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CHAPTER 5

PATTERNS IN CONSUMER PURCHASES OF SHOES

Could we precisely define a shoe, a purchase, and a consumer, then during each month of each year, the number of shoes purchased by consumers would be an exact quantity; could we also define purchase price, then the number of dollars expended for shoes would similarly be an exact quantity. Change in these amounts during business cycles and its cause is the subject of this chapter.

But unfortunately the real subject is never encountered. We have no direct experience of aggregate shoe sales. The figure must be reconstructed from fragmentary evidence, and we can actually speak only of this construct. In the course of months and years of work with the effigy, one slips inevitably at times into regarding its papier-mâché as flesh and bone. All the more reason to build it with the utmost care.

Estimates of Retail Shoe Sales

DOLLAR SALES

Sufficient information on retail shoe sales is available to provide the basis for monthly estimates beginning in January 1926. How the estimates were made is described in a technical paper on the factors determining consumer shoe buying.[1] Some of the problems that were encountered are discussed, and an attempt is made to evaluate the results. Very briefly, the estimates were constructed in the following way.

Because additional material became available in 1935, the first ten years of the series (1926–1935) were constructed in a somewhat different manner from the rest. The basic data used in the first segment were: (1) sales of shoe departments of department stores collected by the seven Federal Reserve Banks of Boston, New York, Richmond, Cleveland, Chicago, Dallas, and San Francisco; (2) sales of six local independent and chain shoe-store organizations collected by the Federal Reserve Bank of Philadelphia; (3) sales of five large national shoe chains reported to the Federal Reserve Bank of New York; and (4) sales of one large national shoe chain made available directly to the National Bureau of Economic Research. These series were weighted for the relative importance in total shoe sales of the section of the country or type of distribution, or both, and combined in a single index.

Study of the index indicated that the cyclical movements of these data were probably reasonably representative of shoe sales in general. However, the long-run trend certainly was not. Accordingly, the trend of the index was adjusted to the trend of another estimate of retail shoe sales, one that was more reliable as to trend though not as to short-run movements. For this purpose, estimates of annual total shoe sales were constructed for 1926 to 1941 on the basis of monthly census statistics on shoe production, adjusted for net exports of shoes and changes in distributors' inventories (the latter figures were based on inventory statistics of shoe departments in department stores and of shoe wholesalers); the resulting annual figures (1926–1940) for the number of pairs of shoes sold at retail were converted to dollar values by means of an index of the average retail selling price for all shoes sold each year.[2] The ratio was then computed between these annual estimates of total shoe sales and the index of sales of shoe chains and shoe departments; a straight-line trend was fitted to the logarithms of the ratios, and our shoe-sales index multiplied by the ordinates of this trend.

The estimates for the later segment (after 1935) were based on the National Bureau's department-store data for shoe departments and statistics on independent and chain shoe stores collected by the Department of Commerce.[3] The department-store, chain-store, and independent-store statistics were weighted by their relative importance in total shoe sales and used without a trend adjustment. The index was linked to dollar estimates of aggregate sales of shoes by retail stores in 1939; it was based on information from both the *Census of Manufactures* and the *Census of Distribution* in that year. The earlier segment was linked to the later one in 1935.

Seasonal adjustments were made for each component of the index—each Federal Reserve district for the department store data, and for both the chain-store and independent-store indexes. In addition to the adjust-

[1] Ruth P. Mack, *Factors Influencing Consumption: An Experimental Analysis of Shoe Buying*, National Bureau of Economic Research, Technical Paper 10, 1954.

[2] The index is discussed in the next section.

[3] About 100 independent shoe stores and 25 chain organizations reported to the Department in 1936, and the number increased in subsequent years.

ment for usual monthly patterns of sales, corrections were also made for the changing date of Easter and also for the varying number of Saturdays and Sundays in each month.

How closely the estimates achieve the actual values toward which they grope is difficult to say. The earlier figures, particularly those before 1929, are less sure than the later ones. On the whole, it seems probable that the figures give a respectable reproduction of fluctuations in shoe sales, though major ones are more likely to be damped than exaggerated. The general levels of the estimates ought not to be greatly in error.[4]

SHOE PRICES AND SALES IN PHYSICAL UNITS

In addition to a record of the number of dollars that consumers spend on shoes, it is desirable for many purposes to have a record of purchases in physical units. Direct information of this sort is not available. It is necessary, therefore, to divide the dollar estimates by a suitable price index. Such an index might aim at a physical volume measure that is a simple count of all pairs of shoes sold each month, whether open-toed sandal, high work shoe, or street oxford. Alternatively, if a popular-priced open-toed sandal is judged to incorporate markedly less worth than a fine calf oxford, it might seem preferable to convert the number of pairs sold into some sort of *standardized* pair, calling, for example, twenty sandals equivalent to ten oxfords.

The first sort of measure is necessary in order to compare sales at retail with shoe production, since production statistics are obtained directly from shoe manufacturers in the form of a simple count of the number of leather or part-leather shoes turned out. Moreover, the number of things called a pair of shoes that people buy each month or year in the United States has direct meaning and interest in many contexts. But the second concept has uses too. Ideally, it would record changes in purchased shoe utility by converting the utility of the pairs actually sold into fractions or multiples of the utility offered by some standard shoe. Actually, of course, only prices, not utilities, can be compared, and the relationship between relative price and relative utility is highly obscure. Accordingly, all one can do is to aim to measure shoe sales in "standardized pairs," where the process of standardization simply endeavors to convert a measure of change in the sorts of shoes selected to change in the number of a standard combination of shoes of a standard quality; another name for such a series is shoe sales in constant prices.[5] In contrast, for the first physical volume measure—shoe sales in actual pairs—changes in the sorts of shoes selected is accepted without evaluation.

In actuality, how close it is possible to come to the two concepts of the physical volume of shoe sales depends on how closely the available price and sales statistics approach those theoretically necessary. And, of course, they fall very wide of the mark. For the most part, available statistics on the shoe prices aim to record the price of a shoe of unchanged quality. But instead of covering all or a representative sample of shoes that may have had different price histories or changed their relative importance in total production, they of necessity apply to only a few staple sorts of shoes. Starting in 1923, the National Industrial Conference Board has collected monthly statistics from several hundred stores, first for two sorts of shoes and later for four. We are greatly indebted to the Conference Board for making these unpublished statistics available. The Bureau of Labor Statistics has collected information from several stores in each of thirty-four cities for about a dozen shoes, starting in 1935. Figures from these two sources have been combined to obtain an index of shoe prices. When dollar sales are divided by the price index, an index of sales in standardized pairs (or alternately, in constant prices) is obtained. In addition to their paucity, the actual data diverge seriously

[4] See the last section of the appendix in Mack, *op. cit.*, for the development of these evaluations.

[5] Geoffrey Moore has indicated the precise meaning of these several concepts of shoe sales and their bearing on the information about prices and quantities that they require or imply:

(1) Actual pairs $= \sum q_1 = \dfrac{\sum q_1 p_1}{\dfrac{\sum p_1 q_1}{\sum q_1}} = \dfrac{\text{sales in year 1}}{\text{average price in year 1}}$

$$\text{Index, year 0 as base} = \frac{\sum q_1}{\sum q_0}$$

(2) $$\text{In constant prices} = \frac{\sum q_1 p_0}{\dfrac{\sum p_0 q_0}{\sum q_0}}$$

(3) $$\text{Standardized pairs} = \frac{\sum q_1 p_1}{\dfrac{\sum p_1 q_1}{\sum p_0 q_1}} \div \frac{\sum p_0 q_0}{\sum q_0}$$

Expressions 2 and 3 are equal, both being:

$$\frac{\text{Sales in year 1}}{\text{Price index using year 1 weights}} \div \text{average price in year 0}$$

$$\text{Index, year 0 as base} = \frac{\sum q_1 p_0}{\sum q_0 p_0} \text{ (Laspeyres index)}$$

(4) Available estimates of shoe sales in constant shoe dollars $=$

$$\frac{\dfrac{\sum q_1 p_1}{\sum p_1 q_0}}{\sum p_0 q_0} \times \frac{\sum p_0 q_0}{\sum q_0}$$

$$\text{Index, year 0 as base} = \frac{\sum q_1 p_1}{\sum q_0 p_1} \text{ (Paasche index)}$$

from those theoretically required and the deficiencies need to be borne in mind when working with the figures. The statistics apply to staple shoes, and staple shoes may respond to cyclical influences somewhat differently from the high-style shoes now so popular. Also, markdowns or special sales are specifically excluded from the basic reports, and markdowns are substantially more important in years of poor than in years of good business. These and other difficulties probably have the net effect of understating cyclical fluctuation in shoe prices and consequently overstating fluctuation in sales of standardized pairs.

