by a sharp drop in orders; in two others, the course of sales and orders was roughly parallel for a while. Before business expansion or consumer buying nears its peak, new orders start to recede from their currently high level. Their peaks lead those of sales by seven months, on the average (line 12). By

the time sales begin to decline, new orders have been cut to the level of sales. As a result, ownership declines; and note please it does so within just one month of the peak of sales on all but one occasion (line 3). New orders then move rapidly to substantial deficiency early in recession.

The extent to which new orders placed with suppliers exceed or fall short of sales to consumers is a measure of the whip that backward transmission of demand generates. It is depicted by the width of the shaded or white areas that separate orders from sales. These differences, by definition the rate of change in ownership, are plotted up and down from the zero line and on a larger scale (bottom curve).[1] They are, of course, and the chart brings this out, heavily affected by the shapes of the banks in new orders and sales, as well as by their timing at turns. More particularly, since sales move serenely and new orders with far more agitation, the difference between the two series tends to parallel new orders. It therefore persistently leads sales, and also tends to lead new orders. Line 15 of Table 22 shows that change in ownership leads those of new orders at every turn but two. The average lead is 3.5 months at peaks in new orders and a bit less at troughs.

The time when the orders received by suppliers of department stores reach their peak and start to decline has important bearing on the process of cyclical fluctuation. Accordingly, it is interesting to know whether these turns, which are not, as we have seen, regularly or closely associated with sales are associated with changes in one or more of the stock series. Lines 15, 17, and 18 of the table show that changes in stock on hand seem to have the most systematic relationship; 83 per cent of the months are in like phase on a synchronous basis. But apparently the picture is confused

[1] In addition to the difference in scale, some lack of precise correspondence is due to the fact that new orders and sales, as shown in the interlaced curves, have been smoothed by a five-month moving average. Differences in seasonal corrections may also account for minor variations.

by the upward trend in new orders associated, no doubt, with the upward trend in sales. Abstracting from this trend,[2] change in ownership (leading one month) and new orders are in phase 91 per cent of the months (line 21). The peaks in new orders occur almost precisely one month after those in change in ownership as recorded by a five-month centered average for end-of-month data. It would be synchronous with such an average based on beginning-month data.

Stocks and Outstandings and Their Bounding Flows

The relation between buying by retailers and buying by consumers, which results in changes in ownership, needs to be viewed in two segments: the relation between buying by retailers and their receipts of the merchandise, which results in changes in outstandings, the top pair of lines in Chart 8; and the relation between the receipt of merchandise and its sales to consumers, which results in changes in stocks, the second pair of lines. Judging from the top set of curves, new orders placed by retailers start to exceed current receipts of merchandise in the middle or last quarter of recessions; the excess begins to reverse after about a year of business expansion has passed. This is simply another way of calling attention to the early turns and brief thrusts of expansion in outstanding orders. The second set of curves shows that receipts start somewhat more tardily to exceed consumer buying— more nearly as contraction ends—and the excess persists well into the following contraction. The two sets of comparisons taken together seem to show how the bulge of excess procurement squeezes along in time. It starts in outstanding orders, moves to desired stocks, and ends, as expansion terminates (and here we interpolate possible motive), in undesired stock accumulations.

[2] A straight line was fitted visually on semilogarithmic paper. The trend is thus that of a uniform rate of change.

As in the case of change in ownership and the inlet stream, new orders, change in stock on hand likewise has a close timing association with its inlet stream, receipts. Looked at the other way, the turns in receipts reflect those of inventory investment one or two months earlier. Eighty-seven per cent of the months are in like phase after allowing for a one-month lead, but the figure does not do credit to the closeness of the association because of one very long lead (Table 22, line 9). All turns are matched, and of the twelve comparisons ten are within two months of one another.

Change in outstanding orders leads new orders, its inlet stream, quite substantially and does not have a close association with it (line 17). A trend correction for new orders, however, improves the association if a two-month lead is allowed for; 87 per cent of the months are then in like phase (line 22). Change in outstanding orders and receipts, its outlet stream, is predisposed to inverse association, but this is still poorer than is its direct association with new orders.

