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CHAPTER 7

FLUCTUATIONS TRANSMITTED AND INITIATED BY SHOE DISTRIBUTORS

We turn from a study of the buying of consumers to that of the enterprises that sell to them—shoe retailers. Unfortunately, we have little quantitative information about retailers' purchasing of shoes, and what we do have is of poor quality. Consequently, it is necessary to explore by a roundabout method how demand of the final consumer is transmitted and perhaps transformed through the buying patterns of retail stores. Failing statistics on retailers' purchases, the investigation is anchored to data on shoe production, for which an excellent monthly record is available. These data not only give the number of finished shoes that issue each month from the finishing rooms of the country's shoe factories but also carry implicit information about orders placed by distributors, since most shoes are produced in response to a confirmed order. We start with an examination of the relation between retail sales and the production of shoes and the consequent patterns of inventory investment in finished footwear in all hands.

Relation between Sales, Production, and Inventory Investment

MAJOR OUTLINES

Chart 15 displays the number of pairs of shoes produced and destined for domestic consumption. On the same axis appear also our estimates of the number of pairs of shoes sold to consumers; they are obtained by dividing retail sales of shoes in dollars by the average price paid per pair sold each month. This operation gives estimates of retail sales that, theoretically, are directly comparable with the information on production as it comes in to the Bureau of the Census in monthly reports from the vast majority of the shoe manufacturers of the country. When sales are above production for a given month, the number of finished shoes held as inventories by producers or distributors must have decreased between the beginning and the end of the month; when sales are below production, stocks must have increased. By subtracting sales from production, estimates of month-to-month change in stock (inventory investment) are obtained. Note that month-to-month change, first differences in stock, and inventory investment are used throughout as synonyms; each typically refers to physical changes, or to the value of physical changes, and not to monetary investment as such.

What does the chart say? Its first statement is familiar. Fluctuations in consumer buying are accompanied by fluctuations in the flow of the finished commodity out of the factories of the country. With the exception of the peak and trough in retail sales corresponding to the business-cycle turns in 1926 and 1927, shoe production has all the subcycle turns, and only those turns, that were found in shoes at retail.[1] Second, the chart shows that these shared movements tend to occur at about the same time: of the 22 matched turns, 15 occur no more than 2 months apart. When compared with sales, production leads, on the average, by 0.8 month; there are 13 leads, 7 lags, and 2 synchronous turns. But the series show only moderate parallelism in the monthly course of their subcyclical fluctuations: average deviation for timing at turns is 2.0 months, and 29 per cent of all months are in unlike phase after an allowance for a 1-month lead.[2] Third, fluctuations are wider in production than in retail sales; this can be seen in virtually each movement. Fourth, the similar timing and wider amplitude mean that as production increases, more shoes are produced than are sold; and as production declines, the reverse is true. Of necessity, then, inventory investment increases during recoveries and recedes during recessions. These subcyclical fluctuations in inventory investment may be seen, in Chart 15, to duplicate, with very few exceptions, the fluctuations in production.

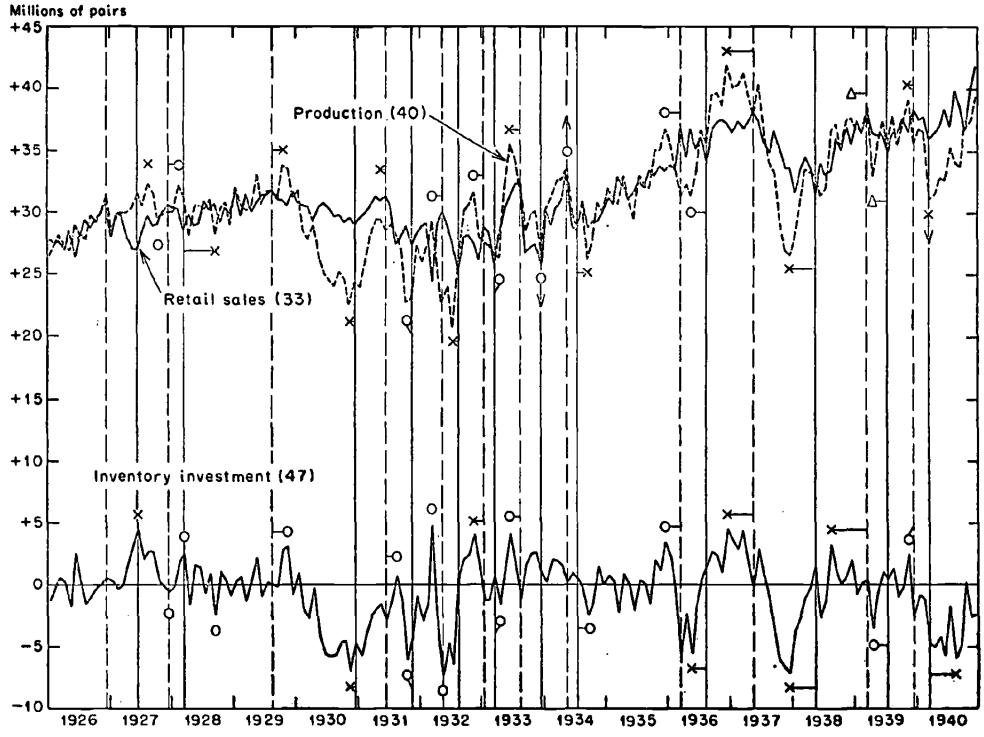
Estimates of inventory investment obtained by subtracting sales from production are subject to the usual

[1] Even the omission of the 1926-to-1927 retardation and its location as a very short movement in the middle of 1927 is a function of the seasonal correction. When production is corrected by the simple ratio-to-moving-averages method without the moving adjustment used in the final series, a peak was marked in September 1926 and a trough in May 1927. Table 31 in the next chapter and the associated discussion suggest that it is questionable whether the moving seasonal correction should have been made.

[2] When compared synchronously, 31 per cent are in unlike phase.

CHART 15

Retail Sales, Production, and Inventory Investment in Shoes, 1926–1940



Specific-subcycle peaks and troughs (broken and solid vertical lines) in *pair shoe sales* (series 33 in Appendix B) are used as reference frame.
For the other series, specific-cycle turns are marked by ×, specific-subcycle turns by O, and retardations by △. When a specific turn is matched with a turn in the reference series, a horizontal line or vertical arrow indicates the association.
Parenthetic figures after names of series identify their description in Appendix B.

frailties of a series of this sort: relatively minor malformations in either or both of the parent series can cause serious deformities in the offspring. Accordingly, in an effort to arrive at an independent estimate of commercial stocks of finished shoes, an index of distributors' stocks was constructed from two series. First, from information submitted to the Federal Reserve System by department stores, an index of stocks of shoe departments was computed; unfortunately there are even fewer stores submitting information on stocks than on sales and this is all the information available, 1926–1940, on the shoe stocks of retailers—perhaps three-quarters or even four-fifths of the total stock of finished shoes. Second, stocks of shoe wholesalers are recorded; though here again, the sample submitting information on stocks is smaller than on sales. For stocks held by manufacturers, which may be as large as those of wholesalers, no time series is available.[8]