To construct the first type of physical volume measure a price series for the average price at which shoes were actually sold was needed—a record of average sales price. Such a figure for wholesale markets may be based on the biennial *Census of Manufactures* for every other year from 1927 to 1939 inclusive. The *Census of Manufactures* figures were converted to an average retail sales price by raising them by the typical margin between retail and factory price of 41 per cent of retail price (or 69.5 per cent of factory price).[6] Values between the biennial bench-marks were interpolated by the monthly shoe price index. At least some of the shortcomings of this series are obvious: the maintained markup for distribution is not fixed from year to year, but is dependent on business conditions; yet information is not adequate to determine the proper annual figures. Further, the monthly estimates are bound to be seriously in error during periods when considerable trading up or trading down is taking place, for this sort of change is not reflected in the interpolating series. Fortunately it was possible to compare this series with ones of similar principle obtained from two large shoe-chain organizations, and they were found to be in welcome agreement.

The three measures of shoe sales are displayed in Chart 7. It is worthwhile to view carefully the difference between the two types of deflated data since this represents the aspect of typical retail and production statistics that is merely a function of usual differences in how retailers and producers ordinarily report the flow of goods. Sales in actual pairs resemble the sort of physical measure found in many statistics on production. Sales in standardized pairs, on the other hand, is a sample of the genus "sales in constant prices," the use of which is so common in recording consumer takings in "real" terms. By using whichever of the three measures seems appropriate in context, trends and cyclical characteristics of consumer buying of footwear may be examined.

[6] If the margin is 41 per cent of the retail price X, then it is $(0.41X \times 100)/(X - 0.41X)$ per cent, or 69.5 per cent, of the factory price $(X - 0.41X)$.

Trends in Shoe Sales

Table 13 presents annual estimates that show the broad changes over the years in the American consumer's expenditure on shoes. There was a fall in shoe buying, measured either in current or constant prices (columns 1 and 5), between the two peak years 1929 and 1937, but a reversal of the downward trend, even measured in constant prices, took place during World War II. Information from the *Census of Manufactures* can be used to push the picture backward, and in column 2 or 6 of the table we see that the peak year of 1923 was still higher than 1929. Before World War I, however, dollar shoe sales seem to have been subject to an upward trend, and the reversal came some time during or after the war, though this was not apparent when changes in price were allowed for (column 6). For the stretch between World Wars I and II, in any event, shoe sales in either current or constant prices suffered a trend decline.

Since the population of the country has increased, and since the need for shoes is affected by the number of feet to be shod, the downward trend in standardized pairs purchased by the average person is stronger than the aggregate figures show. Per capita purchases in constant prices (last column) declined at the rate of about 2.6 per cent of its average value during the interwar period.[7]

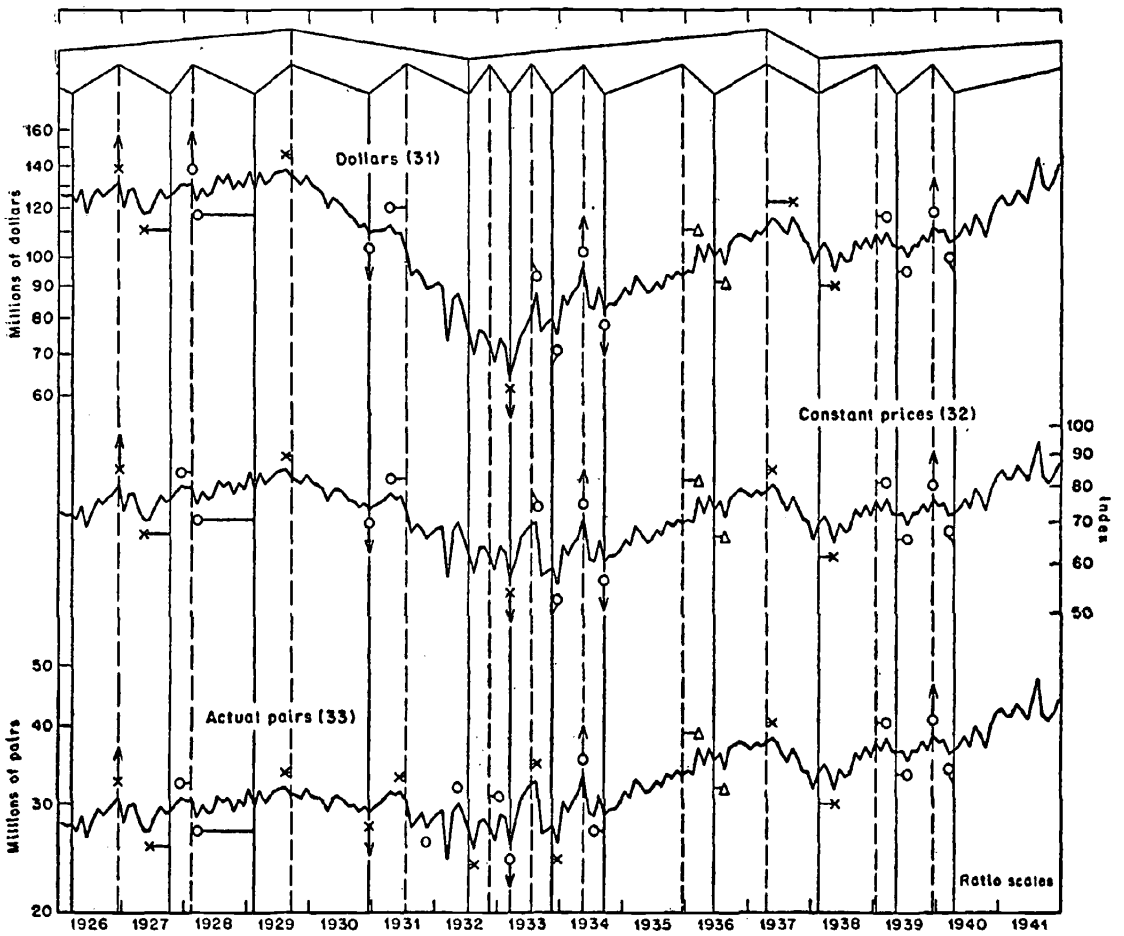
The downward trend in shoe buying might have been associated with a downward trend in all consumer buying or in consumer income. But per capita income adjusted for change in the cost of living did not decrease; on the contrary, it increased, at least in the twenties.[8] Consequently, shoe sales (adjusted for change in the price of staple shoes) must have preempted a decreasing portion of the consumer "real" dollar. This was also true when both sets of figures were compared without the price adjustments: the per cent of disposable consumer income spent for shoes was 2.09 in 1926, 2.08 in 1929, 1.86 in 1937, 1.67 in 1941, and 1.43 in 1948, all years of more or less peak activity. The rise in real income before 1929 and after 1941 would normally be associated with a drop in the proportion of income spent on shoes. At relatively high levels of income, a smaller proportion of income is ordinarily spent on all purchases (a larger proportion saved). Also, since shoes are a more necessary

[7] A straight-line trend was fitted to the production data in column 9 for 1919 through 1939. The equation was $y = \$7.063 - \$0.1857$ per year (counting from 1929). The average per capita output for the period was \$7.06 in 1935–1939 (wholesale) shoe prices, and \$0.1857 is 2.6 per cent of \$7.06.

[8] See Simon Kuznets, *National Income and Its Composition, 1919–1938*, National Bureau of Economic Research, 1941, Table 9, p. 153.