However, one interesting relation between outstandings and receipts does exist. It is between outstandings proper and receipts. Line 8 shows that 91 per cent of the months are in like phase either on a synchronous basis or with outstandings leading one month. This could perhaps reflect a vestibule effect. But there is another explanation that will be suggested later.

I do not know just what conclusions to draw from these relations between change in stocks and their inflow streams. If the trend adjustment is accepted as appropriate, they are close; change in stock and receipts are close in any event.[3] Of course, at a causal level, the similarities between the inflow series and the change in reservoirs for which sales are the outflow could, as noted earlier, express nothing more than an arithmetic of frenetic orders and relatively smooth sales.

But in any event it has further implication. We have seen that if new orders fluctuate, so will the rates of change in ownership. But consider the converse of this fact: retailers for whatever reason wish to increase or decrease a rate of change in stocks on hand, or the volume of goods on order. The orders they place with their suppliers tend to show an absolute increase or decrease, even if sales to consumers do not. A change in these sales orders received by retailers' suppliers may well influence their production schedules and perhaps communicate to the next stage, that of suppliers' suppliers.

AMPLITUDE

New orders placed by retailers are obviously far more cyclically unstable than are retail sales, the orders placed by consumers. This means that cyclical instability generates within the process whereby retailers decide how much to buy, given the amount that they sell. It is desirable to learn the quantitative importance of the amplification. But how can it be measured?

For the period 1946–61, the average specific cycle amplitude of retailers' orders was a rise or fall per month of ±1.38 per cent of the

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[3] The trend adjustment here raises the question whether it ought not to be used for other comparisons. However, it is interesting that the trend adjustment has much stronger influence on the timing of peaks in new orders than in sales or receipts. The reason is doubtless the tendency for new orders to rise heavily in the early stages of expansion; further rise is therefore frequently supported chiefly by the trend increase. For sales the trend adjustment would reveal flat tops, but whether the dates of turns would change depends on the subtleties of the trend adjustment. For receipts, only the turn associated with the 1957 cycle peak would clearly be changed by a trend adjustment. Making the changes leaves change in stock in phase with receipts 93 per cent of the months after allowing for a one-month lag of receipt.

These facts have the provocative corollary that if trend adjustment had been made for all series, new orders would have had a stronger lead relative to sales and to receipts than now appears.

TABLE 23

Average Cycle Amplitude of Sales, Orders, and Receipts,
Department Stores, Cycle Relatives,[a] 1946-60

	Date of First and Last Peak or Trough (1)	Total Per Phase			Per Month[b]		
		Rises (2)	Falls (3)	Both[c] (4)	Rises (5)	Falls (6)	Both[c] (7)
		Specific Cycles					
1. Sales	7/49 to 1/61	13.0	−5.5	9.2	.46	−.84	.54
2. Receipts	6/47 to 12/60	18.4	−12.6	15.5	.85	−1.16	.96
3. New orders	10/46 to 12/60	28.3	−18.9	23.5	1.31	−1.52	1.38
		Reference Cycles					
4. Sales	10/49 to 2/61	11.5	−.4	6.0	.33	−.04	.26
5. Receipts	10/49 to 2/61	11.9	−1.9	6.9	.34	−.18	.30
6. New orders	10/49 to 2/61	9.2	1.1	4.1	.26	.10	.18

[a]Source: Standard National Bureau business cycle analyses. Cycle relatives are amplitudes expressed as a percentage of the average standing of the series during each cycle.

[b]The averages are the sum of all rises (or falls) divided by the sum of all months of rising (or falling) phase.

