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CHAPTER 11

LEATHER BUYING OF SHOE MANUFACTURERS: PATTERNS AND PROCEDURES

As fluctuation in the buying of retailers moves toward earlier stages it can be augmented or damped by the operations of shoe manufacturers. Manufacturers' purchasing of leather from tanners can undergo greater or lesser, earlier or later fluctuation than that of their selling—which is, of course, the buying of shoe distributors.

To learn what actually takes place, we turn first to monthly time series on shoe manufacturers' selling, buying, production, and accumulation of stock on hand and on order. Next, we examine the objectives, procedures, and limiting circumstances that lie behind behavior. We try to learn how the problem of procurement is conceived, structured, and incorporated in management techniques, and what facts of the environment also shape the final patterns of leather buying of shoe manufactures.

Fluctuations in Production, Receipts of Leather, and Inventory Investment

We do not have statistics on the selling and buying of shoe manufacturers (orders received and placed), so three major compromises are required. First, lacking information on orders, we rely mainly on statistics of output and receipts of raw material, constantly watching how results are affected by this expedient. Second, lacking information on purchases of shoe manufacturers alone, we use purchases of all manufacturers of leather goods. Since during the interwar period shoe manufacturers used, on the average, about 90 per cent of all cattle-hide leather, this is a minor compromise.[1] Further, with the exception of leather belting (this averaged less than 4 per cent of the total and was of diminishing importance), most of the other uses are in consumer-goods lines (luggage, upholstery, bags, and ornaments); their consumption may have a similar direction, if not the same extent of change, as the consumption of shoes. Third, in order to simplify analysis at the tanning stage, we concentrate on only one of the many sorts of leather purchased by leather-goods manufacturers—leather made from the hides of more or less adult neat cattle, which constituted about 65 per cent of the leather used in shoes.

Assuming, then, that the data may, in effect, be used as part of a continuous vertical series in which shoe distribution is also a member, we study patterns of output and those of input for the most important material of which the final product is composed—cattle-hide leather. Chart 23 shows three important time series all measured in units of equivalent hides; note that "cattle-hide" is omitted from the designation of leather series in all charts and tables and likewise in most of the text. The series in Chart 23 are: leather consumption (the amount of cattle-hide leather converted each month into finished goods); receipts (the amount of cattle-hide leather received each month by leather-goods manufacturers); and inventory investment (the change between the beginning- and end-of-month stocks of "raw" or in-process leather held by leather-goods manufacturers).

A word on the construction of the series before turning to what they seem to say. The domestic consumption of cattle-hide leather is seasonally adjusted shoe production multiplied by a centered eighteen-month moving average of the ratio of the amount of cattle-hide leather used by all leather-goods manufacturers to the number of pairs of shoes produced.[2] Leather receipts are the shipments of leather by tanners to leather-goods manufacturers and dealers. Time in transit is short and relatively uniform for a given area. Consequently, the same figures can be studied either as shipments or as receipts, and we shift the title with the context.[3] Since tanners ship leather to foreign markets and domestic dealers, as well as to leather-goods manufacturers, the coverage of the statistics is not ideal for the purpose of this chapter, but their defects are probably not serious. I estimate that roughly four-fifths of the total went to domestic leather-goods manu-

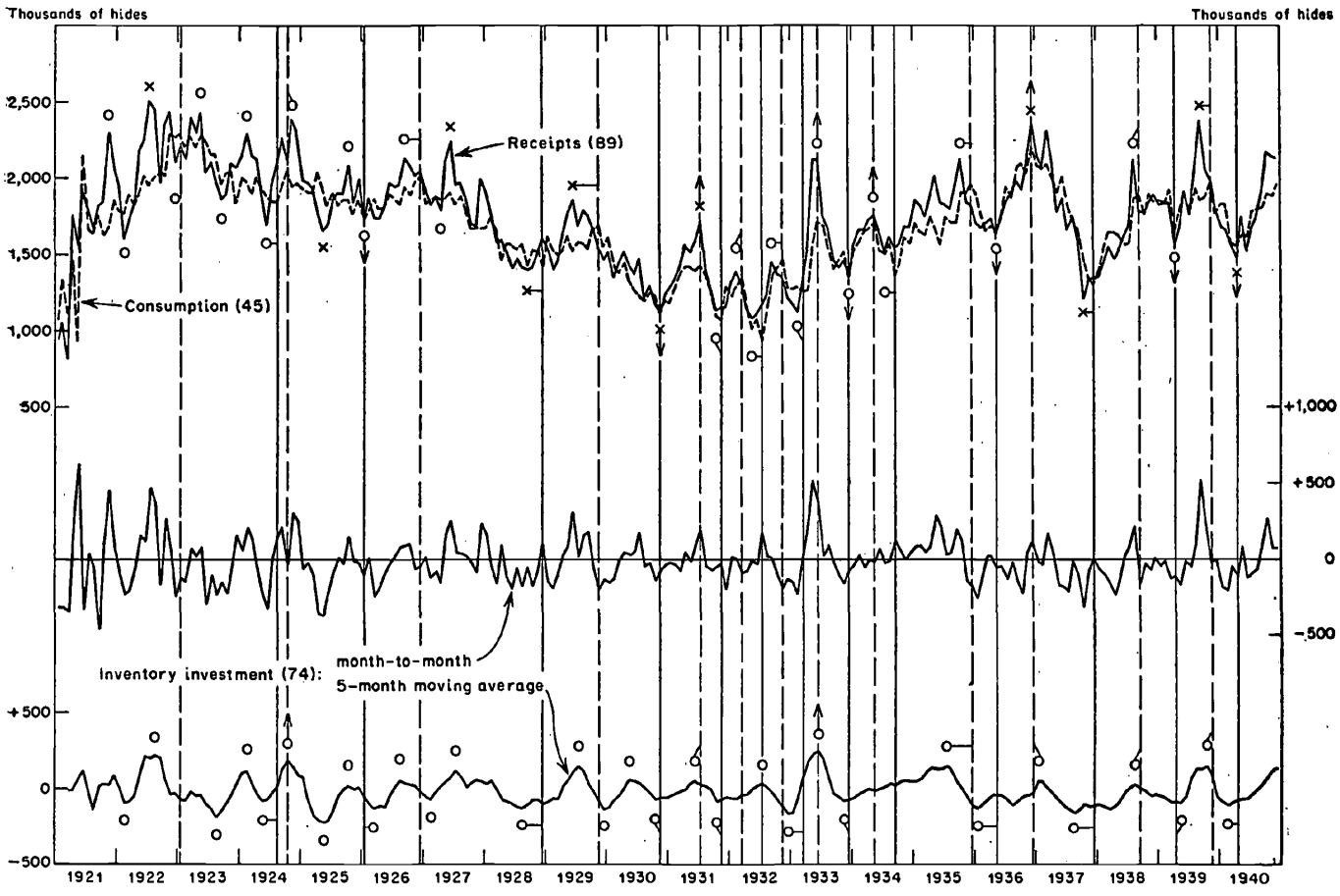
[1] See *Commodities in Industry, the 1940 Commodity Year Book*, prepared and published by Commodity Research Bureau, Inc., for a convenient summary of the several uses of domestic output of cattle-hide leathers.

[2] This series was constructed in preference to the leather-consumption statistics prepared at the Tanners' Council, though with the aid of their material. For detailed description see Appendix B, series 45.

[3] We are greatly indebted to the Tanners' Council for the use of these very important unpublished data.