CHART 7

Physical and Dollar Estimates of Retail Shoe Sales, 1926–1941



Peaks and troughs in the *SLH-subcycle* reference chronology are shown by broken and solid vertical lines. The two diagrams at the top of the chart differentiate the SLH-cycle from the SLH-subcycle reference turns.
Specific-cycle turns are marked by ×, specific-subcycle turns by O, and retardations by △. When a specific turn is matched with a reference turn, a horizontal line or vertical arrow indicates the association.
Parenthetic figures after names of series identify their descriptions in Appendix B.

good than many things people buy, they would be likely to absorb a smaller share of all purchases at high levels than at low. Endeavoring to allow for the impact of changes in income, we calculate that between 1929 and 1941 the downward trend was responsible for a drop of about $0.12 a year when sales and income are measured in current dollars, and about $0.19 when both are deflated for their respective price changes. Average per capita sales for the period were in both cases close to $10.00, so that the trend represented about 1 or 2 per cent of the average value each year.[9]

The decline in the proportion of the income dollar spent on footwear was accompanied by a change in the sorts of shoes selected. In spite of the smaller per capita expenditure after allowance for change in the price of staple shoes, the number of actual pairs bought, Table 14 shows, may have increased slightly. This means that the weight of consumer selection moved from higher- to lower-price lines. The table gives estimates of the number of articles called a pair of shoes that were produced (column 2) or sold to a consumer (column 1), both the total number and per capita (columns 3 and 4). Although business depressions seem to have

[9] These figures represent the coefficients of time in the following equations fitted for 1929 through 1941:

$$X_0 = \$2.10 + \underset{(0.0005)}{0.0169}X_1 - \underset{(0.0132)}{0.1177}X_2 \qquad \overline{R}_{1.23} = 0.9952$$

$$X'_0 = \$3.78 + \underset{(0.0005)}{0.0153}X'_1 - \underset{(0.0101)}{0.1894}X_2 \qquad \overline{R}_{1.23} = 0.9936$$

where X_0 is per capita shoe sales, current dollars; X'_0 in 1935–1939 shoe dollars

X_1 is per capita disposable consumer income; X'_1 in 1935–1939 dollars

X_2 is per year (counting from 1926)

TABLE 13

Evidence on Trends in Dollar Shoe Sales, 1909–1949

		IN CURRENT PRICES		RETAIL PRICE OF STANDARD SHOE [c]	WHOLESALE PRICE OF BOOTS AND SHOES [d]	IN CONSTANT PRICES			PER CAPITA IN CONSTANT PRICES	
		Retail Shoe Sales [a]	*Shoe Output* [b]			*Retail Shoe Sales*	*Shoe Output*	POPULATION [e]	*Retail Shoe Sales*	*Shoe Output*
		(*millions*)		(*1935–1939 = 100*)		(*millions*)		(*millions*)		
		(1)	(2)	(3)	(4)	(1) ÷ (3) (5)	(2) ÷ (4) (6)	(7)	(5) ÷ (7) (8)	(6) ÷ (7) (9)
	1909	n.a.	$ 442.6	n.a.	48.4		$ 914.5	87.9		$10.4
	1914	n.a.	501.8	n.a.	55.5		904.1	95.1		9.5
	1919	n.a.	1,155.0	n.a.	132.7		870.4	102.3		8.5
T	1921	n.a.	867.5	n.a.	109.8		790.1	105.3		7.5
P	1923	n.a.	1,000.1	n.a.	97.6		1,024.7	108.4		9.5
	1925	n.a.	925.4	n.a.	99.0		934.7	112.0		8.3
P	1926	$1,512.7	n.a.	120.8	98.5	$1,252.2		113.7	$11.0	
T	1927	1,492.8	931.5	117.1	101.1	1,274.8	921.4	115.0	11.1	8.0
	1928	1,556.4	n.a.	116.9	108.3	1,331.4		116.1	11.5	
P	1929	1,609.8	958.7	115.2	104.7	1,397.4	915.7	117.4	11.9	7.8
	1930	1,437.8	n.a.	110.2	100.5	1,304.7		118.7	11.0	
	1931	1,222.4	650.6	99.9	92.3	1,223.6	704.9	119.7	10.2	5.9
	1932	947.1	n.a.	87.5	84.8	1,082.4		120.7	9.0	
T	1933	908.9	550.5	86.6	88.8	1,049.5	619.9	121.4	8.6	5.1
	1934	1,034.8	n.a.	96.5	96.6	1,072.3		122.1	8.8	
	1935	1,088.5	641.0	95.4	96.5	1,141.0	664.2	122.9	9.3	5.4
	1936	1,224.1	n.a.	96.6	98.3	1,267.2		123.8	10.2	
P	1937	1,318.2	765.4	102.8	103.4	1,282.3	740.2	124.5	10.3	5.9
T	1938	1,215.6	n.a.	103.2	100.7	1,177.9		125.3	9.4	
	1939	1,264.4	731.8	102.0	101.1	1,239.6	723.8	126.3	9.8	5.7
	1940	1,330.8	n.a.	103.3	106.0	1,288.3		127.0	10.1	
	1941	1,543.1	n.a.	107.1	111.8	1,440.8		126.7	11.4	
	1947	3,155.0	1,788.5	191.1	173.7	1,651.0	1,029.6	136.1	12.1	7.6
	1948	3,147.0	n.a.	210.1	186.9	1,497.9		138.0	10.9	
	1949	3,103.7	n.a.	206.4		1,503.7		140.7	10.7	

P and T indicate years in which peaks and troughs occurred in the monthly business-cycle reference chronology of the National Bureau of Economic Research.

n.a. = not available.

[a] Series 31 in Appendix B.

[b] Based on data from the biennial *Census of Manufactures* for the footwear (except rubber) industry. *Prior to 1927:* The figures apply to value of products for the industry. *1927 through 1939:* The value of shoe output in the industry was reported separately, but since it represented about 99 per cent of the industry's products in 1927, the data may be regarded as continuous. *1947:* Information was presumably collected for manufacturers' sales of footwear rather than for output.

[c] Series 8 in Appendix B changed to a 1935–1939 base.

[d] Series 1 in Appendix B changed to a 1935–1939 base.

[e] Total civilian population (*Statistical Abstract of the United States, 1948*, Dept. of Commerce, pp. 9 and 66) corrected for infants under two by subtracting births during the current and preceding year. Estimates for 1909 and 1914 were obtained by straight-line interpolation of census reports for 1900, 1910, and 1920 of male and female population two years of age and over. Whether or not children between the ages of one and two ought to be excluded is debatable.

caused buying to drop to as low as about two and three-quarters pairs a year per person, in prosperous years buying seems to have ranged around three and a quarter or three and a half pairs a year for every man, woman, and child two years of age or over.[10] Over the past forty years the figure may have increased by a quarter of a shoe.

[10] The level of these figures is high, since shoes are sometimes worn by children under two, and in this case these would be included in the statistics on shoe sales or output, while children under two are excluded from the count of population (see Table 13, note e). Had total population been used, the figure would have been too low rather than too high.

The table makes a further statement about the trends of pair shoe sales: it was down for men's and up for women's shoes. The absolute level of the per capita purchases is not correct, since the figures do not include many shoes worn by men and women, but called "athletic" or "misses'," or included in the "other footwear" category; these unavoidable omissions probably cause the table to understate the upward trend in women's shoes especially. Nevertheless the figures announce the score for one aspect of the war between man and woman: compare the prosperous years 1923 and 1939, when total per capita shoe production hap-

TABLE 14

Evidence on Trends in Pair Shoe Sales, 1909–1947

		TOTAL		PER CAPITA		CONSUMER TAKINGS		
		Retail Shoe Sales [a]	*Shoe Output* [b]	*Retail Shoe Sales* [c]	*Shoe Output* [d]	*"Men's Work and Dress Shoes"* [e]	*"Women's Shoes"* [e]	*Ratio of "Men's" to "Women's"* [e]
		(*millions*)				(*per capita*)		
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
	1909	n.a.	285.0		3.24	n.a.	n.a.	n.a.
	1914	n.a.	292.7		3.08	n.a.	n.a.	n.a.
	1919	n.a.	331.2		3.24	n.a.	n.a.	n.a.
T	1921	n.a.	305.1		2.90	1.71	3.02	0.594
	1922	n.a.	n.a.			2.10	2.97	0.738
P	1923	n.a.	373.5		3.45	2.48	3.04	0.848
T	1924	n.a.	n.a.			2.36	2.99	0.823
	1925	n.a.	344.2		3.07	2.15	2.86	0.777
P	1926	341.5	n.a.	3.00		2.13	2.88	0.767
T	1927	347.2	367.1	3.02	3.19	2.16	2.91	0.766
	1928	358.6	n.a.	3.09		2.16	3.03	0.733
P	1929	372.6	376.6	3.17	3.21	2.12	3.21	0.680
	1930	360.4	n.a.	3.04		1.95	3.02	0.660
	1931	354.3	319.6	2.96	2.67	1.75	2.80	0.638
	1932	333.5	n.a.	2.76		1.71	2.80	0.623
T	1933	344.3	355.2	2.84	2.93	1.87	2.91	0.651
	1934	359.3	n.a.	2.94		1.98	3.13	0.637
	1935	388.8	388.5	3.16	3.16	2.07	3.27	0.637
	1936	429.5	n.a.	3.47		2.17	3.52	0.620
P	1937	433.6	425.0	3.48	3.41	2.17	3.72	0.586
T	1938	409.3	n.a.	3.27		2.07	3.64	0.572
	1939	442.1	435.3	3.50	3.45	2.03	3.58	0.570
	1940	457.3	n.a.	3.60		2.01	3.61	0.559
	1941	512.7	n.a.	4.05		2.21	3.71	0.599
	1947	504.8	484.1	3.71	3.56			

P and T indicate years in which peaks and troughs occurred in the monthly business-cycle reference chronology of the National Bureau of Economic Research.

n.a. = not available.