[c]Sum of conforming minus nonconforming amplitude divided by the number of phases (column 4) or by the number of months from the initial to terminal turn (column 7).

average level of orders. The corresponding figure for sales was ±.54 per cent. Table 23 gives the figures in the last column. Thus sales were about 40 per cent as unstable as orders. The rate of change in ownership was somehow involved in this difference, but the arithmetic of the involvement is ambiguous unless orders and sales are compared for identical dates. Then, for each interval, the rise (or fall) in new orders is equal to the rise (or fall) in retail sales plus the positive (or negative) increase in the rate of change in ownership.[4] Table 24 summarizes various ways of marking off intervals that seem meaningful in the context of the process of vertical transmission of fluctuations. Subsequent tables indicate how the calculations were made. It has been convenient for this purpose to work with

[4] This may be an increase in a positive rate, a decrease in a negative rate, or the algebraic sum of a positive rate minus a negative rate.

dollar figures rather than with the cycle relatives. Specific cycle amplitudes averaged $1.75 million for sales and $3.53 million for orders (line 1, columns 9 and 10)—just about twice as much as sales (column 12).

One way to mark off significant periods is by a chronology of peaks and troughs of major business fluctuation. During this standard reference scheme, new orders rose and fell less on the average than did retail sales, ±$.88 million per month on the average compared with ±$1.35 million for retail sales, Table 24, line 2. The reason is that new orders turn early and therefore have lost altitude by the time the business peak occurs, and have gained it by the time the trough occurs.

Our notions of cyclical fluctuations and their chronology focus on the major economic activity of the nation. New orders anticipate activity and therefore exert their inflence in a cycle that casts its shadow before. The third

TABLE 24

Average Monthly Amplitude of Sales and Orders During Variously Selected Periods, Department Stores, 1947-61

Basis of Defining Phase	Rise During Expansion Phases[a]				Fall During Contraction Phases[a]				Rise or Fall, All Phases[a]			
	$ Millions per Month		Sales as % of Orders	Orders as % of Sales	$ Millions per Month		Sales as % of Orders	Orders as % of Sales	$ Millions per Month		Sales as % of Orders	Orders as % of Sales
	Sales	Orders			Sales	Orders			Sales	Orders		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1. Specific cycles in each series	1.60	3.33	48	208	2.38	3.87	61	163	1.75	3.53	50	202
2. Reference cycles	1.46	1.24	118	85	1.10	0			1.35	.88	153	65
3. Reference cycles with 6-months lead	1.20	1.44	83	120	.40	.67	60	165	.97	1.22	80	125
4. Periods of thrust[b]	1.59	2.87	55	180								
5. Specific cycles in orders	1.63	3.33	49	204	.49	3.87	13	790	1.21	3.53	34	291
6. Selected periods of accelerating rise or fall in ownership[c]	2.54	5.83	44	230	1.50	5.50	27	367	2.37	5.78	41	244

[a] Amplitudes are based on standings calculated as five-month averages centered on first and last month of each phase. Averages are the sum of the rises during expansion phases (falls during contraction phases) divided by the number of months in all expansion (contraction) phases.

[b] "Periods of thrust" begin six months before business cycle troughs and continue to the first subcycle peak or hesitation. See Table 25.

[c] From Table 26. Expansion phases starting in the neighborhood of each business cycle trough; contraction phases starting in the neighborhood of each business cycle peak; 41 months of three expansion phases and 8 months of two contraction phases.

line of Table 24 assumes that the shadow is six months long and compares the amplitude of sales and new orders using this uniformly predated business cycle chronology. The monthly amplitude of orders is now somewhat greater than that of sales for each cycle, and it averages 125 per cent of it; that is, the orders received by suppliers add an additional whip of about 25 per cent to the average monthly fluctuation of retail sales during cycles starting or ending half a year before cyclical peaks or troughs. It is much greater during contraction (165 per cent) than during expansions (120 per cent).