CHART 23

Leather-Goods Manufacturers' Leather Consumption, Inventory Investment, and Receipts, 1921–1940



Specific-subcycle peaks and troughs (broken and solid vertical lines) in *consumption* (series 45 in Appendix B) are used as reference frame. For the other series, specific-cycle turns are marked by × and specific-subcycle turns by O. Cycle and subcycle turns in inventory investment have not been differentiated. 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 is centered. Parenthetic figures after names of series identify their descriptions in Appendix B. "Leather consumption," "receipts," and "inventory investment" refer here as elsewhere to cattle-hide leather only. Also, measures given in "hides" are leather equivalents of a hide.

facturers and perhaps three-quarters of the total to shoe manufacturers.[4]

Inventory investment is monthly consumption subtracted from receipts after net exports of cattle-hide leather have been allowed for. The figures therefore include inventory investment of dealers in leather as well as of manufacturers of leather goods. Inventories of dealers may have quite a different subcyclical pattern than those of manufacturers, but they represent a very small portion of the total—perhaps around 15 per cent.[5]

[4] The *Census of Business*, Vol. V, tabulates information on *Distribution of Manufacturers' Sales: 1939*. Of the total sales and interplant transfer of leather manufacturers (tanners), exports of leather amount to about 3 per cent, sales to jobbers and wholesalers 15 per cent, and sales to leather-goods manufacturers the other 82 per cent. Assuming that about 90 per cent of the last figure is to shoe manufacturers, they would receive about 74 per cent of the total output of tanners. There appears no special reason why 1939 would be an atypical year.

The series could have been adjusted for exports, since for this we do have monthly statistics. But had this been done, a double set of all standard measures would have been required for receipts of leather-goods manufacturers (excluding exports) and shipments of tanners (including exports), and the small size of exports would have made these operations a mere formality.

[5] There were 829 service and limited-function wholesalers listed in the *Census of Wholesale Trade, 1939* reporting sales of leather and cut stock. Although this group did not report the value (at cost) of their end-of-year inventories, the total "leather and shoe findings" group did; I estimate that the total inventories of those selling leather or cut stock was about $18.2 million. Of course, we do not know how much of this was leather and cut stock.

The *Census of Manufacturers, 1939* likewise gives inventories of materials, supplies, etc., of leather-goods manufacturers, and these sum to $99.4 million. Here, again, we do not know what proportion of the total is leather and cut stock, but on the assumption that the proportions are the same for wholesalers and manufacturers, the former carry 15.5 per cent of the total

In the chart, several facts stand out:

1. Consumption and receipts of cattle-hide leather in leather-goods manufacturing plants follow a closely parallel course through the years. Naturally this could hardly be otherwise over major swings unless huge changes in leather inventories were to occur. But it is true of the minor movements too; all but one of the twenty-six turns marked in consumption between 1922 and 1940 are matched, under our timing rules, with turns in receipts.

2. The correspondence between receipts and consumption seems to include a tendency for receipts to reach peaks and troughs a month or so earlier. Allowing for an average lead of one month, only 22 per cent of the months are in unlike phase.[6] As we shall see in a moment, there is a good reason why receipts of shoe manufacturers lead consumption by this slight interval, whereas those of retailers largely synchronized with sales.

3. The pattern of the raw material (leather) entering a shoe factory appears to have somewhat wider subcyclical fluctuations than the flow off production floors. Since the manufacturer would have more interest in smoothing his own work flow than that of his suppliers, this is not surprising. The extent of the difference is given in our measures of specific-subcycle amplitude. The fluctuation per month expressed as a per cent of the average value of the series is 3.70 for receipts and 2.11 for consumption.

4. Monthly changes in leather-goods manufacturers' stock of leather, raw and in process, also underwent subcyclical fluctuation. This can be seen either in the monthly figures (receipts minus consumption) or in their outlines smoothed by a centered five-month moving average. As might be expected, these fluctuations bear a far closer similarity to those of receipts (twenty-nine turns are matched) than to those of consumption (eighteen turns are matched).

5. Comparison of the turns in this series with turns in consumption as shown in the vertical grid indicates that inventory investment of shoe manufacturers, unlike that of retailers, tends to reach peaks and troughs several months *ahead* of the outward flow of finished goods. Moreover, the lead is likewise apparent, though less emphasized, in the relation between inventory investment and receipts; allowing for a lead in investment of one month, 21 per cent of the months in the two series are in unlike phase. The corresponding figure for inventory investment and leather consumption, after allowing for a lead of two months, is 30 per cent.

6. The presence of conforming subcycles in inventory investment does not mean, as it did in retail stores, that the maximum fluctuations in flow out of the enterprise will be augmented in the flow into the enterprise. Study of the chart specifically at the months of peaks and troughs in consumption shows inventory investment to be often small or even negative at those times. This results in part from the leading pattern of inventory investment. Table 41 provides the measure toward which the eye strives. In the first section, at the foot of column 4, change in inventory investment is seen to be negligible, on the average, between peaks and troughs in the flow of finished shoes off production floors. Consequently, judged in terms of the physical presence of merchandise (not merchandise on order), there is no *amplitude* acceleration of derived demand at the stage where finished shoes are manufactured. The first half of Table 42 shows that this statement applies to long or short subcycles or to all or selected major cycles. For each of the five sorts of classifications the amplitude of inventory investment was negligible compared with the amplitude of consumption. However, there is a *timing* acceleration due to the early turns of inventory investment, and this is of considerable practical and theoretical interest.

But if attention focuses not on the time that physical output of shoes reaches maxima or minima, but on other times—say, when producers hear and perhaps first react to changes in demand—then the figures show that an amplitude effect may well be present. Peaks and troughs in receipts of leather by leather-goods manufacturers are certainly higher or occur at different times, or both, than would be the case were there no fluctuations in their inventory investment. This is evident in the second half of Table 41, where fluctuations in inventory investment are recorded between months when peaks and troughs in receipts rather than in consumption took place. The additional excitation associated with inventory investment is felt in tanneries as shipments are prepared. Measured at peaks and troughs in receipts, inventory investment of shoe manufacturers shows an average amplitude which is about half again as large as that of consumption. In other words, alterations in the flow of finished shoes off factory floors contribute substantially less to the subcyclical agitation, at its maxima and minima, of the flow of materials into shoe factories than do alterations in stocks of raw or in-process leather.

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stock. This happens to be about the same figure as the amount of tanners' sales of leather to wholesalers and dealers taken as a percentage of their total sales. Incidentally, the materials, supplies, etc., carried by leather-goods manufacturers other than footwear manufacturers (and boot and shoe cut-stock manufacturers) amounted also to 15.5 per cent of the total.

[6] The correspondence between consumption and receipts of upper leather is, according to our measures, a little closer than for sole leather—22 and 30 per cent, respectively, are in opposite phase after allowing for a one-month lead. Other facts that we shall encounter also suggest that a difference may be present and why.