[a] Series 33 in Appendix B.

[b] *1927, 1935, 1937, and 1939:* The figure is the one reported in the biennial *Census of Manufactures* as output of the footwear (other than rubber) industry. *1929, 1931, and 1933:* The reported figure was raised to include other footwear, the quality of which was not stated. The adjustment was made by dividing the value reported for other footwear by an average price based on the relationship between the average price of all shoes and of other footwear for the census years 1927, 1937, and 1939 (48 per cent). *1921, 1923, and 1925:* Annual totals of monthly census statistics of the shoe industry as reported by J. G. Schnitzer (*Boot and Shoe Industry, Statistics,* Dept. of Commerce, Industrial Series 10, August 1944, p. 25). These figures were raised by 6 per cent to adjust for estimated undercoverage based on comparisons in 1927. *1947: Census of Manufactures, 1947,* shipments rather than output.

[c] Column 1 ÷ Table 13, column 7.

[d] Column 2 ÷ Table 13, column 7.

[e] Per man or per woman (Schnitzer, *loc. cit.*). These figures are presumably based on monthly census data adjusted for exports and imports and changes in commercial inventories of finished shoes. Direct estimates of sales may have been used for the later years. The ratio is based on aggregative rather than per capita statistics.

pened to be identical (3.45 pairs)—per capita output of men's shoes (adjusted for changes in inventories) fell from 2.48 to 2.03, while that of women's shoes rose at least from 3.04 to 3.58 pairs. But this cheering (or dismal) report on the battle of the sexes needs interpretation. The average price paid for shoes by women declined considerably more than the price paid by men, so that a man's dollar expenditure for footwear, though it doubtless lost ground in the family budget, lost far less than the pair figures suggest.[11]

[11] The category "men's shoes" (including work and dress shoes) probably represents most of the shoes worn by men. The value of these shoes, as given in the biennial *Census of Manufactures,* constituted 37.2 per cent of the value of total footwear

These broad trends—the declining proportion of income spent on shoes, the declining number of standardized pairs of shoes purchased per capita, and the steady, or even increasing, sales in actual pairs (increasing certainly in the field of women's fashionable shoes)—are the result of fundamental changes in techniques of production and distribution, in values, and in ways of life. The demand for shoes associated simply with wear and tear has probably decreased, but the demand prompted by interest in fashion has increased.

Many things have contributed to the decreased demand due to wear and tear. Improved techniques in tanning, and perhaps in shoe manufacture, have increased the life in a comparable pair of shoes; better repair service has done likewise. Farmers probably use up a pair of shoes more rapidly than city people, and there has been a shift of population toward cities. Growing children are notoriously hard on footwear, and our population has aged. Finally, wear and tear on tires have replaced a substantial amount of wear and tear on shoes. The increasing demand for footwear as a decoration, on the other hand, is doubtless associated with analogous trends in other clothing. In part it may reflect a rising level of living; in part, as both cause and effect, it is associated with the more frivolous and attractive shoes that the industry has offered at a price that permitted several pairs of shoes to fit into a place in the budget formerly pre-empted by one or two pairs.

These changes in the industry's offerings were due to several developments. New mechanical and managerial techniques made it possible and profitable for some firms to cater to the new directions in consumer demand. Improved methods of tanning produced cattle-hide leathers that were light and soft enough to use where formerly the more expensive calf- or kidskins would have been required, thus making it possible to supply light shoes at the price of clumsy ones. Leather substitutes have served the same function. The advent of the large chain distributor and his associated manufacturers, operating in the broad and deep field of relatively low-priced shoes, may even have introduced differential change in the value purchased in a high- and a low-priced shoe. The chronic overcapacity in the industry and the large number of small firms furthered a situation in which competition could easily run to attempts to alight on a "hot" design, which, catching the consumers' fancy, would for a season or so cause a sparsely used plant to buzz.

These broad trends in consumer buying, both quantitative and qualitative, cannot help but affect the problems faced by the industry. The shoe industry is an old one, and it is not surprising to find that it has probably passed the point of inflection of its curve of growth.[12] It is perhaps especially interesting to find this slackening rate of growth in an industry that produces an essential article, indeed one that has experienced enhancement of at least one of its appeals—style. The critical point, and one this industry shares with most, is that it produces only one sort of utility, one that must compete with all the new ideas of each generation. A second characteristic of the trend in the shoe industry, which must be likewise shared by many, is the fact that the trend for the industry as a whole is an average of divergent ones for various branches of the trade or parts of the country. In many contexts, it is the trend for the particular product or section that is the relevant fact. For example, business in play shoes and in the South has boomed, while business in women's staple oxfords and in New England has declined; and firms in these several fields have fared differently. A third aspect, which again is not peculiar to this industry, is a part of the interproduct difference in trends: the rise of high-style goods at the expense of staples. To anticipate later chapters, it might be hard to say how the trend in total shoe sales has colored the problems dealt with in this book, but it is very clear that the increasing importance of high-style merchandise has influenced them very considerably.

Fluctuations in Consumer Shoe Buying

We learned in Chapter 3 that consumers bought more shoes as business improved during cyclical expansion and decreased their buying as business fell off during contraction. The index of conformity of dollar shoe sales to business cycles, as ordinarily computed by the National Bureau, is +60,[13] which means in this case that in one of the five phases covered by the data, the contraction between 1926 and 1927, shoe sales fail to conform. Inspection of Chart 2 (Chapter 3) indicates that this results from the early 1927 trough in shoe sales rather than from the absence of a specific contraction in the general neighborhood of the refer-

in 1919. The next figure that is provided applies to 1927, by which time it had dropped to 32.1 per cent. With some ups and downs, it drops to about 31.5 per cent in the last decade. The category "women's shoes" rose from 38.7 per cent in 1919 to 42.3 per cent in 1927, and then rose only one or two percentage points thereafter. But in later years the number of "misses'" shoes and "other" shoes worn by women has increased, and output of these shoes has increased considerably. It seems safe to conclude, therefore, that the dollar value of women's shoe buying has increased relative to that of men's. What its status is relative to children's footwear, one cannot say.

[12] For the character of these curves, see Arthur F. Burns, *Production Trends in the United States since 1870,* National Bureau of Economic Research, 1934.

[13] See Appendix A, sec. 13.

ence phase. This is true, Chart 7 shows, whether shoe sales are measured in dollars, in actual pairs, or in standardized pairs.

TIMING OF MAJOR TURNS

At the 6 business turns covered by our data, retail sales of pairs of shoes led at 3, lagged at 2, and synchronized at 1; and the average timing was −1.5 months. Because retail shoe prices share with most retail prices the tendency to lag, dollar sales lagged pair sales at 2 of the turns; the count for dollar sales was 2 leads, 3 lags, and 1 synchronous, and the average timing was +1.2. But in both cases, the departure from average synchronous timing is not significant. Two statements, however, do seem warranted. First, retail sales of shoes measured in pairs do not turn later than general business. Second, at the turns where considerable change in price took place, because of the characteristic lag in prices there was a tendency for pair sales either to turn or to retard their rate of change prior to the turn in dollar sales.

Preliminary study of some forty-five time series relating to consumer buying available in the National Bureau's files suggests that sales of shoes are not peculiar in either of these respects. Thirteen of the series relate to physical volume measures and the rest to dollar statistics. The former lead in 42, are synchronous in 9, and lag in 49 per cent of the timing comparisons for which specific turns can be matched with the business-cycle reference chronology. Clearly, then, these data show no systematic tendency to move ahead of or behind general business. The corresponding figures for the thirty-two dollar series are 26, 21, and 53 per cent; in these some tendency to lag is suggested. A great deal more work on these data would be necessary to clarify and amplify these tentative observations. In the meantime it is well to refrain from considering the lag that has sometimes been observed in retail statistics (reported in current prices) as a characteristic of consumer buying vis-à-vis production (usually reported in physical volume).

TABLE 15

Influence of Units of Measurement on the Amplitude of Specific Cycles in Shoe Sales, 1926–1938

	ACTUAL PAIRS [b]		STANDARDIZED PAIRS [c]		DOLLARS [d]	
SPECIFIC CYCLE PHASE [a]	*Duration (months)*	*% Fall or Rise* [e]	*Duration (months)*	*% Fall or Rise* [e]	*Duration (months)*	*% Fall or Rise* [e]
Contraction (1926–1927)	6	−6.4	5	−7.0	5	−6.5
Expansion (1927–1929)	26	+13.1	27	+17.1	27	+15.8
Contraction (1929–1933)	36	−15.4 [f]	52	−33.4	43	−60.2
Expansion (1933–1937)	57	+33.4 [f]	41	+28.1	54	+45.6
Contraction (1937–1938)	12	−14.2	12	−16.3	8	−13.4
All Phases (1926–1938)		82.5		101.9		141.5
Average per phase		16.5		20.4		28.3

[a] The years given in parentheses are those in which the initial and terminal peaks or troughs occurred with a single exception (see note f). For each series, the monthly turning dates are given in notes b, c, and d.