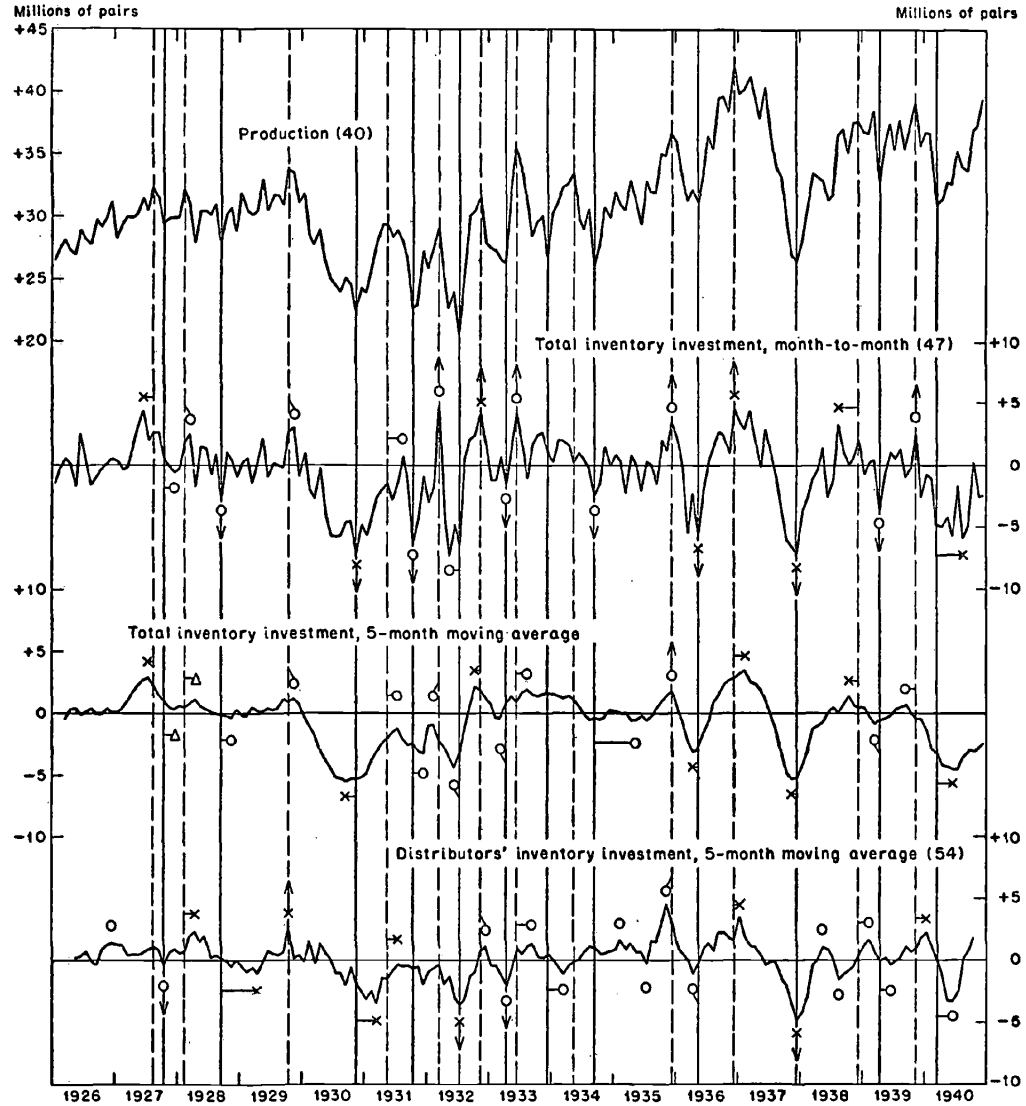
Chart 16 displays the estimates of distributors' stocks. They may be viewed as rough independent estimates of all stocks of finished shoes. For comparison, the chart shows the estimates obtained by subtracting retail sales from production. Shoe production is at the top, and the vertical grid marks its specific peaks and troughs. The strong influence of fluctuation in production on the derived estimates of total stocks may be seen with great clarity. But it is reassuring to find that this influence is not merely a function of the method of calculating stocks, for most of the same fluctuations appear in the figures obtained from department stores and wholesalers. On the basis of both stock series, the chart shows that a large part of the subcyclical fluctuations in production of shoes is associated with parallel fluctuations in investment by

[8] I estimate that between 1925 and 1940, retailers held 78 per cent of stocks of finished shoes, wholesalers (including manufacturer-owned wholesalers in separate establishments) held 11 per cent, and manufacturers held 11 per cent (see description of distributors' stocks, Appendix B, series 54).

There is no way of arriving at adequate monthly estimates of manufacturers' stocks since monthly change in these stocks cannot be assumed to parallel shoe stocks of wholesalers and there is every reason to assume that it will differ from stocks of retailers.

CHART 16

Two Estimates of Inventory Investment in Shoes, 1926–1940



Specific-subcycle peaks and troughs (broken and solid vertical lines) in *shoe production* (series 40 in Appendix B) are used as reference frame. For the other series, specific-cycle turns are marked by ×, specific-subcycle turns by O, and retardations by △.
The moving averages are centered and are of month-to-month change.

businessmen in inventories of finished shoes rather than with fluctuations in consumer demand.

How large a part of production was thus channeled into inventory investment or disinvestment? Table 26 gives the necessary measures. The subcycle peaks and troughs in the production of shoes are used as a reference frame to record the fall from peak to trough and rise from trough to peak for production, for retail sales, and for both estimates of inventory investment. The table helps to evaluate the relation between the derived and independent estimates of inventory investment. When the derived estimates of inventory investment are summarized in a fashion exactly equivalent to that for the summaries of the data for retail sales and production, inventory investment accounts for over three-quarters (last line) of the subcyclical variability of production. But this statistic was rejected because of distrust of the derived method of computation and because the method is sure to emphasize erratic elements in the data to which the amplitude measures are very sensitive. When in the next column the erratic aspects are subdued by recording standings as five-month averages, the amplitude is considerably reduced, though it is still larger than that of retail

TABLE 26

Amplitude of Fluctuation in Retail Shoe Sales and Inventory Investment in Shoes during Each Subcyclical Phase in Shoe Production, 1926–1940

(*conforming* (+) *or nonconforming* (−) *amplitude in millions of pairs per reference phase*) [a]

REFERENCE FRAME: SUBCYCLES IN PRODUCTION			PRODUCTION	RETAIL SALES	TOTAL INVESTMENT	INVENTORY INVESTMENT			
			(*standings are 3-month averages*) [b]			*Total*	*Distributors'*	*Retailers'*	*Wholesalers'*
						(*standings are 5-month averages*) [c]			
Peak	*Trough*	*Peak*	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Aug. 1927	Oct. 1927		2.6 [d]	0.1 [d]	2.5 [d]	1.4	1.4	1.2	0.2
	Oct. 1927	Feb. 1928	1.4	0.1	1.3	−0.6	1.1	0.8	0.2
Feb. 1928	Sept. 1928		1.3	−0.3	1.6	0.6	0.6	0.2	0.4
	Sept. 1928	Oct. 1929	2.9	0.8	2.1	1.2	2.3	1.6	0.6
Oct. 1929	Nov. 1930		8.9	1.5	7.4	6.3	4.3	3.2	1.1
	Nov. 1930	July 1931	4.7	0.4	4.3	4.1	1.6	0.5	1.1
July 1931	Oct. 1931		4.3	1.6	2.7	1.1	0.4	−0.2	0.6
	Oct. 1931	Mar. 1932	3.1	−0.5	3.6	0.2	0.3	0.2	0.1
Mar. 1932	July 1932		3.7	0.4	3.3	0.9	3.1	3.0	0.1
	July 1932	Nov. 1932	6.4	0.1	6.3	5.0	4.3	3.3	1.0
Nov. 1932	Apr. 1933		3.6 [e]	0.4 [e]	3.2 [e]	1.1	2.9	2.0	0.9
	Apr. 1933	June 1933	7.4 [f]	4.4 [f]	3.0 [f]	0.3	3.1	3.2	−0.1
June 1933	Dec. 1933		4.8	3.5	1.3	−0.7	0.5	1.4	−0.9
	Dec. 1933	May 1934	2.9	3.2	−0.3	−0.6	−0.6	−1.2	0.6
May 1934	Sept. 1934		3.8	1.4	2.4	1.5	−1.1	−2.3	1.2
	Sept. 1934	Dec. 1935	7.7	4.0	3.7	2.2	2.1	1.2	0.9
Dec. 1935	May 1936		3.7	−1.9	5.6	4.8	3.4	2.1	1.2
	May 1936	Dec. 1936	7.9	1.6	6.3	5.9	2.0	1.4	0.5
Dec. 1936	Dec. 1937		12.9	4.1	8.8	8.1	6.5	5.6	0.9
	Dec. 1937	Nov. 1939	10.2	4.5	5.7	4.8	5.8	5.1	0.7
Nov. 1939	Apr. 1940		5.6	1.0	4.6	3.8	2.2	2.3	−0.1
Aggregate for all twenty-one phases			109.8	30.4	79.4	51.4	46.2	34.6	11.2

[a] A series is said to conform to the reference phase when it rises between the initial and terminal reference dates of an expansion and falls during a contraction (see Appendix A, secs. 12 and 13). Descriptions of the series will be found in Appendix B: production 40; retail sales 33; inventory investment: total 47; distributors', retailers', and wholesalers', all 54.

[b] Peak and trough standings from which phase amplitude was computed are centered three-month averages, with isolated exceptions as stipulated in notes d through g. The amplitude of production is the sum of that of retail sales and of total inventory investment.