TABLE 41

Amplitude of Fluctuation in Leather-Goods Manufacturers' Leather Consumption, Inventory Investment, and Receipts during Each Subcyclical Phase in Their Receipts or Consumption, 1921–1940

(*conforming, or nonconforming* [—], *amplitude in thousands of hides*)

1. REFERENCE FRAME: SUBCYCLES IN LEATHER CONSUMPTION

SUBCYCLES IN CONSUMPTION [a]			PHASE DURATION (*months*)	AMPLITUDE PER PHASE [b]		
Peak	*Trough*	*Peak*	(1)	*Consumption* [c] (2)	*Receipts* [c] (3)	*Inventory Investment* (3) — (2) (4)
Jan. 1923	Aug. 1924		19	320	20	—300
	Aug. 1924	Oct. 1924	2	107	140	33
Oct. 1924	Jan. 1926		15	193	393	200
	Jan. 1926	Dec. 1926	11	120	126	6
Dec. 1926	Dec. 1928		24	433	442	9
	Dec. 1928	Nov. 1929	11	93	6	—87
Nov. 1929	Nov. 1930		12	418	374	—44
	Nov. 1930	July 1931	8	212	379	167
July 1931	Nov. 1931		4	242	420	178
	Nov. 1931	Mar. 1932	4	93	132	39
Mar. 1932	May 1932		2	188	167	—20
	May 1932	Nov. 1932	6	311	200	—111
Nov. 1932	Mar. 1933		4	127	—24	—151
	Mar. 1933	June 1933	3	365	666	301
June 1933	Dec. 1933		6	143	540	397
	Dec. 1933	May 1934	5	144	251	107
May 1934	Sept. 1934		4	177	141	—36
	Sept. 1934	Dec. 1935	15	456	214	—242
Dec. 1935	May 1936		5	244	83	—161
	May 1936	Dec. 1936	7	423	497	74
Dec. 1936	Dec. 1937		12	761	856	95
	Dec. 1937	Sept. 1938	9	479	538	59
Sept. 1938	Apr. 1939		7	53	191	138
	Apr. 1939	Nov. 1939	7	82	249	167
Nov. 1939	Apr. 1940		5	284	346	62
Aggregate for all twenty-five phases			207	6,468	7,348	880
Average amplitude per phase				259	294	35

2. REFERENCE FRAME: SUBCYCLES IN LEATHER RECEIPTS

SUBCYCLES IN RECEIPTS [a]			PHASE DURATION (*months*)	AMPLITUDE PER PHASE [b]		
Peak	*Trough*	*Peak*	(1)	*Receipts* [c] (2)	*Consumption* [c] (3)	*Inventory Investment* (2) — (3) (4)
Nov. 1921	Feb. 1922		3	380	—22	402
	Feb. 1922	July 1922	5	712	212	500
July 1922	Dec. 1922		5	159	—270	429
	Dec. 1922	May 1923	5	9	—33	42
May 1923	Sept. 1923		4	344	204	140
	Sept. 1923	Feb. 1924	5	281	—60	341
Feb. 1924	June 1924		4	346	32	314
	June 1924	Nov. 1924	5	430	79	351
Nov. 1924	May 1925		6	567	75	492
	May 1925	Oct. 1925	5	236	—115	351
Oct. 1925	Jan. 1926		3	77	7	70
	Jan. 1926	Sept. 1926	8	193	60	133
Sept. 1926	Apr. 1927		7	131	17	114
	Apr. 1927	June 1927	2	173	—4	177
June 1927	Sept. 1928		15	691	396	295
	Sept. 1928	June 1929	9	360	88	272
June 1929	Nov. 1930		17	587	368	219
	Nov. 1930	July 1931	8	379	212	167
July 1931	Oct. 1931		3	374	236	138

(continued on next page)

TABLE 41 (continued)
REFERENCE FRAME: SUBCYCLES IN LEATHER RECEIPTS (continued)

SUBCYCLES IN RECEIPTS [a]			PHASE DURATION (*months*)	AMPLITUDE PER PHASE [b]		
Peak	*Trough*	*Peak*	(1)	*Receipts* [c] (2)	*Consumption* [c] (3)	*Inventory Investment* (2) — (3) (4)
	Oct. 1931	Feb. 1932	4	145	114	31
Feb. 1932	May 1932		3	227	216	11
	May 1932	Sept. 1932	4	242	239	3
Sept. 1932	Feb. 1933		5	145	52	93
	Feb. 1933	June 1933	4	792	361	431
June 1933	Dec. 1933		6	540	143	397
	Dec. 1933	May 1934	5	251	144	107
May 1934	July 1934		2	118	108	10
	July 1934	Oct. 1935	15	377	321	56
Oct. 1935	May 1936		7	269	178	91
	May 1936	Dec. 1936	7	497	423	74
Dec. 1936	Oct. 1937		10	817	611	206
	Oct. 1937	Aug. 1938	10	474	267	207
Aug. 1938	Apr. 1939		8	166	−9	175
	Apr. 1939	Sept. 1939	5	464	86	378
Sept. 1939	Apr. 1940		7	561	288	273
Aggregate for all thirty-five phases			221	12,514	5,024	7,490
Average amplitude per phase				358	144	214

[a] Data begin in 1921. The first specific trough or peak marked for receipts was the peak in November 1921; for consumption, it was the peak in January 1923; see also Appendix A, sec. I.

[b] A series is said to conform to the reference phase when it rises between the initial and terminal reference dates of an expansion or falls during a contraction. Standings at reference peaks and troughs are typically taken as centered three-month averages of monthly data (see Appendix A, secs. 12 and 13).

[c] A description of the series will be found in Appendix B: leather consumption (45); leather receipts (89); and leather inventory investment (74). In each section of the table, the data in column 2 are the specific subcyclical amplitude of the series used as reference frame.

TABLE 42

Average Amplitude of Fluctuation in Leather-Goods Manufacturers' Leather Consumption, Inventory Investment, and Receipts during Specified Types of Fluctuations in Their Receipts or Consumption, 1921–1940 [a]

	1. TYPES OF FLUCTUATION IN LEATHER CONSUMPTION 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	5.5	11	25	15	10
2. Average duration, months	31.3	16.1	8.3	11.3	3.8
Net conforming amplitude, thousands of hides: [b]					
Consumption					
3. Average per phase [c]	536	416	259	300	197
4. Average per month	14	22	32	26	52
Receipts					
5. Average per phase [c]	649	449	294	335	232
6. Average per month	17	24	35	29	61
Inventory investment					
7. Average per phase [c]	113	33	35	35	35
8. Average per month	3	2	4	3	9
9. Ratio to consumption [d]	0.21	0.08	0.14	0.12	0.18

(continued on next page)

TABLE 42 (continued)

	2. TYPES OF FLUCTUATION IN LEATHER RECEIPTS 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	5.5	11	35	15	20
2. Average duration, months	37.4	19.4	6.3	9.3	4.0
Net conforming amplitude, thousands of hides:					
Receipts [b]					
3. Average per phase [c]	745	120	358	441	295
4. Average per month	21	37	57	47	73
Consumption					
5. Average per phase [c]	389	331	144	229	79
6. Average per month	11	17	23	25	20
Inventory investment					
7. Average per phase [c]	356	389	214	211	216
8. Average per month	10	20	34	23	53
9. Ratio to consumption [d]	0.92	1.18	1.49	0.92	2.72

[a] All series are identical to those in Table 41.
[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] Net aggregate conforming amplitude for inventory investment divided by the same measure for consumption.

This finding is similar to, though somewhat more extreme than, the parallel one for shoe retailing, Measured at turns in the earlier of the two flows that bound the activity of each sort of firm, a large part of the fluctuation in the flow of materials into the plant takes the form of fluctuation in inventory investment rather than in outflow of finished goods. But for shoe retailers, this same statement could be made when fluctuations were measured at the time that the later of the bounding activities, in this case retail sales, reached peaks or troughs; for shoe manufacturing, because of the lead of inventory investment, this was not the case.[7]

For shoe manufacturing, the contributions of consumption and of change in stocks to fluctuation in receipts of leather characteristically differ according to length of phase. It will be recalled that analogous distinctions were observed for retail trade. The second half of Table 42 indicates that inventory investment plays a less important part in cycles than in subcycles in receipts of leather, less in all cycles than in only those associated with the major tides in the industry. But these differences may simply reflect characteristic differences in phase duration, where a sharp line of cleavage seems to lie: for phases of under six months' duration, the relative importance of inventory investment is almost three times as great as for phases of over six months.