[b] Series 33 in Appendix B. The turning points are: peak—December 1926; trough—June 1927; peak—August 1929; trough—August 1932; peak—May 1937; and trough—May 1938.

[c] Series 32. The turning points are: peak—December 1926; trough—May 1927; peak—August 1929; trough—December 1933; peak—May 1937; and trough—May 1938.

[d] Series 31. The turning points are: peak—December 1926; trough—May 1927; peak—August 1929; trough—March 1933; peak—September 1937; and trough—May 1938.

[e] The standing at peak or trough month was calculated as a centered three-month average. For each phase, the total fall from peak to trough (or rise from trough to peak) was divided by the average standing for the full cycle.

[f] The trough in actual pairs occurs not in 1933 but in August 1932.

AMPLITUDE OF MAJOR SWINGS

To assess the vigor with which shoe sales fluctuate with the business tides, Table 15 compares the amplitude phase by phase for each of our three measures. Fluctuations are much more marked when measured in current dollars than when they are expressed in physical measures. This is a corollary of the fact that shoe prices move in consonance with business activity. As to the two physical measures, the tendency for consumers to buy not only more, but more expensive, shoes when conditions improve and conversely to "trade down" when conditions deteriorate during business recession causes the amplitude of the swings for actual pairs to be less than for standardized pairs.

It would also be interesting to view shoes in the perspective of other goods sold to the final consumer. When business improves, do consumers tend to expand their purchases of footwear more or less vigor-

ously than those of other goods? To answer this question, we would want to compare the specific-cycle amplitude of shoes with other consumer commodities, making sure that our data apply to the same group of purchasers.

Unfortunately, no such figures exist on a monthly basis. Monthly information on retail sales of different commodities going back earlier than 1935 apply mainly to sales of different sorts of stores. Not only do these institutions typically sell to different income classes or occupational groups, but they are subject to trend and erratic influences that introduce so many variables other than the character of their wares that the information is virtually useless for our purpose. However, one set of materials has been developed for this study that seems to concentrate on differences among commodities.

Information concerning the sales of several departments of department stores can be assembled. In Table 16 the specific-cycle amplitudes of eight departments are compared. The message of the table is a general one: the great sluggish aggregate, consumer purchases, is composed of many streams, some highly sensitive to business conditions and others almost wholly insensitive. The average cyclical amplitude of furniture sales is about two and a third times that of drug and toilet article sales. Shoes seem to occupy a more or less central position in the hierarchy; indeed, there is a similarity between the cyclical amplitude of shoe department sales and that of total department store sales.

These monthly figures may be compared with the annual estimates prepared by the Department of Commerce, which cover the whole gamut of consumer ex-

TABLE 16

Cyclical Amplitude of Sales of Eight Departments of Department Stores, 1927–1938

	TOTAL AMPLITUDE DURING SPECIFIC-CYCLE PHASES RELATED TO THE BUSINESS-CYCLE CHRONOLOGY [b]								AVERAGE AMPLITUDE PER MONTH [c]	
	Expansion 1927–1929		*Contraction 1929–1933*		*Expansion 1933–1937*		*Contraction 1937–1938*			
DEPARTMENT [a]	*Duration (months)*	*Per Cent Rise (+)*	*Duration (months)*	*Per Cent Fall (−)*	*Duration (months)*	*Per Cent Rise (+)*	*Duration (months)*	*Per Cent Fall (−)*	*All Four Phases*	*Last Three Phases*
Furniture [d]	[e]	[e]	40	−70.3	50	+74.0	13	−35.1		1.74
Floor coverings [f]	[e]	[e]	41	−69.5	50	+63.5	13	−38.4		1.65
Men's clothing, total [g]	7	+3.2	52	−60.4	48	+48.4	14	−21.5	1.10	1.14
Total dept. store sales [h]	17	+5.9	42	−50.5	50	+46.2	12	−14.3	0.97	1.07
Shoes [i]	27	+18.7	43	−53.8	54	+42.1	8	−11.7	0.96	1.02
Hosiery [j]	[e]	[e]	40	−60.2	54	+38.0	8	−0.8		0.97
Notions [k]	[e]	[e]	46	−46.1	49	+43.4	14	−8.3		0.90
Men's furnishings [l]	[e]	[e]	48	−47.2	48	+34.2	14	−8.9		0.82
Toilet articles and drugs [m]	[e]	[e]	26	−27.8	48	+27.7	9	−6.2		0.74

[a] The series for each department were computed by the National Bureau of Economic Research from data on district sales of departments of department stores supplied by between five and seven Federal Reserve district banks. The banks of New York, Cleveland, and San Francisco were able to give data in all cases. In addition, information for furniture departments was obtained from the Boston, Richmond, and Chicago banks, and on floor coverings, from all of these except Boston. For men's clothing, hosiery, and men's furnishings, the additional banks were Boston, Richmond, and Dallas. For notions and for toilet articles and drugs, the additional banks were Chicago and Dallas. For shoes (see Appendix B, series 27) all seven banks contributed departmental information, and Philadelphia gave figures for specialty stores.

[b] Turns in the NBER monthly business-cycle chronology (unrevised, as given in Arthur E. Burns and Wesley C. Mitchell, *Measuring Business Cycles*, NBER, 1946, Table 16), which provides the reference frame, occurred in each of the initial and terminal years of expansion or contraction given in the column heads. Specific-cycle turns related to these reference turns under our timing rules (see Appendix A, sec. 10b) bound the period for which the duration and amplitude is given in the table. These dates are given in the notes to each series.

Amplitude was calculated as in Table 15, note e.

[c] In effect, this calculation weights each phase amplitude by its duration and divides by the total number of months.

[d] The specific turns related to the business-cycle turns are: peak—October 1929; trough—February 1933; peak—April 1937; and trough—May 1938.

[e] No specific trough was related to the reference trough in 1927.

[f] The specific turns related to the business-cycle turns are: peak—September 1929; trough—February 1933; peak—April 1937; and trough—May 1938.

[g] The specific turns related to the business-cycle turns are: trough—April 1928; peak—November 1928; trough—March 1933; peak—March 1937; and trough—May 1938.

[h] Based on twelve districts, *Federal Reserve Bulletin*, Board of Governors of the Federal Reserve System, June 1944. The specific turns related to the business-cycle turns are: trough—April 1928; peak—September 1929; trough—March 1933; peak—May 1937; and trough—May 1938.

[i] The specific turns related to the business-cycle turns are: trough—May 1927; peak—August 1929; trough—March 1933; peak—September 1937; and trough—May 1938.

[j] The specific turns related to the business-cycle turns are: peak—November 1929; trough—March 1933; peak—September 1937; and trough—May 1938.

[k] The specific turns related to the business-cycle turns are: peak—April 1929; trough—February 1933; peak—March 1937; and trough—May 1938.

[l] The specific turns related to the business-cycle turns are: peak—March 1929; trough—March 1933; peak—March 1937; and trough—May 1938.

[m] The specific turns related to the business-cycle turns are: peak—January 1931; trough—March 1933; peak—March 1937; and trough—December 1937.

penditures since 1929 and are built up from a wide variety of sources. They are grouped here into thirteen main categories. Because of their comprehensive character, they are worth examination even though they are annual figures and, consequently, untrustworthy indicators of cyclical sensitivity. Table 17 compares perhaps the most obvious fact brought out by the table is the reduction (relative to the dollar values) in cyclical amplitude for all commodities.[15] Nevertheless, it is clear that the "real value" of large classes of goods used by American consumers is subject to a reduction (or rise) of at least 5 per cent a year as between years

TABLE 17

Cyclical Amplitude of Groups of Consumer Expenditures, Annual Data, 1929–1941

EXPENDITURE GROUP [a]	CURRENT PRICES			1929 PRICES [b]		
	Average Expenditure 1929–1941 (billions)	*Average Amplitude per Year [c] (per cent)*	*(rank)*	*Average Expenditure 1929–1941 (billions)*	*Average Amplitude per Year [c] (per cent)*	*(rank)*
Auto total expense	$ 4.53	14.8	1	$ 5.40	11.6	2
Furnishings and equipment	3.74	14.2	2	3.85	9.8	3
Recreation	2.51	12.9	3	2.60	12.4	1
Clothing	7.70	11.6	4	9.81	6.9 [d]	6
Food	17.52	11.3	5	22.78	5.4 [d]	10
Shoes	1.24	10.9	6	1.39	6.1	7
Household operation	2.75	9.5	7	3.15	5.9	8
Personal care	0.94	9.1	8	1.08	7.3	5
Medical care	2.66	8.0 [d]	9	3.10	3.0 [d]	13
Reading	0.72	7.6	10.5	0.74	7.5	4
Education	0.60	7.6 [d]	10.5	0.70	5.2 [d]	11
Tobacco	1.59	7.1 [d]	12	1.74	5.5 [d]	9
Housing	9.05	6.5 [d]	13	10.35	0.2 [e]	14
Fuel, light, refrigeration	2.68	3.9	14	2.86	3.4	12

[a] Group expenditures were compiled from data in "National Income and Product Statistics, 1929–1946," *National Income Supplement, July 1947, Survey of Current Business*, Dept. of Commerce. For shoe expenditures in current prices, I used series 31 in Appendix B; for 1929 prices, series 32 on the 1929 base.