[c] Peak and trough standings from which phase amplitude was computed are centered five-month averages because of the erratic character of the data.

[d] Based on August 1927 and a two-month average in October 1927 because of the erratic movement in production at these dates.

[e] Based on a three-month average in November 1932 and a two-month average in April 1933 because of the erratic movement in production in April 1933.

[f] Based on a two-month average in April 1933 and a three-month average in June 1933 because of the erratic movement in production in April 1933.

sales. The independent estimates, likewise smoothed by a five-month average, also assert that investment plays a somewhat larger part than fluctuations in sales to consumers in the subcyclical amplitude of shoe output, and this statement commands more respect.[4]

Though phase-by-phase relationships between retail sales and inventory investment vary widely, investment is more important than sales in fifteen of the twenty-one phases. I conclude that inventory investment plays at least as important a part as sales in the agitation of the flow of shoes from factories.[5]

The question arises whether the relative importance of retail sales and inventory investment in accounting for fluctuation in output is the same regardless of the type of movement that is under way. Abramovitz found that changes in inventory investment constituted a more important part of total fluctuations of gross national product in short than in long business cycles.[6]

[4] The table reinforces the visual impression that the derived and independent estimates are not too dissimilar. If ranks are assigned to the phase amplitudes for the two estimates of inventory investment (cols. 3 and 4), the rank correlation is 0.63. At the same time, study by means of Chart 16 of several of the movements for which amplitudes for the two estimates are notably different suggests that the difference is due to a few extreme months rather than to the general profile of the movement.

[5] It seems wise to phrase conclusions conservatively because of the sensitivity of the measures to the degree to which the series are erratic and the fact that manufacturers' stocks are not included in the independent estimates. These stocks are more likely to have an inverse than a direct association with output so that their inclusion might damp the fluctuation in inventory investment slightly.

[6] Moses Abramovitz, *Inventories and Business Cycles, with Special Reference to Manufacturers' Inventories*, National Bureau of Economic Research, 1950.

Is an analogous difference to be found here? In Table 27 the amplitude of fluctuations in retail sales and in inventory investment during specific fluctuations in shoe production is classified by type and duration of the movement; average amplitudes per phase and per month are shown.[7] Ratios (lines 7, 10, and 13) compare the contribution of inventory investment and of retail sales to fluctuation in production. Ratios of over 1 mean that investment is the more important. The extent of its importance vis-à-vis consumer demand is inversely associated with the length of the phase. In judging the character of the relationship, major reliance must be placed on the series for inventory investment of distributors, the monthly amplitude of which (line 9) may be compared with that of sales (line 4).

For the broad swings in shoe output (column 1) associated with the major cycles in the industry, inventory investment shares equally the responsibility for fluctuations in shoe production (note the ratio of almost 1.0 in line 10). If any other fluctuation in production designated as a cycle rather than a subcycle is included (column 2), the relative importance of investment in shoe stocks increases somewhat, whereas when all subcycles are included (column 3),

[7] Table 26 is in effect one of the work sheets for Table 27; it applies to the third column—all subcycles. Thus total amplitude of, say, retail sales given in the last line of Table 26 (30.4 million pairs) is divided first by the number of phases (21) and then by the number of months (152) to give the statistics for retail sales in Table 27, lines 3 and 4.

TABLE 27

Average Amplitude of Fluctuation in Retail Sales and Inventory Investment during Specified Types of Fluctuations in Shoe Production, 1926–1940 [a]

		TYPES OF FLUCTUATION IN SHOE PRODUCTION USED AS REFERENCE FRAME:				
		Cycles Associated with SLH Reference Cycles (1)	*All Cycles* (2)	*All Subcycles* (3)	*Subcycles of Six Months and Over* (4)	*Subcycles of Under Six Months* (5)
	Phases covered:					
1.	Number	3	11	21	9	12
2.	Average duration, months	32.7	13.8	7.2	11.6	4.0
	Average net conforming amplitude, millions of pairs:					
	Retail sales [b]					
3.	Per phase [c]	5.9	2.5	1.4	2.2	0.9
4.	Per month	0.18	0.18	0.20	0.19	0.21
	Inventory investment [d]					
	Total					
5.	Per phase [c]	6.1	3.8	2.4	3.6	1.6
6.	Per month	0.19	0.27	0.34	0.31	0.39
7.	Ratio to retail sales [e]	1.03	1.49	1.69	1.62	1.83
	Distributors'					
8.	Per phase [c]	5.9	2.9	2.2	2.9	1.7
9.	Per month	0.18	0.21	0.30	0.25	0.43
10.	Ratio to retail sales [e]	0.99	1.15	1.52	1.28	1.99
	Retailers'					
11.	Per phase [c]	5.2	2.5	1.6	2.2	1.2
12.	Per month	0.16	0.18	0.23	0.19	0.30
13.	Ratio to retail sales [e]	0.88	0.97	1.14	1.00	1.40
	Wholesalers'					
14.	Per phase [c]	0.7	0.5	0.5	0.6	0.5
15.	Per month	0.02	0.03	0.07	0.05	0.12
16.	Ratio to retailers' inventory investment [f]	0.14	0.18	0.32	0.26	0.41

[a] All series are identical to those in Table 26.

[b] The peak and trough standings from which phase amplitudes are computed are centered three-month averages.

[c] The measures for each phase are weighted by the number of months to which they apply.

[d] Peak and trough standings from which phase amplitudes are computed are centered five-month averages because of the erratic character of the data.

[e] Net aggregate conforming amplitude of the specified investment series divided by the same measure for retail sales.

[f] Net aggregate conforming amplitude of investment of wholesalers divided by that of retailers.

investment is about half again as important as consumer demand. If subcycles are themselves subdivided on the basis of duration, we find that for the very short phases lasting less than half a year, investment in stocks is just twice as important as consumer buying in occasioning fluctuation in production.

These explorations lead to a fifth conclusion that may be added to the four based on Chart 15: Fluctuation in inventory investment in finished shoes probably accounts for at least as much of the subcyclical fluctuation in shoe production as does the variation in consumer takings. The proportion is inversely associated with the average duration of the phase.

Tables 26 and 27 frame a sixth point: *Retailers'* stocks are probably the major source of the large acceleration of consumer demand associated with stocks of finished shoes. The reason is simply that retailers carry most of the stocks held in commercial hands. Wholesalers' stocks contribute more to fluctuation in production than their size alone warrants.[8] And more in short phases than in longer ones, as the ratios in line 16 of Table 27 shows. Nevertheless, inventory investment by retailers alone is more important relative to consumer demand for shoes in short than in long phases of output.

These six characteristics provide the broad outlines of the relationship between shoe sales and production. But the statements require reinforcement and some elaboration.

ADDITIONAL FACTS ABOUT TIMING

Table 28 first compares the specific-*subcycle* turns of all the shoe series with the SLH-*subcycle* reference chronology.[9] To help judge how much reliance may be placed on the comparisons, measures of central tendency were included—the average deviation and the relation between the mean and the positional mean. The proportion of all turns that can be matched and the extent to which leads or lags predominate likewise help one to judge the firmness of the generalizations expressed in the statistic on average timing. The table supports the previous conclusions that the physical volume of retail sales and that of output shared subcyclical fluctuations, and that turns in retail sales do not tend to lead turns in physical production. It indicates that these conclusions also apply to measures of dollar volume in current prices.

But the table reveals an interesting difference between the timing relationships between sales and production at cycle and at subcycle turns. Cycle turns in sales lag cycle turns in production (section 2) by an average of two months [+1.0 — (—0.8)]; the average deviation is small. This difference is not the result of the intervention of a specific-subcycle turn between the specific-cycle turn and the reference-cycle turn, for the specific-subcycle and the specific-cycle turns associated with the reference-cycle turns are typically the same. This is shown in section 3 where timing is recorded for specific-*subcycle* turns that can be matched under subcycle timing rules to SLH-*cycle* reference turns. The slight tendency for sales to lag production at all subcycle turns is due to the consistent pressure of lags at cycle turns; computations not summarized in the table indicate that the relationship is virtually synchronous for the subcycle turns alone (the average lag of sales is only about one week).