These findings excite curiosity. Clearly, inventory investment by shoe manufacturers plays an important part in shaping the minor fluctuations in tanners' shipments of leather. What sorts of objectives and cir-

[7] The close association of fluctuations in inventory investment with leather receipts raises this question: Assume that leather receipts were a very poor series, having many erratic and economically meaningless fluctuations; assume that these same fluctuations do not appear in the more reliable series on consumption; they would then reappear in inventory investment obtained by subtracting consumption from receipts.

To reduce the likelihood that this sort of thing lies behind the conclusions as to the importance of inventory investment, the relative contributions of consumption and inventory investment to fluctuations in receipts were measured using the SLH-subcycle reference frame. But the reference dates were shifted uniformly to allow for the average timing characteristics of receipts. A lead of either two months or one month was about equally characteristic, so both were used. With the lead of two months, the aggregate amplitude of receipts, 1922–1940, was 8.9 million hides, 4.0 million for inventory investment and 4.9 million for consumption; thus investment amounted to 82 per cent of the fluctuation in consumption. When the comparisons were made adjusting the reference date to only one month earlier, the three figures were, in millions, 9.5, 3.7, and 5.8, respectively, and investment now amounted to 64 per cent of the fluctuation in consumption during reference subcycles. These calculations suggest that, though some of the importance of inventory investment in accounting for fluctuation in leather buying relative to shoe selling may be a function of the way in which random elements affect the calculation, the basic conclusion as to its importance holds.

cumstances cause the receipts of leather by shoe manufacturers to have the temporal association with finished production that produces this amplifying effect?

To answer this question it is necessary to examine, as we did for shoe retailers, the way in which the size of stocks is related to, and conditioned by, the selling, production, and procurement problems of the business. In the course of this examination, light may be thrown on one aspect of a broader question. It would be quite possible for the observed patterns of inventory investment in raw and in in-process leather to exist even though shoe manufacturers always covered their leather requirements the moment they received orders for shoes. The greater fluctuation in leather receipts than in shoe production could then simply reflect a closer association between leather orders and receipts than between shoe orders and shoe production. On the other hand, the patterns would likewise be entirely compatible with orders for leather that had greater subcyclical amplitude than orders received for shoes. In other words, the pattern of stock on order may further amplify fluctuation in the backward transmission of demand imposed by the pattern of stock on hand. It will be worthwhile to keep this question in mind—though, to anticipate, there is little that we can do to answer it—while studying how and why inventory investment follows the course that it does.

How the Volume of Production and Buying Is Determined

First, to what extent are production schedules and buying linked to expected sales? In a retail shoe store we could almost take for granted that merchants aimed to buy precisely those shoes, and in just the quantity, that customers would purchase promptly at a profitable price; inventory aims were colored by this main purpose. In a manufacturing concern we cannot take this firm intended association between selling and buying for granted, but must inquire specifically whether it is present. For without the central intention of buying what will in short order be sold, it is an anomaly to speak of a sharp and central "aim" with respect to the physical size of inventories at all. As the broad outlines of buying procedures are described, it is well to keep in mind other questions, the answers to which contribute to the specification of the acceleration mechanisms that may be at work. Insofar as buying is based on sales, are expected or actual sales critical? Is there a cascaded pattern to buying for output of a given month? Is the price of the finished product known when purchases of raw materials are made?

PRODUCTION SCHEDULING

Periodic planning of the amount, style, color, and price of shoes to be produced during the ensuing months (very typically six months) is common among shoe manufacturers. The sales forecasts on the basis of which plans are laid are prepared with great care. Ordinarily, plans for the fall line are formulated around April or May, and for the spring line around October. In planning a line, a great deal is taken for granted and typically not subjected to review each season—the general sort of shoe to be manufactured, the type of customer to whom it is meant to appeal, the price line at which it will be expected to retail, the marketing channels to be used, the process of manufacture, the capacity of the factory, and even detailed cost figures for many of the pieces or operations involved in the manufacture of the various classes of products. Moreover, many individual models, at least for manufacturers of staple shoes, will be carried over from the previous year. But more typically, styles will change from season to season, though change itself may follow a discernible trend. For women's high-style shoes, many new models will be introduced not only at the planning period, but frequently during the season.

The sales forecasts will be made for each line of shoes—that is, for each group of models falling into some broader category such as a given retail price line, technique of manufacture, or use designation. For a large company, the forecasts may be built by reconciling the summed estimates of individual salesmen and district managers with estimates made by the heads of the company or various branches of the company. In a small company, the guess as to future sales may be done scientifically or by ear. Generally, the core of the estimating process is the record of last year's sales or of sales for the past several years. This figure is then modified by adding the amount that the business may be "going ahead," and by judgments on the condition of retailers' stocks and on general business conditions in the coming season. The prognosis of the business climate will affect not only the estimate of total sales but also its composition. If, for example, the forecast of economic weather is gloomy, lower price lines may be emphasized; or shoes made for stock may gain in importance relative to those made to order.

The sales forecasts are often used as the basis for financing plans, marketing plans, personnel plans, or for the integration of various branches of the business. They may also become the basis of leather buying. But as far as I can determine, they do not typically provide the basis for day-to-day production schedules.

The reason for this is clear enough: the specificity of the product is too great to permit extensive manufacture of anything except the particular style, color, material, size, and width of shoe that someone has ordered. Shoe manufacturers testify to this, claiming that most shoes in this country are made to order. Of course some anticipation of peak requirements takes place; also, an in-stock department is carried by many manufacturers. But even in in-stock departments, though a particular shoe is not manufactured in response to a particular order, information conveyed by the incoming order on what shoes are being bought and in what quantities is closely audited before shoes are ticketed for production.

The notion of a tight link between sales and production seems to be supported by scraps of statistical data. Such information as we have on the volume of orders, largely wholesale sales, seems to bear a close correspondence with the volume of shoe output month by month (see Table 32, above); and the fact that wholesale sales lead, especially at peaks, suggests that output responds to orders rather than vice versa.

Stocks of finished shoes carried by shoe manufacturers appear to be small relative to production. This perhaps suggests that the reservoir from which to supply a rate of shipments that diverged materially from that of production is small, and consequently serious divergence is debarred. Judging from reported end-of-year inventories, shoe producers had enough shoes in stock to cover about three weeks' sales in 1937, two weeks' sales in 1939, and one week's sales in 1947.[8] Though these figures are low for the year as a whole, they indicate that stocks are too small to facilitate any considerable divergence between production and shipments.[9] To illustrate, on the basis of the census figures: If production had been only 10 per cent less than shipments for three months in a row in 1939, stocks would have been reduced to about two-fifths of their average value.

Seasonal patterns, too, should be capable of informing on the association of orders and production, but unfortunately neither of the stand-ins for subcyclical or cyclical timing patterns of shoe orders (wholesale sales and shoe and leather orders) would speak reliably about seasonal patterns. However, the association of seasonal patterns of retail sales with those of shoe production is not entirely without relevance. The months of peak or trough activity in production tend to precede those in sales by two months.[10] Were the seasonal patterns of production simply a product of the effort of shoe manufacturers to operate efficiently in spite of the strongly seasonal character of consumer takings, there would be no reason for production to fall off until a few weeks before seasonal peaks in sales. That it does suggests that production schedules respond to actual orders from retailers or wholesalers, which are heaviest several months before retail sales reach peaks.

The conclusion emerges that production in shoe factories is undertaken primarily in direct or indirect response to specific orders, though, of course, there is a penumbra of seasonal anticipation of demand, or of work undertaken on the basis of advices less binding to the customer than a confirmed order (not that the bond of a confirmed order is always inviolate).