But we have noted in many contexts that, characteristically, materials buying spurts during the early months of expansion and then levels off at least for a while. During these periods of first thrusts, new orders will reflect the spurts. The fourth line in the table measures the rise from six months prior to business cycle troughs to the end of the period dated (as described in earlier chapters) by using the minor turns of a subcycle chronology and adding two extra dates which seem to represent some general hesitation in business prosperity. During these periods, orders placed by department stores rose 180 per cent of the rise of their sales (Table 24, line 4, column 4). The details of how this figure is arrived at are presented in Table 25, and in columns 4 and 5 we see that 61 of the 105 months of expansion are included in the early thrust as defined. During these periods new orders rose at the rate of $2.87 million per month, whereas sales rose by $1.59 million per month (Table 25, columns 9 and 13, or Table 24, line 4, columns 1 and 2). Though in each case the rate of rise was substantially higher than during all the months of reference expansion (lines 2 or 3, Table 24), it was particularly so for new orders. Again, then, we see the picture of the heavy influence of the inventory-purchasing syndrome early in expansion and, as indicated in the previous paragraph, during contraction. The figures suggest orders of magnitude.

Another way of defining intervals of interest is by asking what portion of the notoriously large specific cycle fluctuation in orders is a direct reflection of contemporaneous fluctuation in consumer buying; the rest, by definition, is associated with change in ownership. Line 5 of Table 24 gives the summary figures which are shown cycle by cycle in Table 26. Department store orders rose or fell by $3.53 million per month on the average during their specific cycle phases. Between the identical calendar dates, retail sales rose or fell on the average by $1.21 million per month (Table 26, columns 6 and 7, bottom line, or Table 24, columns 9 and 10, line 5). Thus, of the total specific fluctuation in orders, 34 per cent directly reflected fluctuation in consumer buying and the rest, 66 per cent, fluctuation in the rate of change in ownership. In other words, the whip in new orders was almost three times that of sales (291 per cent), Table 26, column 8, bottom line. The other figures in columns 6 to 8 make a further suggestion: the whip for both expansion and contraction decreased over the interwar years that have been examined. The figures seem to indicate that most of the notable instability of new orders is a direct reflection not of contemporaneous instability in sales to the final consumer but of a tendency for retailers' buying to be either greater or less than their sales.

It would be useful to know how sellers and buyers respond to the associated changes in ownership. It seems inevitable that when there is a thirst for goods, reflected in a rise of ownership and at an accelerating rate, this would express and convey optimistic expectations. Corresponding remarks apply to the pessimistic implications of decline at an accelerating rate. Whether this is also the case after the rise or fall in ownership has slackened is perhaps more doubtful. Of particular interest are the months close to business cycle troughs when ownership starts to rise at an accelerating rate, or close to business cycle peaks when ownership starts to decline at an accelerating rate. At these times, the

TABLE 25

Amplitude During Reference Cycle Phases Predated Six Months and Periods of First Subcycle Expansion Sales and New Orders, Department Stores, 1946-62

Reference Dates, Predated Six Months		Interval (months) Trough to:			Rise or Fall (−) ($ millions)[b]				Rise or Fall (−) ($ millions)[b]				New Orders As % of Sales	
					Total Phase		Per Month		Total Phase		Per Month			
		Sub peak[a]	Peak	Sub-peak	Cycle	Sub	Cycle (6÷4)	Sub (7÷5)	Cycle	Sub	Cycle	Sub	Cycle (10÷6)	Sub (11÷7)
Trough	Peak													
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
						Expansions								
4/49	1/53	2/51	45	22	38	33	0.84	1.50	52	67	1.16	3.05	136.8	203.0
2/54	1/57	12/55	35	22	56	46	1.60	2.09	52	61	1.49	2.77	92.9	132.6
10/57	11/59	3/59	25	17	32	18	1.28	1.06	47	47	1.88	2.76	146.9	261.1
Total			105	61	126	97			151	175				
Average[c]					42	32	1.20	1.59	50	58	1.44	2.87	119.8	180.4
						Contractions								
5/48	4/49		11		−17		−1.55		−10		−0.91		58.8	
1/53	2/54		13		−2		−0.15		−4		−0.31		200.0	
1/57	10/57		9		1		0.11		−3		−0.33		−300.0	
11/59	8/60		9		1		0.11		−11		−1.22		−1,100.0	
Total			42		−17				−28					
Average[c]					−4		−0.40		−7		−0.67		164.7	
						All Phases								
Total			147		143				179					
Average					20		±0.97		25		±1.22		125.2	

[a]For selection of dates see text.