[b] For method of deflation, see text note 14.

[c] For each expenditure group, the specific peak and trough years associated with business-cycle peak and trough years were selected. Annual figures for this sequence of peak and trough years were compared, and rises during expansions added to falls during contractions. The total amplitude for the three cycle phases between 1929 and 1938 was expressed as a percentage of the average value of the series and divided by the number of years covered.

[d] Two phases only; no 1937–1938 movement.

[e] One phase only: 1929–1933.

(column 2) the average cyclical fluctuation per year of each class of good for the three cycle phases between 1929 and 1938. Sales of shoes are again almost in the middle of the array. They vary slightly less than sales of clothing as a whole. Impressive differences appear among various broad categories of goods in their sensitivity to business fluctuation. Needless to say, were the categories broken down into minor subdivisions, the differences would be much larger. In the last three columns, each commodity group is adjusted in a rough fashion for change in price.[14] Shoe sales still occupy a central spot in the array. But of expansion or contraction; monthly data would of course show considerably greater amplitude. The in-

[14] The adjustments were made in 1948 on the basis of the then available data. Dollar figures for expenditures on house furnishings, clothing, food, fuel and light, tobacco, housing, recreation, and reading were divided by the National Industrial Conference Board price index bearing a similar title, and personal income was deflated by the NICB cost-of-living index. Expenditure for household operation was divided into (1) laundry and domestic service and (2) other household operations. The former group was deflated by a price index based on average earnings per full-time employee in private household service industry; the latter group, which includes telephone, cleaning, and polishing preparations, was left without any price adjustment. Automobile expenditure was divided into two groups: auto purchase, which was adjusted using the Bureau of Labor Statistics index of price of passenger cars; and auto expenditure, which was adjusted by the American Petroleum Institute retail price of gasoline in fifty cities. Personal care was divided into (1) expenditure on toilet articles and preparations, which was adjusted by the NICB index of price of drugs and toilet articles, and (2) other personal care expenditure, which was adjusted by the average annual earnings per full-time employee in personal service industries. To deflate medical care and education, the NICB cost-of-living index was used, since no appropriate price index was available, and this procedure seemed preferable to making no adjustment for price.

[15] The fairly central position of food when amplitudes are based on current prices seems odd, since food is often thought of

teresting and marked exception is housing, which, as measured, changes not at all.

SUBCYCLES

In addition to major movements corresponding to generally recognized business cycles, shoe sales display the shorter or slighter movements that appear in the SLH-subcycle reference chronology; pair sales have all of them, dollar sales all but one.[16] Nevertheless, conformity indexes are only +67 and +62 for pair and dollar sales, respectively, because of the relatively small amplitude of subcyclical relative to erratic fluctuation, and small differences between specific and reference timing. Table 10 showed 86 per cent of the turns in pair sales and 74 per cent of those in dollar sales coming within two months of the reference-subcycle scheme. Lags are slightly more frequent than leads, but the average timing is virtually synchronous, +0.3 month for pair and +0.5 for dollar sales. In general, then, it is clear that consumer buying of shoes moves with both the major and lesser fluctuations that characterize the shoe, leather, hide industry as a whole.

But the relative importance of the major and minor swings is quite different for dollar and physical volume measures. To study the matter, we compare for a given series the amplitude during all specific *subcycles* with that associated with "major" specific *cycles* only —those defined by peaks and troughs associated with the *cycles* in the industry (SLH-cycle reference chronology). The usual measures of specific amplitude described in Appendix A are used; they sum for all specific subcycles (or for specific cycles only) the rise from trough to peak and the fall from peak to trough, express it as a ratio to the average value of the series, and divide by the number of months covered.

For the three time series on sales of shoes recorded in current dollars, in standardized pairs, and in actual pairs, the specific-subcycle amplitudes per month are 1.29, 1.29, and 1.28 respectively. The major specific-cycle amplitudes per month are 1.00, 0.76, and 0.64. Thus, major cycles account for 78 per cent, 59 per cent, and 50 per cent of the total recognized fluctuations per month in the three series. The major swings in the undeflated measure are greater than in the deflated measures because shoe prices have major, and only occasionally minor, movements.[17] The major movements were relatively weaker in actual pairs than in standardized pairs because of the heavier selection of cheaper shoes during major depressions, and of better shoes during major expansions; this caused purchases in actual-pair sales to fall less in contraction and rise less in expansion during major movements than purchases in standardized pairs. It seems likely that this trading up and down does not play an important part in the minor movements.

Shape of Fluctuations

The fluctuations that are so evident in consumer shoe buying would have a somewhat different meaning if they tended to retard before they reversed, rather than to rise or fall at a generally constant or even increasing rate up to their final peaks or troughs. Retardation would express some weakening of the forces of expansion or contraction prior to their turn. Such weakening at the level of consumer buying may have further ramifications at earlier stages in the vertical chain. These implications have been developed by J. M. Clark and others as the "acceleration principle." We find them in several forms in the shoe, leather, hide sequence. Consequently, it is necessary to search carefully—indeed, to the point of tedium—for evidence on the shape of fluctuation. Does a rise or fall in consumer buying tend to retard before it ceases? If so, at what section of the upward (or downward) bank does the fall in the rate of rise (or fall) set in?

One possibility can be ruled out immediately—that the *major* business movements rise in some uniform fashion toward their peak and fall in a similar manner toward their trough. The presence of the minor waves on some and not on other major banks precludes this possibility, and a glance at Chart 7 confirms this. The statement holds whether we consider shoe sales during SLH reference cycles—the grid designated by the upper triangular diagram—or during specific cycles in sales.

But if the minor waves introduce an erratic shape to major banks, how about the minor banks themselves; does their course follow a similar pattern from one movement to the next? Chart 7 indicates that rounded movements, in which waves conform to the segments marked off either by the SLH-subcycle reference chronology or by the specific-cycle peaks and troughs, are

as one of the more stable forms of expenditure. The deflated figures, in which food moves well down the list, suggest a reasonable explanation: dollar expenditure for food varies considerably over the cycle because food prices vary more than the prices of most other consumer goods.

[16] Specific subcycles marked in pair sales correspond to those marked in the industry chronology with one additional one—the movement between 1931 and 1932. For dollar sales, the short wave at the close of 1932 has not been marked.

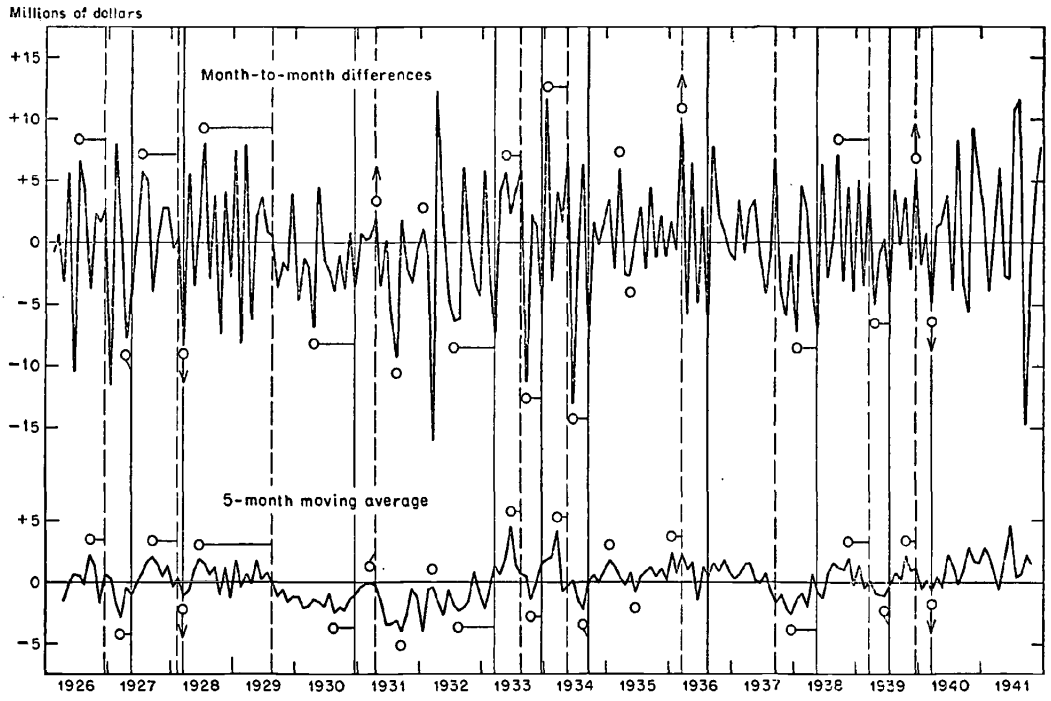
[17] In view of the reduced major fluctuation, it is surprising, perhaps, that the total recognized variation was the same in the current dollar and deflated series. It is due, at an arithmetic level, to the fact that deflation causes what are, in effect, retardations in the dollar series to appear as ups and downs, thus compensating for loss in amplitude of major swings by gain in that of minor swings.