BUYING PROCEDURES

How buying by shoe manufacturers will relate to orders for shoes must depend also on objectives about in-process or raw materials stocks. In order to determine what they are, or indeed in what sense the term objective applies, it is necessary to learn how leather buying is governed. The problem of procuring leather for manufacture into shoes has a double focus: first, leather should be on hand at the time when shoes ought to be cut because of the limitations set by promised delivery schedules and efficient production planning; second, it should be bought at the right price.

Shoe manufacturers purchase leather in a market in which suppliers (primarily tanners) carry large stocks of finished leather; in the interwar period they averaged almost a three months' supply. Small lots of leather can often be obtained within a day or so, plus time in transit. When markets are weak, very sub-

[8] The ratio of the value of output for the year to an average of the value of beginning- and end-of-year inventories of finished goods held by shoe manufacturers was reported to the *Census of Manufactures* (1937, Part II, Table 2, p. 123; 1939, Vol. I, Chap. VIII, Table [1], p. 357; 1947, Vol. I, Chap. V, Table [1], p. 154 and Vol. II, Table 5, p. 480) as 15.5 in 1937, 25.4 in 1939, and 48.2 in 1947.

[9] Year-end inventories are typically lower than those for the year as a whole. Also there is serious question as to how good the census information on inventories for shoe factories is. Particularly when manufacturers produce largely to order, it seems likely that they may answer that they carry no inventories of finished goods even though they hold some inventories, most of which, incidentally, may be sold.

[10] Seasonal indexes for retail sales (an average of those of chain and department store shoe sales) and for shoe production for 1926 to 1940 are:

	Jan.	*Feb.*	*Mar.*	*Apr.*	*May*	*June*
Retail sales	68	64	97	113	114	122
Shoe production	92	99	112	104	97	94
	July	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*
Retail sales	78	75	113	104	100	151
Shoe production	98	118	112	110	85	80

The rank correlation of seasonal indexes of production, allowing for the two-month lead of production compared with sales, is +.78. With a one-month lead, it is +.29, and synchronous timing yields a rank correlation of −.30.

stantial lots may be obtained in the same way. Tanners require advance warning for large lots in a strong market, especially for upper leather, which is made in a wide variety of qualities, colors, and finishes. But the need of the large leather buyer to reserve tanning facilities can be covered by a blanket order that does not require inconveniently long advance knowledge of just what shoes will be bought and, consequently, what leathers will be required. The speed with which leather can be obtained is testified to by the fact that a thirty-day supply seems commonly to be considered adequate for the efficient mechanical operation of a shoe factory. This means that a substantial proportion of leather can actually be on hand in time to meet production schedules if it is purchased somewhere between two to six weeks ahead of the day when work on shoe orders is scheduled to start. For the industry as a whole, leather stocks have equaled as little as one and a quarter months of leather consumption when output was high.

But if, as has been indicated, shoe distributors typically place a substantial portion of their orders several months before the shoes are required to be delivered, a large proportion of leather can be ordered after shoes have actually been sold. Consequently, the shoe manufacturer, unlike the retailer, does not have to buy mainly on the basis of guesses about future sales. Were it not for the matter of price expectations, he could buy at least a very large proportion of his requirements on the basis of actual, as contrasted with expected, sales.[11] This possibility appeared in the lead of wholesale sales relative to shoe production turn by turn (see Table 32, above). If we assume that turns in orders are dated by turns in wholesale sales, then at peaks in production, when it may be necessary to buy leather four to six weeks before it has to enter production, turns in orders occur earlier than those of shoe production in 85 per cent of the turns. At troughs, when leather can often be obtained well within the month, troughs in orders occur earlier than, or in the same month as, troughs in production in 85 per cent of the turns (they are synchronous in 46 and lead in 39 per cent of the cases). Allowing for a lead of two months at peaks and none at troughs, wholesale sales are in opposite phase to shoe production in only 23 per cent of the months. Thus at both peaks and troughs, the figures suggest that leather can usually be bought after the orders for shoes have been written yet be on hand, if not when the production run first had to get under way, at least so shortly thereafter that raw material stocks can easily bridge the gap.

Insofar as a shoe manufacturer links his buying to his customers' buying—buying earlier when retailers have bought earlier and at the last minute when they have—leather buying will have the same cascaded patterns as shoe buying: orders of varying term will converge on delivery requirements of a given month. However, this pattern will be modified by the desire to smooth seasonal fluctuations in production by taking advantage of early orders to produce before the seasonal peaks.

The fact that leather *can* be bought after sales are known is important in connection with the problems in which we are interested, but equally important is the fact that, for several sorts of leather, there is little reason why it *should* be. Sole leather and standard sorts of brown, black, and white upper leather are staples that can always be used and for which carrying charges are not high, so that if there are good reasons not to gear the buying of these leathers tightly to current sales, the associated inventory costs are not a serious deterrent. Even for upper leather, the possibility of placing a blanket order without specifying types and finishes means that ownership position can vary considerably from current requirements for production schedules. Economies or other advantages are often thought to result from anticipating requirements, and anticipation at some times implies retrenchment at others.

Extension of the ownership position in leather can take several forms:[12] (1) Spot purchases may be increased when markets are expected to tighten; conversely, when they are expected to fall, buying may be held up as long as stocks permit. (2) More long-term orders may be placed. Typically, the advance leather purchases will be slated for delivery at several stated times during the season. Each of the lots may be bought at the same or at different prices; in either case, however, the price would usually have been decided at the time the order was placed. (3) Contracts for the purchase of leather may be placed without specifying the exact product to be delivered. Whether the futures market in hides is also used as a method of hedging against or taking a bet on leather prices,

[11] There is, of course, a guess involved as to whether orders will be firm, especially at certain times, but at worst only a portion of total sales is likely to be involved.

[12] I use the term "ownership position" to apply to unprocessed and semiprocessed leather but not to finished shoes. It ought perhaps mean all materials—whether raw, in process, or finished—that are either on hand or on order, minus outstanding orders of customers. As far as I can judge, the term ownership position seems to be used in the more limited sense in the shoe industry (though not in the tanning industry)—it applies here to leather, not finished shoes, and allowances are not made for customers' orders outstanding; in any event, that is how I use it unless otherwise stated.

I cannot say; reports conflict. My impression is that the part it plays is probably small.[13]

This description of how leather is bought carries implications concerning the character of the two accelerating mechanisms—the one linked to stock objectives and the other to changing market prospects. Both need to be examined in the environment of shoe factories.

Stocks under Stable Market Prospects

Were market prospects stable, interest would focus on the amount of leather that ought to be in the factory; the amount on order would be a simple function of this amount, changing perhaps proportionately, and may be disregarded in considering causes of change. Our point of departure is the fact that a large portion of needed leather can be bought after orders for shoes have actually been received. Two interesting results follow.

First, were this true of all leather and in all cases, inventories of unprocessed leather on hand and even on order could be very small indeed. They would have to consist only of a supply to bridge the period required to buy, receive, and sort leather, plus a safety margin. Insofar as there is always some portion of shoe output for which orders are not on hand in time to buy leather explicitly for those shoes, a further margin is required. Under stable market prospects, then, stocks of leather will bear a positive relationship to the volume of production. The character of the relation will depend on storage costs, on the convenience of a particular frequency and size of leather orders, on the requirements of sorting and marking leather, and on a safety factor that may be large or small depending on the extent of the unknown element in sales and in deliveries. Secondly, whether or not the resulting intended size of leather stocks is properly thought of as an objective or simply as the consequence of objectives focusing elsewhere, it is not one that must be enforced primarily through the progressive correction of unavoidable error, since a substantial portion of leather buying can be based on actual rather than anticipated sales. When sales are known, inventory objectives can be roughly validated directly rather than through correction of error. There need be no error.