[b]Standings are five-month averages of the data centered at the month of turn. Rises are standings at peak minus standings at previous trough; falls are standings at trough minus standings at previous peak.

[c]Total rise during expansion phases (falls during contraction phases) divided by the number of phases covered for average of phase amplitude (cols. 6, 7, 10, 11) and by number of months covered for average per month amplitude (cols. 8, 9, 12, 13).

general business climate would presumably be sensitive to whatever impact this set of influences might wield.

Table 27 puts the question to the data. The accelerating rises in ownership started close to business cycle troughs (note that most of the period of rise followed the cycle trough, column 5); they lasted twelve to sixteen months (column 3); unrelated episodes are in parenthesis. Accelerated decline likewise started virtually at the peaks but lasted only a few months, two to five (lower half of Table 27, columns 3-5). During the 41 months of accelerating rise in ownership, the rate of in-

TABLE 26

Amplitude of Sales and New Orders During Specific Cycles
of New Orders, Department Stores, 1946-60

Dates, Expansion in Orders		Interval (months)	Rise ($ millions)[a]				Total Phase
			Total Phase		Per Month		Orders as % of Sales
Trough	Peak		Sales	Orders	Sales	Orders	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Expansions							
11/46[b]	10/47[b]	11	23	117	2.09	10.64	509
6/49	7/50	13	32	120	2.46	9.23	375
4/51	1/53	21	18	61	0.86	2.90	339
1/54	10/56	33	57	64	1.73	1.94	112
12/57	4/60	28	48	71	1.71	2.54	148
Total 10/47–4/60		95	155	316			
Average[c]			39	79	1.63	3.33	204[d]

Dates, Contraction in Orders		Interval (months)	Fall ($ millions)[a]				Total Phase
			Total Phase		Per Month		Orders as % of Sales
Peak	Trough		Sales	Orders	Sales	Orders	
(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Contractions							
5/46[b]	11/46[b]	6	2	-115	0.33	-19.17	-5,750
10/47	6/49	20	-8	-66	-0.40	-3.30	825
7/50	4/51	9	-7	-118	-0.78	-13.11	1,686
1/53	1/54	12	-4	-10	-0.33	-0.83	250
10/56	12/57	14	-8	-19	-0.57	-1.36	200
Total 10/47–4/60		55	-27	-213			
Average			-7	-53	-0.49	-3.87	789[d]
All Phases							
Total 10/47–4/60		150	182	529			
Average[c]			23	66	1.21	3.53	291[d]

[a]Five-month average centered at the month of peak minus five-month average centered at the month of trough. Thus rises have a positive and falls a negative sign.

[b]To make these calculations comparable with others in the series, these phases are omitted from the averages.

[c]Averages are total rise or fall divided by number of phases or total number of months.

[d]Average per phase for orders divided by sales.

TABLE 27

Amplitude of Sales and Orders During Selected Periods of Accelerating Rise or Fall in Ownership, Department Stores, 1947-61

		Duration (months)			Sales Change ($ millions)[b]		New Orders Change ($ millions)[b]		Change: Orders as % of Sales
			Relation to B.C. Trough[a]			Per Mo.		Per Mo.	
Start	End	Total	Before	After	Total	(6÷3)	Total	(8÷3)	(8÷6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

Periods of Accelerating Rise

Start	End	Total	Before	After	Total	Per Mo. (6÷3)	Total	Per Mo. (8÷3)	(8÷6)
(6/47)[d]	(10/47)	(4)	⊕	⊕	(+9)	(+2.25)	(+57)	(+14.25)	(633.3)
6/49	6/50	12	4	8	+25	+2.08	+120	+10.00	480.0
(11/51)	(8/52)	(9)	⊕	⊕	(+5)	(+0.56)	(+40)	(+4.44)	(800.0)
6/54	10/55	16	2	14	+40	+2.50	+61	+3.81	152.5
4/58	5/59	13	0	13	+39	+3.00	+58	+4.46	148.7
Total, Selected Periods[c]		41			+104		+239		
Average[d]					+35	+2.54	+80	+5.83	229.8