certainly not an evident characteristic of the series. The eye is confused by the saw-tooth shape of random movements, and we must find ways of assisting vision to detect the underlying shapes.

The most direct approach would seem to be to compute a first difference series (since it is rates of change that we need to understand) and identify and study its subcyclical patterns. A five-month average was used to help locate subcyclical movements in the first differences. It was not used in locating the month when the turn occurred.[18] The series is shown in Chart 8, where its subcycles can be compared with those of sales proper by means of the vertical grid.

CHART 8

Month-to-Month Differences in Dollar Shoe Sales, 1926–1941



Specific-subcycle peaks and troughs (broken and solid vertical lines) in *dollar shoe sales* (series 31 in Appendix B) are used as reference frame.
Specific-subcycle turns in first differences are marked by O. When a specific turn is matched with a turn in the reference series, a horizontal line or vertical arrow indicates the association.
The moving average of monthly first differences is centered.

Patterns for first differences bear a definite arithmetic relation to those for sales. Consider first the triangular shape for sales. Were the course of sales perfectly smooth, first differences would be a broken horizontal line above the axis during expansion and below during recession. A random component added to sales would tend to place a peak in first differences with equal probability anywhere during the expansion phase and a trough anywhere during a contraction phase. However, since turns were chosen at high and low months in sales proper, there is a tendency for random highs and lows to occur at these times. The same tendency must then appear in rates of change. If, on the other hand, sales moved in rounded waves of some sort, there would be a tendency for the peaks in first differences to occur more frequently at one time during expansion than at others—around the middle if the pattern were sine-like, or toward the end if retardation simply preceded the fall—and the same would be true of contractions.

Table 18 supplies a crude test of the behavior of the actual data by dividing each specific-subcycle phase in shoe sales proper into three equal parts and noting in which third the turns in first differences occur. It indicates little tendency for peaks and troughs in first

[18] Turns are selected at the most extreme point except when there is reason to ignore it because of an immediately preceding or following extreme month of the opposite sign, or an alternative month which, though not as extreme, is surrounded by other moderately extreme months of like sign. These procedures are similar to those used in locating turns other than in first difference series.

differences to concentrate in any one third of the corresponding phase of sales proper. However, division of the phases according to their length brings out a sharp contrast. For phases of six months or more, there does seem to be concentration in the center third. For the short phases, turns fall in first and last thirds, frequently in the first or last month, toward which they are drawn by the bias associated with the selection of turns at high and low points in sales five-month average. Certainly, this clarifies the waves in rates of change. It also clarifies the lead of first differences relative to sales proper; sixteen comparisons out of eighteen lead. Here again a bias interferes with the meaningfulness of the result: there is a tendency for turns in averages of first differences to avoid the month when months of opposite phase enter the average. For a centered three-month average this occurs one month before the terminal turn, so that a peak

TABLE 18

Number of Turns in Monthly First Differences in Shoe Sales Falling in Different Periods of Subcyclical Phases of Sales Proper, 1926–1940

	Total [a]	*First Month* [b]	*First Third* [c]	*Second Third* [c]	*Last Third* [c]	*Last Month* [d]	*Mean Lead (−) or Lag (+) (months)*
				ALL PHASES			
Sales in:							
Dollars (31)	18	5	6	4	8	5	−4.0
Pairs (33)	18	4	6	6	6	5	−2.8
				PHASES OF FIVE MONTHS OR LESS			
Sales in:							
Dollars	10	4	5	0	5	4	−1.7
Pairs	9	3	5	0	4	4	−1.8
				PHASES OF SIX MONTHS OR MORE			
Sales in:							
Dollars	8	1	1	4	3	1	−7.2
Pairs	9	1	1	6	2	1	−3.9

[a] Includes only turns in first differences that are matched with turns in sales proper.

[b] The month just after the previous opposite turn in sales proper. It leads the corresponding turn by one less than the number of months in the phase duration.

[c] When the number of months in the phase is not evenly divisible by three, the extra one month is placed in the second third or the extra two months are placed one in the first and one in the last third.

[d] The month that synchronizes with the corresponding turn in sales proper.

proper. For short phases, then, random factors dominate, so that the shape of sales cannot be said to differ from that of an underlying triangular pattern; for longer phases, on the other hand, there does appear to be some tendency for the location of peaks and troughs in monthly first differences to be consistent with rounded shapes of subcycles in sales, which start to slacken toward the middle or later part of the phase. But the jagged character of the monthly rates of change militates against a firm conclusion.

If the saw-tooth edges of the data are judged to be the result of factors not relevant to the questions at hand (such as the smallness of the sample, faulty seasonal adjustment, weather, or style changes), they may be at least partially eliminated and the data reexamined. Accordingly, monthly first differences in sales are shown in Chart 8 smoothed by a centered (or trough) in these averages has more chance of falling two or more months before the peak (or trough) in sales proper than it does later. The length of the "turn-resistant" period increases with the term of the average. Table 19 shows, however, that the length of the actual lead does not vary for averages of different term as it would if the bias associated with the term of the average were a strong determinant of the location of turns. We see, simply, a repetition of the statement found in the month-by-month data that turns in first differences precede those of sales proper.

The removal of some of the eccentric characteristics of month-to-month change by averaging may also help to show where in the rising and falling banks the true turns occur. In part, the location of turns in averaged first differences will be a function of the bias mentioned in the previous paragraph, which tends to

TABLE 19

Turns in Moving Averages of Monthly First Differences in Pair Shoe Sales Compared with Turns in Sales Proper, 1926–1940

Term of Average (months)	*Matched Turns (number)*	*Mean Lead (−) or Lag (+) (months)*
	ALL PHASES	
Three	20	−3.3
Five	20	−2.8
Seven	18	−3.2
	PHASES OF FIVE MONTHS OR LESS	
Three	10	−2.2
Five	10	−1.5
Seven	9	−1.9
	PHASES OF SIX MONTHS OR MORE	
Three	10	−4.4
Five	10	−4.0
Seven	9	−4.6

Source: See series 33 in Appendix B for description of the pair shoe sales series. The moving averages are centered.

draw turns away from terminal and initial months of a phase in sales proper. There is a tendency, then, due to arithmetic rather than to the characteristics of consumer buying to push turns, especially in fairly short phases, toward the center of the phase. To avoid this bias we simply ignore the turn-resistant months in each phase and divide the rest into three parts as nearly equal in length as possible.[19] If the pattern of sales were triangular with a random component, the turns would occur with equal probability in any one of the adjusted thirds (though there are faint biases tending to throw them in the first month of the first third and the last month of the last third, which may be called "turn-prone" months).[20] Unfortunately, since this method loses many observations—the more the longer the term of the average—only a centered three-month average can be profitably used; comparisons can be made for phases lasting five months or more, of which there are sixteen. Turns fall in the discarded turn-resistant months in three cases, in the first or last third in seven cases (all in the first and last—the turn-prone—months) and in the center third in five cases. For phases six months or longer, of which there are eight, turns fall in the first or last third in three cases (all in the turn-prone months) and in the center third in five cases. I conclude that when the device of a moving average is used to moderate the obscurity of the random component, the lead of first differences seems to persist. Likewise it provides tender support for the presence of retardation toward the central portions of at least the longer phases.