When comparisons are made for dollar measures, the lag of sales at the four major turns in business, 1929–1940, is again apparent; though this time it is, in one case, dependent on overlooking a minor turn.[10]

[8] The size relationship of retailers' and wholesalers' stocks is represented by 78 and 11; fluctuations in investment by each type of distributor during subcycles in production is represented, as the summary figures in Table 26 indicate, by 35 and 11. The difference between the two sets of numbers reflects, in part, differences in conformity with subcycles in production of inventory investment by wholesalers and by retailers. But here the balance weighs in favor of retailers—70 per cent of the months are in like phase with production and only 65 per cent for wholesalers' inventory investment even after allowing for a typical lag of one month for the latter. In part, the difference reflects the severity and shape of fluctuation in stocks proper.

[9] Direct comparison of specific turns in inventory investment and other data with either retail sales or production is more precise, but use of the SLH chronology provides greater flexibility. Thus in the third and fourth lines of the table we can compare the timing of retail sales and production of shoes as was done in Chart 15, but we do so through the intermediary of the reference chronology. On the average, retail sales lagged the reference-subcycle dates by 0.3 month, and production led them by the same amount. Had both series happened to have matching turns for exactly the same reference turns and, of course, had the period of comparison been identical, then of necessity production would have led turns in sales by an average of exactly 0.6 month. But as the dates indicate, data on shoe production are available earlier than information on sales. The figures in the table were based on the whole stretch of years, and consequently do not apply to the same period. Also, for two of the twenty-three reference turns occurring during the period common to the two series, 1926–1940, both do not have matching specific turns; other series have similar and often more extensive differences. Thus conclusions about the timing relationships of two series that are reached by comparing both to the reference scheme typically do not yield answers identical to those based on direct comparisons. They are, however, usually very close to them; and if they are not, the fact is noted. In any event, statements based on average relationships are at best approximate.

[10] For the cycle turns in production matched to the four SLH-cycle turns, 1929–1940, the direct timing association of *cycles* in retail sales, when both production and sales are expressed in pairs, is —2, +1, +5, +5; the corresponding figures for comparisons in dollar measures are —2, +8, +3, +5. The timing association for matching *subcycles* in retail sales is the same in the case of the pair data; for the dollar measures the timing at the 1932 trough is —1 instead of +8.

TABLE 28

Timing of Turns: Various Shoe Series Compared with SLH Reference Chronologies, 1923–1940

1. SPECIFIC SUBCYCLES RELATED TO SLH REFERENCE SUBCYCLES [a]

	NUMBER OF TURNS						TIMING (*months*)		
			Matched Turns						
	Reference Turns Covered (1)	*All Specific Turns* (2)	*Total* (3)	*Leading* (4)	*Lagging* (5)	*Synchronous* (6)	*Mean Lead (−) or Lag (+)* (7)	*Average Deviation* (8)	*Mean of Central 3 or 4 Turns* (9)
Retail sales, dollars (31)	23	20	19 [b]	4 [b]	8	7	+0.5 [b]	1.6 [b]	0 [b]
Production, dollars (41)	28	26	24	8	8	8	−0.2	1.2	0
Retail sales, pairs (33)	23	24	21 [b]	6 [b]	10	5	+0.3 [b]	1.4 [b]	+0.2 [b]
Production, pairs (39)	28	28	26	10	5	11	−0.3	1.3	0
Total stocks, pairs:									
First differences (47) [c]	22	22	20	10	7	3	0	2.4	−0.5
Stocks proper (48)	23	14	14	2	9	3	+2.1	2.2	+1.5
Ratio of retail sales to stocks (58)	23	21	19	12	4	3	−2.2	2.7	−1.0
Distributors' stocks, pairs:									
First differences (54) [c]	22	24	20	4	12	4	+0.6	1.3	+1.0
Stocks proper (54)	22	16	12	2	10	0	+2.8	2.1	+2.0
Ratio of retail sales to stocks (59)	22	20	17	12	3	2	−2.4	2.5	−1.7
Department store:									
Sales, dollars (28)	23	27	21	10	9	2	−0.3	2.1	−0.3
Receipts, dollars (63)	23	22	14	4	6	4	−0.1	1.5	+0.2
Sales, pairs (29)	23	27	21	10	8	3	−0.3	1.8	−0.3
Receipts, pairs (62)	23	24	16	5	7	4	−0.4	1.8	+0.2
Stocks, pairs:									
First differences (51) [c]	22	25	16	4	9	3	+0.7	1.6	−0.8
Stocks proper (52)	22	22	13	1	11	1	+2.8	2.2	+2.7
Ratio of sales to stocks (55)	22	16	15	10	4	1	−1.3	2.2	−1.0
Wholesalers':									
Sales, dollars (36)	25	28	22	14	6	2	−1.2	1.6	−2.0
Receipts, dollars (61)	25	25	25	15	9	1	−0.7	1.8	−1.0
Sales, pairs (37)	25	27	22	16	4	2	−2.0	1.5	−2.0
Receipts, pairs (60)	25	25	23	16	7	0	−1.1	1.6	−1.3
Stocks, pairs:									
First differences (46) [c]	25	25	22	10	10	2	−0.5	2.8	0
Stocks proper (46) [d]	25	27	22	0	20	2	+3.4	1.6	+3.8
Ratio of sales to stocks (57)	24	28	21	15	3	3	−2.0	1.7	−2.0

2. SPECIFIC CYCLES RELATED TO SLH REFERENCE CYCLES [a]

	NUMBER OF TURNS						TIMING (*months*)	
			Matched Turns					
	Reference Turns Covered (1)	*All Specific Turns* (2)	*Total* (3)	*Leading* (4)	*Lagging* (5)	*Synchronous* (6)	*Mean Lead (−) or Lag (+)* (7)	*Average Deviation* (8)
Retail sales, dollars	4	6	4	1	3	0	+3.8	2.8
Production, dollars	6	6	6	1	3	2	+0.3	1.0
Retail sales, pairs	4	10	4	1	3	0	+1.0	1.0
Production, pairs	6	16	6	2	1	3	−0.8	1.4
Total stocks, pairs:								
First differences [c]	4	8	3	3	0	0	−10.3	10.4
Stocks proper	4	7	4	0	3	1	+3.0	1.5
Ratio of retail sales to stocks	4	7	3	3	0	0	−4.0	2.0
Distributors' stocks, pairs:								
First differences [c]	4	9	4	2	1	1	−1.0	1.5
Stocks proper	4	4	4	1	3	0	+6.8	3.8
Ratio of retail sales to stocks	4	8	2	2	0	0	[e]	[e]
Department store:								
Sales, dollars	4	4	4	1	3	0	+1.8	2.8
Receipts, dollars	4	4	4	2	1	1	+1.5	3.2
Sales, pairs	4	4	4	1	3	0	+4.0	5.5
Receipts, pairs	4	4	4	2	1	1	+1.5	3.2
Stocks, pairs:								
First differences [c]	4	11	4	2	1	1	−1.0	1.5

(continued on next page)

TABLE 28 (continued)

2. SPECIFIC CYCLES RELATED TO SLH REFERENCE CYCLES [a] (continued)

	NUMBER OF TURNS						TIMING (*months*)	
			Matched Turns					
	Reference Turns Covered (1)	*All Specific Turns* (2)	*Total* (3)	*Leading* (4)	*Lagging* (5)	*Synchronous* (6)	*Mean Lead (−) or Lag (+)* (7)	*Average Deviation* (8)
Stocks proper	4	5	4	0	4	0	+5.8	2.8
Ratio of sales to stocks	4	10	3	2	1	0	−10.7	14.2
Wholesalers':								
Sales, dollars	5	5	4	3	1	0	0	3.0
Receipts, dollars	5	3	3	3	0	0	−2.7	0.4
Sales, pairs	5	11	4	3	0	1	−2.2	1.2
Receipts, pairs	5	13	4	3	1	0	−1.8	1.4
Stocks, pairs:								
First differences [c]	5	10	2	1	1	0	[e]	[e]
Stocks proper	5	7	4	0	4	0	+10.5	6.5
Ratio of sales to stocks	5	11	4	3	0	1	−2.2	1.2