Presumably, then, under stable market prospects, the size of stocks of unprocessed leather would be directly associated with the volume of production, but the relation would be a loose one. Since extra receipts must precede extra production, leather inventories would probably reach peaks and troughs a bit before shoe production. It is possible, though not at all clear, that the association between stocks on hand and on order and orders for shoes would be closer than between these stocks and shoe production. For stock in process one would expect a positive, though not a rigid, association between output and stocks: a three weeks' supply may be a fairly typical figure.[14] With so short a period of production, one would hardly expect the theoretically indicated lead of change in in-process stock over change in finished output to be visible in monthly statistics. For raw and in-process leather together, the aggregate to which the major time series refer, we would expect (under stable market conditions) stocks to be small—perhaps averaging no more than six weeks' supply; this is about the minimum ratio shown in the figures prior to 1938, when the data seem to undergo some curious aberration. A change in shoe sales or production would be expected to involve a synchronous or a prior change in manufacturers' stocks on hand and on order, though not a large one—perhaps one of about equal size; the incremental output-stock ratio (relating preparations for beginning-of-month stocks to changes in output between the previous month and the current month) might be around one.

Unsold finished stocks of shoes appear to be small and in all probability to respond inversely to at least the short-lived fluctuations in consumer demand. This is suggested by the character of the problem manufacturers face, evidence for finished stocks of other sorts, and a little information on shoe stocks of shoe manufacturers. Beginning in 1946, information on stocks, output, and shipment for a sample of shoe manufacturers is available.[15] Production dropped strongly between the second quarters of 1946 and 1947—from 48.3 to 36.9 million pairs per month; contemporaneously, stocks rose from 6.7 to 12.0 million pairs, or from a seventh to a third of monthly output. Production rose very gradually for the next four years to 40.5 in 1950, the spring when the Korean war began. Stocks stayed about level until the scare of shortages sent them soaring to 15.9 million pairs, or two-fifths of a month's output. In the next year the inverse pattern reappeared as production fell to 38.1 million pairs per month in the second quarter of 1951 and stocks rose to 19.3, or one-half a month's output. In any event, stocks of finished shoes in manufacturers' plants are very small and un-

[13] The Hide Exchange was founded in 1929 and trading in it did not reach sizable proportions until about 1935. At most, it could have played a part only in the last five years that our figures cover.

[14] A two-week period in actual production is common, and waits between departments are likely to occur.

[15] Monthly statistics are given for shipments and production for identical firms in the *Facts for Industry* series on the production of shoes and slippers of the Bureau of the Census, so that change in finished shoe stocks may be computed. The data are linked to the census figure for stocks in 1947.

sold stocks probably smaller still, and we do not refer to them again.

Changing Market Prospects

In the constellation of reasons that stimulate or discourage shoe manufacturers' forward buying, expected price plays a more important part than it does for the retailer. Consequently, a model for the impact of price expectations may be made more precise than is possible in connection with the more nebulous associated considerations such as protection of delivery dates and qualities, so important in retailers' buying. Further, since the havoc that unintended change in stocks under stable market prospects plays with an empirical study of stocks is at a minimum for leather inventories, and since our data on stocks are at least better than our data on shoes, a well-founded hypothesis may be subjected to a tentative empirical test.

MOTIVES INFLUENCING SHIFTS IN MARKET POSITION

A variety of motives, individually or together, may counsel either an extension or a contraction of the shoe manufacturers' position in leather.

Shoe manufacturers do not take the risk in buying staple leathers that a shoe distributor does in buying the highly specified product, shoes. Both physically and stylewise, sole leather and various standard sorts of brown, black, and white upper leather are durable products. They are sufficiently undifferentiated so that they can be used in the manufacture of a wide variety of specific shoes. Further, leather is not exceptionally bulky or expensive to store. In consequence, buying predicated on a guess about the future course of prices hazards only the difference between the price paid and what might have been paid had prices been correctly forecast (assuming no correlated changes had occurred). It is not accompanied, as in a retail shoe store, by the serious danger that error in estimating the amount of customers' requirements in the near future will involve costly markdowns, physical loss, or high carrying charges. The absence of reasons not to consider market prospects in leather buying opens the door to positive motives.

Positive reasons for altering ownership positions are similar to those encountered in retailing, though their relative importance differs. When business is brisk, stocks of finished leather at tanneries diminish; also, as production nears capacity, hides required to fill new orders for leather are likely to suffer delay in reaching the soaking vats as well as the finishing sheds. In either case, the ability of customers to obtain desired grades of leather at short notice must diminish compared with times when demand is slack, finished stocks high, and output low. Consequently, the fear of impaired selections or late deliveries is likely to cause a shoe manufacturer, like a shoe retailer, to order a larger proportion of expected requirements further ahead when markets are expected to be tight than when they are expected to be slack. The somewhat better bargaining position of the seller relative to the buyer at such times may tend in the same direction since sellers prefer advance notice. Finally, the successful operation of a shoe factory requires that leather be bought at the right price; the effort to do so induces early buying in an advancing market where selling prices are relatively inflexible and operating margins are threatened by soaring buying prices.

Action to achieve simultaneously sure delivery, desired quality, and right price often takes the form of a contract with a tanner to deliver an order in several lots over a sequence of months. The price at which such a contract is written may reflect economies for the tanner. These economies may increase in a good market as advance contracts for leather permit early buying of hides (without attendant risk) since their price is likely to rise more than leather price. If so, it is possible that some of the advantages, if passed on to the leather buyer, induce additional advance ordering. But whether or not this is the case, there are many other reasons why the buyer will choose to increase his advance-order ratio when markets tighten—the fear of poorer selections and delayed delivery; the conviction that though he is paying more for sequential deliveries than the spot price at the time of making the contract, he is paying less than he would have to pay if he waited until nearer the required delivery date. When extension of ownership position is achieved through purchases for immediate delivery, all three motives (better selection, secure delivery, and advantageous price) are again likely to exert pressure in the same direction and at the same time.

In short, whatever form shifts in market position may take—whether that of advance contract or of spot buying—motivation will include each of the price, delivery, choice aspects. This is likely to be true for an individual, but it is certainly true for the market as a whole, composed of many different individuals some of whom like to think in terms of price and others only in terms of operating efficiency. However, it seems inevitable that, of the three motives, expected price, either directly or via its effect on margins, must be far more important in leather than in shoe buying.

But just as the immediate motive can be any or all of the three sorts of considerations, the next level of judgments is likewise interwoven and interchangeable. Judgments about price, delivery periods, and selections rest jointly and individually on judgments about

the strength of demand, prices of materials, and perhaps operating margins. Thus, the expectation that delivery periods are likely to lengthen or choices become poorer is certainly inspired by a high, and rapidly increasing, level of customer demand. An increase in customer demand may mean an increase in undelivered orders, a bullish sign. But since shoe manufacturers know that part of the pressure on the resources of their suppliers is due to speculative buying, price expectations must also dictate the anticipated physical delays. Conversely, unless customer demand is expected to be strong, prices are not likely to rise. The role that margins play is more subtle but also interwoven with the other two.

At a deeper level still, judgments about prices (or margins), deliveries, selections, and customer demand also depend on a broad fabric of information and experiences that come to the businessman from every corner of his domain during every hour of the day—the level and composition of his sales, orders, stocks, and costs; the way salesmen talk and act; how many telephone calls he receives from would-be sellers (or buyers if he is a seller); how rapidly proposed prices are accepted by the other party to a trade; what sort of delivery terms are being considered; gossip about large receipts or purchases or sales made in some quarters. Individual experience can be multiplied by discussion with others—competitors, resources, customers, bankers, or advisors of various sorts. Many of the large integrated companies get a great deal of information from other branches of their own business, at the same time that other people in the trade keep spyglasses trained on their doings. Finally, statistics for the industry are watched; general economic phenomena may be considered—other open-market prices, broad economic conditions, the temper of the labor market, to mention a few. It is useful to bear in mind how intricate is the perceptive apparatus that governs expectations. It indicates that in part, expectations support themselves both by influencing the expectations of others and, when they result in appropriate actions, by forming a basis for further expectation of the same sort. But for the moment we can deal with these matters at a more superficial level as we endeavor to describe the pattern through time of the major factors bearing on changes in ownership position caused by changing market prospects.