Periods of Accelerating Fall

Start	End	Total	Before	After	Total	Per Mo.	Total	Per Mo.	(8÷6)
			Relation to B.C. Peak[e]						
		Total	Before	After					
(12/47)	(11/48)	(11)	(11)	(0)	(+6)	(+0.55)	(-32)	(-2.91)	(-533.3)
(3/51)	(7/51)	(4)	⊕	⊕	(-18)	(-4.50)	(-75)	(-18.75)	(-416.7)
6/53	9/53	3	1	2	-3	-1.00	-16	-5.33	-533.3
6/57	11/57	5	1	4	-9	-1.80	-28	-5.60	-311.1
Total, Selected Periods[c]		8			-12		-44		
Average[d]					-6	-1.50	-22	-5.50	-366.7

Periods of Rise And Fall

		Total			Total	Per Mo.	Total	Per Mo.	(8÷6)
Total, Selected Periods		49			116	2.37	283		
Average[d]					23	2.37	57	5.78	244.0

[a]The interval (column 3) is broken into the segments preceding and following the associated business cycle trough dates. The starting dates of the period (as per column 1) and the cycle trough dates, respectively, are: 6/49, 10/49, 6/54, 8/54; 4/58, 4/58.

[b]Five-month average centered at the month of peak minus five-month average centered at the month of trough. Thus rises have a positive and falls a negative sign.

[c]Selected for inclusion are those periods of rise that start close to business cycle troughs and those periods of fall that start close to business cycle peaks. Episodes for which figures are enclosed in parentheses do not conform to this principle. They are not included in the totals or averages but are shown for the purpose of comparison (contraction 12/47 to 11/48 was excluded because it was too early to be conforming).

[d]Averages are total rise or fall divided by number of phases or number of months.

[e]The total interval is broken into the segments preceding and following the associated business cycle peak dates. The starting dates of the period (as per column 1) and the cycle peak dates, respectively, are: 12/47, 11/48; 6/53, 7/53; 6/57, 7/57.

crease in new orders was exceedingly high, $5.83 million per month, much higher, of course, than for the whole stretch of specific cycles in new orders which averaged $3.53 million per month (Table 24, line 1). For retail sales the corresponding figures were far lower, $2.54 million, which was nevertheless much faster than the average specific cycle amplitude of $1.75 million per month (Table 24, line 1).

For these periods, then, which last for about a year after business troughs, and which also on occasions have given a second thrust later in expansion, orders shot way ahead of sales, though sales themselves were rising relatively swiftly. The average whip was 230 per cent. Reversing the comparison (Table 24, line 6, col. 3), 44 per cent of the fluctuation in new orders during these periods is directly associated with current sales. Accordingly, 56 per cent was associated with the rate of change in ownership and therefore in some sense a reflection of the inventory-purchasing complex.

SUMMARY

In conclusion, it seems clear that changes in stockpiles are strongly reflected in the contours of the stream that feeds them. This appears in the similarity of the timing of turns and the slight leads that change in stock tends to have. But the more significant manifestation, from the point of view of the impact of the "inventory cycle" on economic events, is the large increase in amplitude that occurs. Clearly retailers' stocking and procurement procedures amplify fluctuation in final demand as it moves toward their suppliers.

There is no single answer to how much amplification takes place. Perhaps the simplest measurement compares the intrinsic fluctuations in retailers' selling and buying; that of buying is over twice as large. But the strong lead in orders placed by retailers, relative to their sales to final consumers, means that the whip effect precedes the turns in business. Characteristically the time when the backward fillip to demand generated by buying procedures is greatest started close to the trough in business and continued for about a year. The depressant influence was greatest during months close to business cycle peaks and for a while thereafter. During these periods new orders placed with suppliers rose or fell almost two and a half times as rapidly as sales to consumers.