The National Bureau's standard nine-point patterns avoid some of the awkward characteristics of both the monthly data and the moving averages, and provide summary descriptions of the shape of subcycles. Because of the brevity of many phases and the choppy character of the sales series, a good bit of their power as a smoothing device [21] is lost when they are applied to subcycles. Nevertheless, patterns for pair and dollar shoe sales were computed in each of three ways; the measuring rod with which to mark off subcycles in retail shoe sales and to locate each of the nine points for each subcycle was taken first as the SLH-subcycle reference chronology, second as specific cycles in sales, third as specific cycles in a five-month moving average of sales (the purpose here was to avoid the bias of random highs at peaks, and lows at troughs). The change between the standing for Stages I and II, for II and III, etc., was calculated and ranked from one to four for each expansion and each contraction, and the rank standings averaged for each stage interval. Since the fastest rates for conforming movements were ranked one, a low average figure points to where change tended to be most rapid and a high one to where it was slow. But as Table 20 shows, the figures are not well differentiated. Significant differences appear for expansion when stages are marked by the reference chronology, and for contractions when they are marked by the five-month moving average of shoe sales. In these four cases, the fastest rate of change occurs in

[19] I am indebted to Geoffrey Moore for suggesting this test. We plot change from the previous to current month at the same point as sales during the current month. For month-to-month change, then, the last observation of, say, expansion—the one occurring in the same month as the peak in sales proper—includes no month of contraction. At the beginning of the expansion, this would be true of change plotted in the month just after the trough; relative to the following peak, this month would lead by one less than the number of months (L) in the phase. For a centered three-month moving average, the synchronous month at the end includes one month of recession, and the last month that does not resist turns is therefore the one before the peak, -1; the first is $L - 2$. For centered five-month averages, the corresponding figures are -2 and $L - 3$. All months with shorter leads at the end or longer at the beginning of the phase we call turn-resistant. Thus for, say, a three-month average in a nine-month phase, months with a timing of zero and -8 are ignored. The remaining seven months are allotted to thirds as nearly equal in length as whole numbers permit.

[20] The random factor previously mentioned—associated with the selection of turns in sales proper at absolute high and low points—would produce a lessened tendency here, for a high month to occur one month earlier at the end of the phase and one month later at the beginning than the last month in the average when a month of opposite phase entered. In addition, the month situated just to the inside of the initial and terminal turn-resistant months might be more likely than others to be selected as a turn—the competition just before (at the beginning of phase) and just after (at the end of the phase) is less severe. On two counts, then, there might be some tendency for turns to occur in these months, which are the first and last months of the first and last thirds as described in the previous note.

[21] See Appendix A, secs. 17 and 18. Phases of less than four months were omitted.

TABLE 20

Interstage Rates of Change in Nine-Point Patterns for Subcycles in Shoe Sales, 1926–1940 [a]

SHOE SALES	NUMBER OF PHASES: Expansion (1)	NUMBER OF PHASES: Contraction (2)	AVERAGE OF RANK POSITION FOR INTERSTAGE RATES OF CHANGE: Expansions: Stage I to II (3)	Stage II to III (4)	Stage III to IV (5)	Stage IV to V (6)	Contractions: Stage V to VI (7)	Stage VI to VII (8)	Stage VII to VIII (9)	Stage VIII to IX (10)	SIGNIFICANCE TEST FOR RANK POSITION [b]: Expansion (11)	Contraction (12)
STAGES MARKED BY SLH REFERENCE CHRONOLOGY												
Dollars (31)	11	11	3.36	1.64	2.14	2.86	2.18	2.95	2.23	2.64	s. at 1%	n.s.
Pairs (33)	11	11	3.27	1.55	2.09	3.09	2.00	2.82	2.36	2.82	s. at 5%	n.s.
STAGES MARKED BY SPECIFIC CYCLES IN SHOE SALES												
Dollars	8	8	2.81	2.31	2.19	2.69	1.94	3.00	2.81	2.25	n.s.	n.s.
Pairs	10	10	2.05	2.40	3.25	2.30	2.05	2.50	2.75	2.70	n.s.	n.s.
STAGES MARKED BY SPECIFIC CYCLES IN CENTERED FIVE-MONTH AVERAGE OF SHOE SALES												
Dollars	7	8	2.50	2.29	2.71	2.50	3.38	1.88	1.88	2.88	n.s.	s. at 5%
Pairs	9	10	2.89	2.28	2.61	2.22	3.00	1.85	2.00	3.15	n.s.	s. at 5%

[a] In each section of the table, subcycles and the nine stages of each subcycle in shoe sales are delineated in the manner indicated. For each subcycle, the standing at the initial trough (Stage I), the peak (Stage V), and the terminal trough (Stage IX) are centered three-month averages of sales. The rest of the expansion months are divided into three parts as nearly equal as possible and the average for each part give standings for II, III, and IV. Analogous calculations for contractions yield standings for VI, VII, and VIII. Change between each two successive stages is averaged for all subcycles (for a further description of this process and of the nine-point patterns themselves, see Appendix A, secs. 17 and 18).

[b] The rank position for the four interstage rates of change was considered not significant (n.s.) if it would be produced by chance more often than 5 out of 100 times (this is, of course, significance at the 5 per cent level). The Friedman test was used (see Milton Friedman, "A Comparison of Alternative Tests of Significance for the Problem of *m* Rankings," *Annals of Mathematical Statistics*, 1940, pp. 86–92).

one of the central stages of the phase. But in the other cases—where results are presumably not statistically significant—it occurs in a center stage twice and an initial or terminal stage six times.

One further piece of evidence on the shape of subcycles in sales may be borrowed from the chapter that follows. There we find that the monthly pattern of shoe buying is intimately associated with the monthly course of income payments to consumers. Shoe buying and income have virtually all the same subcyclical fluctuations and arrive at turns at nearly the same time. The average timing shows a lead of sales of 0.4 month with an average deviation of plus or minus 1.0 month. Because of the close relation, which can be interpreted only as a causal impact of income on buying, it is pertinent to ask whether subcycles in the rate of change in income payments precede those of shoe sales proper and also at what part of the phase in buying retardation in income payments occurs. The rate of change in income payments is sufficiently smooth so that turns may be located with considerable assurance without recourse to moving averages; I infer that the less easily visible retardations in buying would be likely to occur at the same times. Turns in first differences in consumer income are matched with those in shoe sales proper at fourteen of the sixteen turns in dollar shoe sales that are marked between 1929 (when monthly data on income first became available) and 1940. They lead in ten, synchronize in two, and lag in two cases; the average lead is 3.4 months.[22] Here, too, leads are longer, as indeed they almost must be, for longer than shorter phases, and the question occurs again whether they tend to occur toward the center or at either end of each subcyclical phase. Dividing the phases in sales into thirds as nearly equal as possible, fourteen comparisons may be made. First differences in income fall in the first third of sales in two cases, in the middle third in seven, and in the last third in three, and lag in two cases. For phases of six months or over, of which there were six, the corresponding figures are none in the first third, four in the middle, and two in the last third.

I end with the baffled feeling of someone who tries to examine the bottom of a shallow pool while wind

[22] Turns were matched after an allowance for a systematic lead of one month in first differences in income payments, i.e. first differences in income payments were shifted back one month before determining which turns could be related with those in shoe sales proper. Rules were further relaxed in connection with the long expansion from September 1934 to September 1937 in shoe sales, which was interrupted by a retardation in 1936. This minor subcycle, which was not marked for first differences in income payments with the bonus adjustment, was ignored in matching turns. If it is not ignored, the average lead of first differences in income payments relative to sales is reduced to 2.5 months.

ruffles the water's surface. Contours are suggested and then erased. Investigation seems at least to create a strong probability that, could we transilluminate the random component of the data, retardation would be found to set in *sometime* before subcyclical maxima or minima are reached. Further, there are traces in the data that inflection points occur earlier in longer than in shorter phases, indeed that they occur in the central sections of expansion or contraction; but evidence on this score provides no more than a starting point for further inquiry.

The statistical evidence for retardations that precede turns is supported by logical considerations. Aggregate shoe sales is an arithmetic construct—the sum of diverse experiences of thousands of retailers. At all times some of these retailers are experiencing a rise in sales and some a fall. When aggregate sales are rising, more retailers are experiencing rises (or compensatingly larger rises) than are experiencing falls. A decline in the rate at which aggregate sales rise is occasioned by a decrease in the number of firms experiencing a rise, or a decrease in the size of their rises (relative to the size of the declines), or a decrease in both. An absolute fall in total sales takes place when this situation passes the point where the number and size of falls exceed those of rises. To say that sales retard before they turn is simply another way of saying that the process of reversal takes time. This is not difficult to credit since most economic change is gradual and cumulative. The same argument applies to the onset of revival.

On the other three questions investigated in this chapter—the trend, timing, and amplitude of fluctuation in consumer shoe buying—answers were clear and unequivocal. Because the language of both question and answer is primarily quantitative, I shall not repeat here the findings summarized at the close of each of the three sections.