For this purpose, expected price, deliveries, and selections can be treated as one since they move together —we call them price. But it is necessary to distinguish between the actual level of expected price and the risk and uncertainty dimensions of the guess. Expected sales likewise need to be separately considered as does also that aspect of price expectations that focuses on operating margins.

EXPECTED SALES

In an industry where supply is not subject to strong independent alteration, the level of actual prices and of expected prices are likely to be associated with the level of demand and perhaps its rate of change. Consequently expectations about sales will bear on inventory investment through their influence on expectations about prices. In addition, when sales are high and increasing rapidly, stringencies are more likely to develop in the supply of leather than when they are low and falling rapidly. Consequently lengthening delivery periods and reduced selections have a positive association with optimistic evaluations of customer demand. Of course, these evaluations are not single-valued but are probability distributions for which both the character of the distribution and the level of uncertainty are relevant to their effect on buying.

The effect on buying of a given distribution of expectations held with a given certainty will also depend on the seasonal pattern of sales. Compare two industries: for one the seasonal index of buying for January through June is 100 for each month; for the other the index for each month in sequence is 70, 70, 130, 140, 100, 90. In both cases sales are expected to rise by 10 per cent. In the first industry, a factory will be busier by 10 points each month. In the second, it will be busier by 10 per cent of 140 or 14 points in the busiest and 7 points in the least busy months. If the supplier is not willing to anticipate requirements in slack months, there will be more trouble getting goods in April in the second case than the first. For if sales are expected to increase for the season, each month's sales will typically be expected to rise by about the same *percentage* amount. But the difficulty in getting supplies is a function of the *absolute* increase or decrease in work on factory floors. Consequently, the absolute maximum monthly impact of the resulting stringency will be larger, other things the same, for the industry with strong seasonal peaks, like shoe production, than for an industry where output is subject to less seasonal variation.

If, as these reflections indicate, the level of sales and perhaps its rate of change influence expected prices and delivery conditions both directly and through an impact on actual prices and actual delivery conditions, it is not likely that prices will be expected to rise unless sales are rising, or to fall unless sales are falling. Appropriate behavior of sales thus becomes a necessary though not a sufficient condition to changes in market-prospect-tied buying. The link is important, for it

means that the two accelerating mechanisms often reinforce and seldom oppose one another.

IMPACT OF EXPECTED PRICES ON LEATHER BUYING

The Expected Change in Prices. Consider how the leather buying of shoe manufacturers might behave if businessmen knew both future production schedules and prices, and were entirely sure and willing to act; that is, assume risk and uncertainty [16] to be nonexistent. For convenience, assume further that there is no cost to carrying leather stocks. (Indeed, since we address ourselves to orders for, rather than receipts of, leather, there need be no explicit cost to the buyer.) Assume, finally, an arbitrary limit of six months to the period for which leather will be bought ahead. These are precisely the assumptions that underlay the corresponding calculations for shoe buying of retailers and wholesalers (Tables 36 and 37 in Chapter 9).[17]

The results appear in Table 43. Apparently shoe manufacturers might have increased their margins by, on the average, about 11 percentage points and as much as 22 points in one case. The corresponding figures for possible advance shoe purchases of shoe retailers and wholesalers were about 4 and 6 percentage points respectively for the average figures, and 9.5 and 13.5 for the extreme ones. In addition, the number of opportunities for speculative gain were more frequent for shoe manufacturers than for shoe distributors. Needless to say, the table glimpses no more than a foolish dream of the reward to be won by successful speculation, since any number of the assumptions underlying its construction are thoroughly unrealistic. However, the dream appears to be a bright one and, in consequence, likely to be pursued. It suggests that since the potential reward is high, the effort to buy leather at the right price is extremely likely to be an important part of management objectives in a shoe factory.

It illustrates a second point easily obscured. The gross advantage to be gained from advance buying depends not on the level of leather prices, but on their *rate of change.* Ignoring risk and uncertainty, the expected advantage depends, *ceteris paribus,* on the expected rate of change in prices. Then the amount actually bought ahead would depend, of course, on carrying charges and the costs of buying and receiving orders of various sizes, factors ruled out of the example.

TABLE 43

Opportunities to Increase Shoe Manufacturers' Margins by Correctly Anticipating Rise in Wholesale Price of Leather by as Long as Six Months, 1922–1941

(*prices in cents per pair of shoes*)

CURRENT MONTH WHEN SALE IS TO BE MADE		WHEN BEST ADVANCE PURCHASE MIGHT HAVE BEEN MADE		SELLING PRICE AS REPORTED FOR CATTLE-HIDE LEATHER SHOES	MARGIN FOR CATTLE-HIDE LEATHER SHOES	GROSS MARGIN ON SHOES PURCHASED IN ADVANCE		
Date (1)	*Leather Price* [a] (2)	*Date* (3)	*Leather Price* [a] (4)	ON DATE OF SALE [b] (5)	% OF SELLING PRICE [(5) − (2)] ÷ (5) × 100 (6)	*Cents per Pair* (5) − (4) (7)	*% of Selling Price* (7) ÷ (5) × 100 (8)	*Excess over Margin* (8) − (6) (9)
Oct. 1922	108.6	May 1922	91.2	178.9	39.3	87.7	49.0	9.7
Jan. 1925	112.5	July 1924	92.3	180.6	37.7	88.3	48.9	11.2
Oct. 1927	131.0	Apr. 1927	92.6	194.9	32.8	102.3	52.5	19.7
Oct. 1929	110.7	June 1929	101.5	182.5	39.3	81.0	44.4	5.1
Aug. 1931	83.0	Feb. 1931	75.6	154.9	46.4	79.3	51.2	4.8
Oct. 1932	62.5	June 1932	56.1	130.7	52.2	74.6	57.1	4.9
Aug. 1933	85.1	Feb. 1933	52.0	152.6	44.2	100.6	65.9	21.7
May 1935	72.6	Nov. 1934	59.8	153.0	52.5	93.2	60.9	8.4
Feb. 1937	87.5	Aug. 1936	65.6	164.4	46.8	98.8	60.1	13.3
Nov. 1938	79.9	Aug. 1938	67.3	161.2	50.4	93.9	58.3	7.9
Oct. 1939	92.7	May 1939	67.8	176.8	47.6	109.0	61.7	14.1
Jan. 1941	92.3	Aug. 1940	74.2	175.8	47.5	101.6	57.8	10.3
Average								10.9

[a] Current (LIFO) leather cost per cattle-hide shoe (series 20 in Appendix B).

[b] The average price of shoes that appear to be made of cattle-hide leathers as reported to the Bureau of Labor Statistics (series 4).

[16] I make the usual distinction between the two: risk involves chances of an actuarial sort; uncertainty involves exposure to surprise.

[17] There is less justification in connection with leather buying for the assumption that risk, uncertainty, and carrying cost are zero prior to six months and intolerable thereafter. But there is some reality to the notion of absolute limits; and the contrast between the possibility of gain to the leather buyer and the possibility to the shoe buyer, under identical assumptions, is instructive.