3. SPECIFIC SUBCYCLES RELATED TO SLH REFERENCE CYCLES [a]

	NUMBER OF TURNS					TIMING (*months*)	
		Matched Turns					
	Reference Turns Covered (1)	*Total* (2)	*Leading* (3)	*Lagging* (4)	*Synchronous* (5)	*Mean Lead (−) or Lag (+)* (6)	*Average Deviation* (7)
Retail sales, dollars	4	3	1	2	0	+2.3	2.2
Production, dollars	6	6	1	3	2	+0.3	1.0
Retail sales, pairs	4	4	1	3	0	+1.0	1.0
Production, pairs	6	6	2	1	3	−0.8	1.4
Total stocks, pairs:							
First differences [c]	4	4	3	1	0	−1.0	1.5
Stocks proper	4	4	0	3	1	+3.0	1.5
Ratio of retail sales to stocks	4	3	3	0	0	−4.0	2.0
Distributors' stocks, pairs:							
First differences [c]	4	4	2	1	1	−1.0	1.5
Stocks proper	4	4	1	3	0	+3.0	3.0
Ratio of retail sales to stocks	4	3	3	0	0	−4.3	3.8
Department store:							
Sales, dollars	4	4	1	3	0	+0.5	1.8
Receipts, dollars	4	4	2	1	1	−0.2	0.8
Sales, pairs	4	4	1	3	0	+0.5	1.8
Receipts, pairs	4	4	2	1	1	−0.2	0.8
Stocks, pairs:							
First differences [c]	4	4	2	1	1	−1.0	1.5
Stocks proper	4	4	0	4	0	+4.5	2.5
Ratio of sales to stocks	4	4	2	2	0	−1.3	3.4
Wholesalers':							
Sales, dollars	5	5	3	1	1	−1.0	1.2
Receipts, dollars	5	5	4	1	0	−1.6	1.3
Sales, pairs	5	5	3	1	1	−1.6	1.7
Receipts, pairs	5	5	4	1	0	−1.6	1.3
Stocks, pairs:							
First differences [c]	5	5	4	1	0	−2.6	3.7
Stocks proper [d]	5	3	0	3	0	+4.0	1.3
Ratio of sales to stocks	5	4	3	0	1	−2.2	1.2

[a] Specific turns in each series are related in accordance with our usual timing rules to corresponding SLH reference turns (see Appendix A, secs. 8, 9, and 10a, b, c). *In the first section:* Comparisons cover *subcycle specific and reference* turns. *In the second section:* Minor specific turns are ignored and *specific-cycle* turns are matched with turns in the *SLH-cycle reference* chronology. *In the third section:* Any *specific-subcycle* turn is eligible to be matched with turns in the *SLH-cycle reference* chronology.

[b] A trough in shoe sales eleven months prior to the reference trough in February 1929 is related to it by the timing rules but was excluded from the averages since the results seemed arbitrary.

[c] Centered five-month moving averages of month-to-month change for stocks proper.

[d] Related to reference chronology on basis of three-month lag.

[e] When fewer than three turns can be related, mean timing has not been calculated.

One is hesitant to base conclusions on the observation of four episodes, especially when each does not repeat the same finding. Suffice it to say that these few figures are consistent with a tendency for consumers' shoe buying to lag behind shoe production at cycle turns but not at the subcycle turns; whether this is the correct interpretation must wait on the study of other goods or other times.

For department stores and wholesalers, the flow of shoes can be recorded at another stage—the point where it enters the establishment. The record is rough-hewn from data on sales and on change in stock, but nevertheless it is worth study. In general, it shows a synchronous relation between turns in shoes moving into and out of retail or wholesale shops; indeed, for wholesalers there may be a slight tendency for turns in inflow to follow those in outflow. No reliable difference between major and minor turns is shown. This hints that any tendency for production to anticipate turns in sales must manifest itself in the interval between when shoes move off production floors and into distributors' stores.

The table reaffirms that investment in inventories by distributors seems, on the average, to synchronize with, or slightly to lag, output and sales.[11] The correspondence with turns in output is found at major and minor turns alike.

The table also presents data on stocks proper and their turnover rate. Department-store stocks lag the reference scheme quite regularly. This may mean that retailers' sales-stock ratio is not constant over the subcycle; indeed, stocks tend to turn faster as business improves, but occasionally cease to do so some months before sales or production starts to fall; an analogous statement applies to recessions.[12]

Though similar in several respects, wholesalers' stocks play an interesting variation on the theme sounded by retailers' stocks. Though turns in inventory investment seem to synchronize with the reference chronology, on the average, they have a clear preference for leads at troughs and lags at peaks.[13] Since wholesalers' sales lead the reference chronology, their inventory investment, instead of tending to turn synchronously with their sales, turns later—at least at peaks. Further, the association between sales and inventory investment seems even looser than for retailers. For wholesalers, the sales-stock ratio has a strong subcyclical pattern[14] which is primarily determined by that of sales and does not, as for retailers, frequently lead sales.

ADDITIONAL FACTS ABOUT AMPLITUDE

Table 29 searches for further evidence on the observed tendency for subcyclical fluctuation to increase in strength as consumer buying is transmitted to shoe production, and for subcyclical amplitude to increase more than that of the major cycles. Amplitude per month during all specific subcyclical fluctuations and during those associated with the major swings in the industry is given for pairs of comparable activities in a vertical sequence. In order to subdue the power of erratic components in the data to influence the character of the comparisons, amplitudes for each series during *reference* subcycles and cycles are also given. Finally, ratios of cycle to subcycle amplitude were computed; if these ratios are less as we move from the stage nearer the consumer to the earlier stage, subcyclical amplitude has increased more (or decreased less) than cyclical amplitude. Nine pairs of statistics could be assembled. Counting both specific and reference amplitudes, subcyclical amplitude was greater at the earlier than at the later stage in 17 cases and less in 1; cyclical amplitude was greater in 16 cases and less in 2; the ratio of cyclical to subcyclical amplitude was less in the earlier stage in 15 cases, the same in 1, and less in 2. Study of the table indicates that the greater fluctuation of the flows of sales and production is associated with greater fluctuation in inventories and turnover ratios, and even with specific variation in inventory investment expressed as a percentage of sales.[15]

Inventory investment in shoes plays an important part in contributing to fluctuations identified not only in shoe production, but also in the shoe, leather, hide industry as a whole. Since the amplitude of investment in stocks (lines 21, 23, 25) is stated as a percentage of average sales of shoes,[16] it is directly comparable to the corresponding sales statistics (lines 1, 3, and 5).

[11] See, however, note 13 below. Direct comparisons between inventory investment and sales or output lead to a similar conclusion.

[12] Comparisons between sales and sales-stock ratios without the intermediary of the reference scheme present the same picture. The majority of turns are synchronous; there is hardly ever a lag, and there are quite a few leads. Conditions under which the leads sometimes appear are discussed in Chapter 9.

[13] Wholesalers' inventory investment has on the average a lead of 1.5 at troughs and a lag of 0.5 at peaks, and this average difference is associated with a corresponding difference in the number of leads and lags (at troughs: 7 leads, 4 lags, 0 synchronous; at peaks: 3 leads, 6 lags, 2 synchronous). Similar differences do not appear in any of the other data on inventory investment, receipts, or stocks proper.

[14] Specific-subcyclical amplitude of the sales-stock ratio for shoe wholesalers is 4.38 per cent of its average level per month. The corresponding figure for shoe stocks of department stores is 1.14.

[15] Had fluctuation in investment been expressed as a percentage of inventory itself, the magnification of fluctuation at the earlier stage would have been greatly increased, since stocks are far smaller relative to sales for wholesalers than for retailers.

[16] See Table 29, note f.

TABLE 29

Amplitude of Subcycles and Cycles in Activities of Shoe Distributors and Producers, 1926–1940 [a]

	SPECIFIC AMPLITUDE PER MONTH [b] (per cent)			SUBCYCLE REFERENCE CONFORMITY [c]		REFERENCE AMPLITUDE PER MONTH [d] (per cent)		
	Subcycles	Selected Major Cycles [e]	Ratio of Cycles to Subcycles	Index	Timing Allowance (months)	Subcycles	Cycles	Ratio of Cycles to Subcycles
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Physical volume measures:								
1. Retail sales (33)	1.28	0.64	0.50	+67	0	0.71	0.53	0.76
2. Shoe production (39)	2.69	1.33	0.49	+100	0	1.85	0.90	0.49
3. Department store sales (29)	1.31	0.75	0.57	+43	0	0.46	0.48	1.04
4. Department store receipts (62)	2.41	1.08	0.45	+90	0	1.25	0.82	0.66
5. Wholesalers' sales (37)	3.26	1.42	0.44	+83	−2	2.20	0.91	0.42
6. Wholesalers' receipts (60)	3.97	1.67	0.42	+83	−1	2.35	0.86	0.37
Dollar volume measures:								
11. Retail sales (31)	1.29	1.00	0.79	+62	0	0.65	0.77	1.19
12. Shoe production (41)	2.07	1.26	0.61	+100	0	1.85	1.13	0.61
13. Department store sales (28)	1.33	0.96	0.72	+43	0	0.46	0.70	1.51
14. Department store receipts (63)	2.48	1.28	0.52	+100	0	1.21	0.97	0.80
15. Wholesalers' sales (36)	3.01	1.54	0.51	+92	−1	1.77	0.92	0.52
16. Wholesalers' receipts (61)	3.27	1.69	0.52	+100	−1	2.04	0.98	0.47
Inventory investment, physical volume: [f]								
21a. All hands (47)	1.60	0.77	0.48	+62	0	0.94	0.39	0.42
21b. Distributors' (54)	1.78	0.78	0.43	+80	0	0.77	0.40	0.52
23. Department stores' (51)	1.29	0.52	0.40	+81	0	0.54	0.33	0.61
25. Wholesalers' (46)	1.75	0.70	0.40	+74	0	0.52	0.13	0.25
Stocks, physical volume: [g]								
31. Distributors' (54)	0.81	0.63	0.78	+81	+2	0.45	0.46	1.02
33. Department stores (52)	0.72	0.56	0.78	+62	+2	0.40	0.44	1.11
35. Wholesalers' (46)	1.86	1.01	0.55	+68	+4	1.13	0.65	0.58
Sales-stock ratios:								
41. Distributors' (59)	1.33	0.56	0.42	+71	−1	0.77	0.13	0.17
43. Department stores' (55)	1.14	0.50	0.43	+52	−1	0.54	0.08	0.14
45. Wholesalers' (57)	4.38	1.02	0.23	+83	−2	2.60	0.63	0.24

[a] Specific-cycle amplitude calculations, whether or not earlier data are available, include periods that are never longer than January 1926, when the retail sales data first became available, to December 1940; but they may be shorter depending on when the initial trough and terminal peak is selected (see note e). This pruning of materials was necessitated by the fact that the per month amplitude of most data was so much greater during the 1929 to 1933 recession than at most other times that the weight of these months in the total must be approximately equalized if interseries comparisons are not to be distorted.

[b] See Appendix A, sec. 16. Each fall from peak to trough is added to each rise from trough to peak, divided by the number of months covered, and expressed as a percentage of the average monthly value of the series, except in the case of inventory investment (see note f).

[c] Conforming movements are scored 100; nonconforming movements, −100; neutral movements, zero; and the series averaged (see Appendix A, secs. 12 and 13). When the timing allowance is other than zero, all calculations have been made for dates that lead (−) or lag (+) the reference chronology by the stated number of months.

[d] See Appendix A, sec. 15. The initial trough in 1924 of the reference-*cycle* expansion phase terminating in the 1929 peak lies outside the period covered in this table (see note a). Rather than lose the whole phase, we have used the portion starting with the subcycle trough in October 1927. An analogous statement applies to the terminal peak for the expansion, starting with the 1938 trough; in this case the subcycle peak in December 1939 was used. Consequently, the reference measures cover October 1927 to December 1939, with nineteen subcycle phases averaging 7.7 months per phase.

[e] Amplitudes for specific major cycles which are defined by those specific-*cycle* turns associated with the SLH-cycle reference turns (see Appendix A, sec. 10e). Except that incomplete initial and terminal expansions are included for which the bounding initial or terminal turn selected is that specific-*subcycle* trough, not earlier than January 1926 or peak not later than December 1940, which maximizes the total amplitude of these two incomplete cycle phases.

[f] The figures for inventory investment are expressed as a percentage, not of the average standing of the *investment* series (which, because of the alternation of plus and minus figures, is close to zero), but of the average standing of the corresponding *sales* series. For both inventory investment of distributors and in all hands (lines 21a and b), the corresponding sales series is taken as total retail sales in pairs.

[g] The figures for stocks are expressed as ratios to the average standing of the specified stock series.

Apparently distributors' inventory investment contributed as much as retail sales to fluctuation during reference subcycles, though less during reference cycles; this is consistent with the differences found in the contribution of investment to fluctuations of various duration in shoe production.

Stock and the Sales-Stock Ratio

Changes in stock play an important part in accounting for the variability in production or receipts of merchandise relative to sales to the consumer. Consequently an understanding of how stocks change and

what factors govern them is essential to an understanding of the vertical relationships in an industrial sequence. Leaving the analysis of process for the next two chapters, we examine how they behave.

Table 28 showed by comparisons with the SLH chronology that shoe stocks, whether belonging to department stores, wholesalers, or all distributors, typically lagged sales by two or three months. Their rate of change tended approximately to synchronize with sales. These facts are consistent with considerable parallelism in the movement of stocks and sales.

To see whether such parallelism exists, direct comparisons between sales and stocks are made in Table 30. The percentage of months in unlike subcyclical phase is shown to be high; even after allowing for lags that maximize parallelism, between 40 and 44 per cent of months for the several comparisons are in unlike phase—little better than a chance association. Most of the logic that suggests that stocks will move with sales would apply likewise to a parallelism between increments of sales and stocks or even between sales proper and increments of stocks. Accordingly, the percentage of these series in unlike phases is also shown in the table. Although parallelism between sales proper and rates of change in stock is a trifle closer than for the others, at least for wholesalers, it is not high enough to arrest attention. The figures insist that whatever retailers and wholesalers aim to do by way of keeping their stocks adjusted to changes in sales, they do not achieve this adjustment during the short swings in business designed as subcycles.

TABLE 30

Percentage of Months in Unlike Subcyclical Phase for Shoe Sales and Stock, 1926–1940

	MONTHS IN UNLIKE PHASE AS % OF ALL MONTHS [a]		
		Timing that Maximizes Correspondence	
	Synchronous Timing (%) (1)	*Lead (−) or Lag (+)* (*months*) (2)	(%) (3)
1. REFERENCE FRAME: RESPECTIVE SALES [b]			
Stocks:			
Distributors' (54)	47	+3	44
Department store (52)	61	+4	43
Wholesalers' (46)	56	+5 and +4	40 and 41
2. REFERENCE FRAME: FIRST DIFFERENCES [c] IN RESPECTIVE SALES			
First differences [c] in stocks:			
Distributors' (54)	51	+3	43
Department store (51)	61	+4	55
Wholesalers' (46)	60	+5	40
3. REFERENCE FRAME: RESPECTIVE SALES			
First differences [c] in stocks:			
Distributors'	41	+1	40
Department store	54	+3	43
Wholesalers'	47	+3	31

[a] See Appendix A, sec. 14.

[b] The respective sales series appropriate to each of the three lines for all sections are: total retail (33); department store (29) and wholesalers' (37).

[c] Centered five-month moving averages of month-to-month change.

During longer swings it would be surprising indeed if somewhat more parallelism were not achieved, and Table 31 indicates that it is. The table shows that although during subcycles (upper section) the average phase amplitude of sales and the sales-stock ratio are virtually the same, thus indicating that the behavior of stock is virtually random with respect to sales, this is not the case for cycles associated with the major business turns (lower section). The ratio, though it varies (except for wholesalers) substantially more than it does during all subcyclical phases, varies considerably less than the corresponding sales data. This means that stocks parallel the broad movements in sales for at least part of the time.

These findings seem strangely inconsistent with repeated statements of distributors that sales-stock ratios are kept approximately constant. Part of the explanation may be that the statement is often made in reference to intentions rather than to accomplishments. Part may also be that our figures, since they do not apply to identical establishments, and in any event involve hazardous calculations,[17] overplay variation. One further explanation is suggested: when the percentage change in the ratio as given in the calculations is converted to change in annual or seasonal turnover rates—the figures actually watched by businessmen—the change may not seem so large. Columns 3, 4, and 5 of the table show what the figures would be. For department stores, we see that the extreme range is from a peak figure of 2.7 to a trough figure of 2.3. In view of the very large seasonal shifts in the turnover ratios, alterations of a few tenths of a point may seem like fairly steady behavior. In any event, the statistics indicate that change in shoe stocks does not parallel sales or changes in sales during short movements. During long and strong ones, stocks do eventually follow the trend of sales. These findings receive both explanation and analysis of their consequences in later chapters.

The Pattern of Orders

We have seen that producers of shoes generally start to reduce their output at the same time or even before retailers' customers start to reduce their buying, and a similar remark applies to increases in output. We have

[17] See the description of price deflations necessary to the computation of the several stock series and sales-stock ratios in Appendix B.

TABLE 31

Specific Amplitude of Subcycles and Cycles in Pair Shoe Sales and Sales-Stock Ratios, 1926–1940

	PER PHASE AMPLITUDE [a]		AVERAGE ANNUAL SALES-STOCK RATIOS [b]		
	Sales (1)	*Sales-Stock Ratio* (2)	*All Years* (3)	*Peaks* (4)	*Troughs* (5)
			SUBCYCLES		
Retail shoe sales (33) and distributors' stocks (59)	11.5	12.2	2.1	2.2	2.0
Department-store shoe sales (29) and stocks (56)	11.4	12.1	2.5	2.7	2.3
Shoe wholesalers' sales (37) and stocks (57)	23.4	30.5	6.0	6.9	5.1
			MAJOR CYCLES [c]		
Retail shoe sales and distributors' stocks	24.1	19.1	2.1	2.3	1.9
Department-store shoe sales and stocks	26.6	17.8	2.5	2.7	2.3
Shoe wholesalers' sales and stocks	43.3	30.7 [d]	6.0	6.9	5.1

[a] Amplitude is calculated as the aggregate rise during expansion and fall during recession divided by the number of phases covered. It is expressed as a percentage of the average value of the series (see Appendix A, sec. 16). Sales and sales-stock ratios have been adjusted so as to have the same number of phases; there were fifteen phases for the first two sets of data and seventeen for wholesalers.

[b] Column 3 was obtained from various sources: For distributors, it was based on our annual estimates of sales, 1926–1940, and on estimates of stock based on census data. For department stores, it was based on statistics obtained by the Controllers' Congress of the National Retail Dry Goods Association for 1939. The turnover ratios of men's and women's shoe departments of department stores of various sizes were combined. For wholesalers, the ratio was based on the *Census of Distribution, 1939* for data on the several sorts of "stock-carrying" shoe wholesalers combined.

To obtain columns 4 and 5, the per phase percentage amplitude (column 2) was applied to the annual sales-stock ratio (column 3) to get actual amplitude per phase. This figure was divided by two; it was added to the average ratio to obtain the figure for peaks and subtracted to obtain the figure for troughs.

[c] The specific cycles associated with the SLH reference cycles in 1929, 1932, 1937, and 1938.

[d] The specific cycles associated with the reference cycles by the timing rules did not in this case, as in most, maximize the size of these major swings. If the associations are made to maximize amplitude (disregarding timing rules) the amplitude is 70.6 per phase.

found no ready explanation for this interesting phenomenon in the actual behavior of distributors' stocks and their relation to sales. But whatever the basic explanation, the figures seem to imply that some sort of communication between retailer and producer takes place that enables producers to foretell consumer takings in time to have finished shoes issuing from production floors synchronously with, or even sooner than, the turn in the tide of consumer buying. What is the harbinger of this change? There is, I think, an answer to this question; and like many answers, it has several levels. At the most superficial, it is simply this: Orders for shoes placed by retailers appear to lead consumer buying.

The evidence on which this statement is based consists of two time series neither one of which deals precisely, as would be desirable, with the orders placed by retailers with producers. The first is based on reports of a small sample of leather and shoe manufacturers in New England, which have been compiled by the Associated Industries of Massachusetts (AIM) since 1927. As the compilers state, the figures are not meant to be used alone (they are published in combination with those of other sorts of firms) and are not considered representative even of the shoe and leather industry of New England, much less of the shoe industry alone for the United States. However, other information beginning in 1937 suggests that there may well be little systematic difference in subcyclical patterns of orders placed for shoes and for leather. Consequently, this AIM shoe and leather orders series was used as one of the sources of information on shoe orders.

The second group of data that, I believe, bears witness to the timing of orders, as distinguished from completed production, is the mystery series—wholesale sales. A sizable portion of the orders received by many wholesalers are shipped out (a "sale" seems typically to be recorded at the time of shipment) within a few days or even hours after having been received. For this portion of wholesalers' sales, monthly statistics of orders and sales would be virtually identical. It is impossible to say what portion of total sales would be of this sort; it would depend, among other

things, on the condition of wholesalers' stocks. But since the orders for immediate delivery will be one of the more variable portions of total business, in the short run at least, it seems likely that the timing evinced by the index of wholesalers' sales of shoes will bear a family resemblance to data on retailers' orders, especially on their orders for "at once" delivery.

Turning to an examination of timing characteristics, we find that peaks and troughs in both of these proxies for shoe orders diligently lead those of retail sales. In Table 32, specific subcycles in retail sales of shoes are used as a reference chronology with which shoe and leather orders, then wholesale sales, are compared. Of the 15 and 18 matched turns (column 5), only 3 in the case of orders and 2 in the case of wholesale sales (column 14) lag retail sales; the rest either synchronize or lead. Almost three-quarters of all turns (column 6) lead. Because both retailers and wholesalers keep track of sales primarily in dollar, rather than pair, units and because orders for shoes and leather are often recorded the same way, it is well to check the dollar figures; these, the table shows, tell the same story as the physical measures. For both physical and dollar measures, the tendency for orders to lead seems especially strong at peaks, where leads of over three months are more common than at troughs. I might add that though the difference between behavior at peaks and that at troughs cannot be reliably established by the data, it fits neatly into the general explanation developed in the next chapter.

But for orders to be the agent whereby changes in production are initiated, producers must actually wait to place shoes in production until orders for them are at hand. Men in the industry consistently tell us that this is the case, and we examine a little relevant statistical evidence in Chapter 11. But the series that have just been studied also bear on the matter by indicating that orders typically lead or synchronize with shoe production. Since shoes can be produced in about two weeks, and since, in addition, semifinished shoes can be moved through the numerous processes more rapidly or more slowly as occasion demands, changes in the quantity of orders can be reflected in parallel changes in production the same month. The association of orders and output can be studied in Table 32, where, in the last six lines, the order series are matched turn by turn to a reference frame of specific subcycles in pairs of shoes produced. Four turns in each series lag, and the rest either synchronize or lead. In the case of AIM orders, 3 of the 4 lags are only a month long; in the case of wholesale sales, the 4 lagging turns constitute only 15 per cent of the 26 matched turns. Here, again, we find a tendency for leads to be longer or more frequent at peaks than at troughs. For shoe and leather orders and wholesale sales, the average lead is less than half a month at troughs (column 16). This is due to fewer leads of three months or more at troughs as well as, in the case of wholesale sales, an extraordinary concentration of synchronous troughs.[18]

One explanation for these differences between peak and trough timing may be that a sufficient backlog of orders exists at subcyclical peaks, so that a few months must pass before a slackening in the orders currently received manifests itself in a reduction in output. At troughs, on the other hand, there is nothing to prevent an immediate resumption of work when orders pick up, and often this resumption will result in finished shoes before more than a few weeks have passed, and this is consistent with the synchronous timing of monthly statistics. The sensitive response would be achieved because the manufacturer speeds up work already on production floors (largely by reducing waiting time of goods in process) as well as runs new orders through rapidly by reducing the waiting time of employees. The table supports one further observation: The association between orders and output seems to be unusually close—only 26 and 27 per cent of the months for the two series representing orders were in opposite subcycle phase from shoe production. In view of the technical deficiencies, especially of the AIM order series, the similarity is quite striking.

The picture that the figures convey of this dynamic personality—the order blank—has further implications. It suggests how additions or subtractions to retailers' stock both on hand *and on order* may behave. Because orders have a wider subcyclical amplitude than receipts or production, there is reason to suspect that changes in the total ownership position in stocks (investment in stocks on hand and on order, and still we think primarily in physical terms) would be more variable than changes in stocks on hand only; also, the early turns in orders should make early turns in inventory investment in shoes on hand and on order quite likely.[19]

A computation that pushes all of our observations and guesses to the point of foolhardiness offers corroboration. Assuming wholesale sales represent retailers' orders, we convert the index to actual pairs by linking it to the average number of pairs produced. We

[18] I have made these calculations on the basis of a comparison of deflated series. Were undeflated wholesale sales and the AIM order series (which appears to be reported partly in physical and partly in dollar form) compared with production converted to dollar estimates, the lead of the order data would be slightly emphasized and the difference between peaks and troughs would persist.

[19] It would be possible to design a subcyclical pattern for delivery periods (the interval between acceptance of the order and delivery of the merchandise) that would successfully counteract the tendency toward a lead that is implicit in the relation between sales and new orders, but there is no reason to assume that this pattern would actually apply.

TABLE 32

Timing of Subcycles: Shoe Orders Compared with

	REFERENCE FRAME: *Retail Sales (R.S.) or Production (P.)* [a] (1)	TYPE OF TURNS COVERED (2)	REFERENCE TURNS COVERED (*number*) (3)	ALL SPECIFIC TURNS (*number*) (4)	*Total* (*no.*) (5)	*Total* (*%*) (6)	*Total* (*no.*) (7)
Shoe and leather orders (38) [e]	*R.S.*, pairs	All	23	24	15	73	11
		Peaks			7	86	6
		Troughs			8	62.5	5
Wholesale sales, pairs (35) [f]	*R.S.*, pairs	All	24	22	18	72	13
		Peaks			9	89	8
		Troughs			9	56	5
Shoe and leather orders [e]	*R.S.*, dollars	All	19	24	14	71	10
		Peaks			7	86	6
		Troughs			7	57	4
Wholesale sales, dollars (34) [f]	*R.S.*, dollars	All	20	20	16	69	11
		Peaks			8	75	6
		Troughs			8	62.5	5
Shoe and leather orders [e]	*P.*, pairs	All	24	24	17	53	9
		Peaks			9	56	5
		Troughs			8	50	4
Wholesale sales, pairs [g]	*P.*, pairs	All	28	26	26	62	16
		Peaks			13	85	11
		Troughs			13	38	5

[a] The series used as reference frames are the following series in Appendix B: retail shoe sales, pairs 33, dollars 31; and shoe production 39.

[b] For the rules used in matching subcycle turns, see Appendix A, secs. 10a, b, c, d.

[c] See Appendix A, sec. 11.

then subtract retail pair sales from orders to obtain change each month in retailers' stock on hand and on order. The series has a strong lead relative to the reference chronology, with which it has a marked similarity. Allowing for a lead of three months, 26 per cent of the months are in unlike phase, and the association would be still closer were we to allow for the shorter lead at troughs and the longer one at peaks that characterize these data. The data also reveal the expected lead over retail sales, and at ten turns, over wholesale sales as well. The greater amplitude of subcyclical fluctuation is likewise clearly evident.

Apparently orders by distributors may pass back to shoe producers not only the gyrations of consumer buying plus those of distributors' stocks, but also those associated with an alternating increase and decrease in the amount of shoes on order. Further, unlike the other two, the third source of fluctuation may tend to reverse direction before the turns in sales or industry affairs, thus acting in the general manner attributed to inventory investment by the timing aspect of the acceleration principle. But conformity to the acceleration model stops there. Investment in stocks on hand and on order, instead of synchronizing with or lagging the *rate of change* in sales, as the acceleration principle requires, actually leads, and the two series—month-to-month change in sales and in the market position—bear only a very rough relationship to one another (36 per cent of the months are in unlike phase after allowing for the lead). Further, though the computations cannot provide estimates of the market position proper,[20] they suggest that under no circumstances would the ratio of sales to stocks on hand and on order be reasonably constant (either the average or incremental ratio).

Summary

We have learned that fluctuations in shoe production generally parallel those in retail sales, but have markedly greater amplitude. The augmentation is associated

[20] Wholesale sales have a strong but variable trend that cannot be removed except by some arbitrary procedure. Consequently, although different rates of change in the wholesale index and in retail sales for short periods—the figures that largely determine the inventory investment statistics—are meaningful, to cumulate them for a stretch of years is quite improper.

Retail Shoe Sales and Shoe Production, 1923–1940

MATCHED SPECIFIC TURNS [b]								TIMING (*months*) [c]		MONTHS IN UNLIKE PHASE AS % OF ALL MONTHS [d] *Timing That Maximizes Correspondence*	
Leading					*Lagging*						
3 Mos. and Over	*2 Mos.*	*1 Mo.*	*Synchronous*		*Total*		*1 Mo.*	*Mean Lead (−) or Lag (+)*	*Average Deviation*	*Lead (−) or Lag (+) (months)*	(%)
	(*number*)		(%)	(*no.*)	(%)	(*no.*)	(*no.*)				
(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
6	2	3	7	1	20	3	2	−1.7	2.2	−2	34
4	1	1	0	0	14	1	1	−2.6	1.6		
2	1	2	12.5	1	25	2	1	−1.0	2.2		
7	3	3	17	3	11	2	1	−1.3	2.0	−2	32
5	3	0	11	1	0	0	0	−2.6	0.9		
2	0	3	22	2	22	2	1	−0.1	2.3		
7	1	2	7	1	21	3	1	−2.4	3.1	−3	35
5	0	1	0	0	14	1	0	−3.7	3.1		
2	1	1	14	1	29	2	1	−1.0	2.6		
6	2	3	12.5	2	19	3	1	−1.6	2.3	−2	28
4	1	1	12.5	1	12.5	1	0	−2.5	2.2		
2	1	2	12.5	1	25	2	1	−0.6	2.2		
2	7	0	24	4	24	4	3	−0.9	1.7	−2	26
2	3	0	22	2	22	2	2	−1.3	1.6		
0	4	0	25	2	25	2	1	−0.4	1.6		
9	4	3	23	6	15	4	1	−1.6	2.2	−2	27
8	1	2	0	0	15	2	1	−2.8	2.2		
1	3	1	46	6	15	2	0	−0.4	1.4		

[d] See Appendix A, sec. 14.
[e] Comparisons start with 1927.
[f] Comparisons start with 1926.
[g] Comparisons start with 1923.

with strong fluctuations in the rate at which distributors' inventories rise or fall. The contribution of this inventory investment to subcyclical fluctuations in output is, on the average, somewhat greater than the contribution of consumer takings. Fluctuations in distributors' stocks, whether intended or otherwise, play a larger part in the short movements in production than in the longer ones. But the magnifying influence of stocks tends to reach maxima and minima at about the same time as does fluctuation in consumer demand, so that there is no delay in the backward transmission of a reversal in consumer buying. Indeed, especially at the major turns, there may be a tendency to anticipate it.

The chief agent of transmission is, as far as we can tell, the order. Such evidence as there is suggests not only that orders tend to reach peaks and troughs ahead of sales, especially peaks, but also that they have stronger subcyclical amplitude than even shoe output. Thus retailers' buying may well comprehend an alternating increase and decrease in shoes on order, which adds to the excitation of earlier stages. Further, the relation of peaks and troughs in orders to those in shoe production is such that it would be quite possible for reversals in retailers' buying to be largely, if not wholly, responsible for reversals in shoe manufacturers' output. Thus the figures support the claim that most shoes are produced directly or indirectly in response to an order for them. The suggestion that the flow of orders rather than of output—pieces of paper rather than cases of shoes—may be more helpful in explaining the dynamics of demand transmission simply phrases a new question without answering it. The question is: Why do orders placed by retailers turn earlier and have greater amplitude of fluctuation than consumer buying?

The investigations just summarized are a first step in providing the answer. They have located—some more securely than others—what I like to think of as a series of marker posts placed at selected points in a field in which an obstacle race is to be run. The course may eventually be laid anywhere, with this restriction: the marker posts are all to lie along the final track. As we proceed with our empirical studies, we try to locate more and more of these posts; and as the number mounts, the possible position of the path is progressively limited.

But even the posts now located rule out the track followed by any ready-made theory unless it were substantially rephrased. If the acceleration principle applies, it must relate to orders rather than to the actual flow of receipts and inventory investment, and this is typically recognized. But the figures suggest that whatever retailers intend with respect to a specified relation between sales and stock—or probably even between sales and stock plus commitments—they do not achieve it in the short run. Especially puzzling, when considered in the frame of the acceleration principle however broadly conceived, are the regular *short* intervals by which orders often precede sales. The lead of orders relative to sales certainly cannot be explained by the assumption that retailers consistently foretell demand; in view of the irregularities in any single firm's sales, executives seldom even know that a turn has occurred until several months afterward.

But just as no ready-made theory suffices, it is clear that one cannot be tailored to order with only those measurements that we possess. It is necessary to have information about intentions and the conditions that determine the extent to which they can be achieved. To plant this new set of markers, we endeavor to learn in the next two chapters the relevant problems in running a retail shoe store, and how these problems are typically structured and met.