Consider now how the picture is altered by the inclusion, in as realistic a fashion as possible, of first risk and then uncertainty.[18]

Risk. It is clear that a shoe manufacturer believes that risk attaches to increasing his advance position, and that the extent of the risk is a function not only of his evaluation of market conditions, but also of factors involving his own firm. For one thing, there is more risk in buying six months ahead than in buying two months ahead—in carrying a six-month supply on hand and on order than in carrying a two-month supply. To justify the larger investment, prices will have to be higher than the current ones for six rather than two months; the speculation will endanger a larger proportion of the resources of the company, especially the liquid resources; the speculation will require that a larger supply of funds be available, and if the funds must be obtained from a bank, a large loan may be more difficult to liquidate than a small one, whereas failure to liquidate at the proper time is a black mark on a credit rating.[19] Risk also differs sharply for various sorts of leather. It is less for staples (sole leather and brown, black, and white upper leather) than for side upper leathers of a less standard sort. The average week's supply of leather stock as a whole will thus be a weighted composite of very different supplies of each of the sorts of leather on hand.

Increasing risk attached to extending the forward position or substituting risky for less risky leathers means that inducements must increase to warrant further market extension. Carrying, ordering, and delivery costs are no longer the limiting factor, given the rate of change in prices. As the output-stock ratio (or perhaps the absolute amount of stock) increases, a higher rate of return—that is, a greater rate of increase in prices—is required to justify further extension of a given amount.

But it seems likely that the influence of risk on the association between the size of the advance position and the expected rate of change in prices is essentially discontinuous. We have already learned that shoe retailers do not seem to extend their position past the season's requirements except under most unusual conditions. Shoe manufacturers may restrict their commitments for all but the most staple sorts of upper leather in somewhat the same manner. In any event, the advantage probably must increase a great deal more than proportionally to justify a position greater than a specific number of months' supply even in staples. The appropriate number of weeks' supply may be subject to alteration under extreme conditions of one sort or another, but, by and large, there are generally accepted limits to permissible market extension within an industry. Thus risk not only increases with the length of the advance position; it tends to reach a point where it virtually prohibits further extension.

This asymptotic character of what we shall call the *long-short market range* has important consequences, for it tends to set limits to swings in buying associated with changing market prospects. But in spite of their considerable theoretical and practical importance, little is known about the character of the limits. I set down a few impressions which are badly in need of testing and elaboration. On the short side, the limits are set by factors of the sort discussed earlier under stable market buying. On the long side, seasonal patterns both in customers' buying and in the supply of raw materials play a part, and the physical durability of the material may also have some bearing on the point. However, any or all of these factors are reflected in trade customs, and it is these mores that seem to be the immediate determinants of the upper limits. They seem to be enforced not only by a manufacturer's own judgments on sound policy, but also by his suppliers' and bankers' judgments. The limits may shift with the years—my impression is that there has been a reduction since the early twenties in the width of the range. They differ for different sorts of leathers and, partly in consequence, for different sorts of manufacturers. But without being able to specify the criteria at work, the important point is that these upper and lower bands do seem to exist. Beyond them, the risk in extending or contracting the market position increases at an extremely rapid rate.

Uncertainty. How does the confidence with which a given expectation is held affect the course of buying? Uncertainty has already entered the picture in connection with the differential risk involved in holding various sorts of leathers. High-style leathers are riskier investments than staples because demand for the former can never be assessed with the certainty possible for the latter. But uncertainty of this sort, which involves a prediction of sales rather than prices, will vary primarily among leathers rather than from one time to another. Not so uncertainty about price.

[18] I have found helpful ideas in the following discussions: G. L. S. Shackle, *Expectation in Economics*, Cambridge, 1949; E. S. Shaw, "Elements of a Theory of Inventory," *Journal of Political Economy*, August 1940, pp. 465–485; Nicholas Kalder, "Speculation and Economic Stability," *Review of Economic Studies*, October 1939, pp. 1–27; A. G. Hart, "Anticipations, Uncertainty, and Dynamic Planning," *Studies in Business Administration*, Vol. XI, no. 1, University of Chicago Press, 1940; and Kenneth J. Arrow, "Alternative Approaches to the Theory of Choice in Risk-Taking Situations," *Econometrica*, October 1951.

[19] Inventory loans are typically expected to be liquidated at certain times of the year—after enough time has elapsed for the seasonal peak in production to be followed by a strong inflow of cash from customers (see Morton Jennings, Jr., *Bank Loans of Shoe Manufacturers*, Rumpf, 1948, p. 200).

Since a man's conception about future prices involves uncertainty, it must also involve probability, including some sort of probability distribution. If he speaks of the expected price, he means no more than the most probable of the many prices that he thinks may prevail at the selected dates. Two situations with the same most probable price may differ with respect to the absolute probability assigned to the central and to all of the expected prices; they may differ likewise with respect to the dispersion of the other guesses around their central value. It seems inevitable that the higher the absolute probability assigned to each price and the more concentrated their array, the more likely a man will be to *act* in a situation involving risk on the basis of a given central expectation about the amount by which prices will change.

My impression is that shifts in a firm's advance buying are highly sensitive to alterations in the confidence with which an opinion about price is held. On the other hand, it seems likely that confidence has a temporal pattern both for any individual entrepreneur and for the market as a whole. It is likely to grow with the length of time for which expectations of change in a given direction are entertained. Also, like many social phenomena, confidence is likely to be contagious, as more and more customers, competitors, and suppliers come to hold a given opinion. Assuming for the sake of argument that the course by which a single individual achieves full confidence follows an additive path as optimistic omens cumulate, the market as a whole may well gather momentum according to a geometric rather than arithmetic principle. In both cases, however, the process is cumulative and likely to parallel more nearly the level of prices than their rate of change.

Margins

The influence of margins on inventory investment could take several forms. We have already suggested that the size of current margins and their cumulation in the form of liquid assets may influence the risk involved in a given extension of the advance position, under given expectations about sales and prices, under otherwise stipulated conditions of risk and uncertainty. But it is also possible that the size and recent history of margins will *of necessity* influence expectations about prices and demand, so that the *ceteris paribus* condition may not properly be imposed. The whole matter is of considerable interest in view of its potential importance to the process of business fluctuation.

The shoe manufacturing industry is one to which the classic characteristics of competitive enterprise are certainly not foreign. We learned in Chapter 2 that the industry has a large number of relatively small firms that compete among one another for customers and materials. But there are also some firms doing so large a proportion of the total business that they must explicitly consider the consequences of their actions on the industry at large. Moreover, each line of shoes has a smattering of the characteristics of a monopoly product, since comparisons among shoes by prospective customers are at best imperfect. Thus shoe prices have some characteristics of competitive, some of conventional, and some of managed, prices.[20] How the several strands intertwine is a complicated story that neither needs to nor can be told here.

RIGIDITY OF SHOE PRICES

One aspect of it, however, is material to the margin problem—the attitude of distributors. For they have been in a position in the interwar period to exert strong pressure on manufacturers' pricing policies. Retailers plan their stocks in terms of price lines or bands.[21] In general, retailers seem loath to alter their prices. Markdowns and markups are used to only a limited extent to bring actual stock in conformity with planned stock; the major expedient is adjustment of buying.[22] But more important in the present context, retailers resist changes in manufacturers' prices on new lines of merchandise.

Overt prices increase is perhaps the type of price change that is most stoutly resisted. When the pressure of increased costs on manufacturing grows too strong, changes in the quality of the shoe are, at least for a while, more likely to be accepted by the retailer than is an explicit price change that would necessitate departure from the customary price lines.[23] However, fear of alienating customers by price increases is less severe if merchants judge that the market is supported by strong consumer buying power. Retailers attempt to judge whether such support is present, by a nervous

[20] E. S. Shaw (*op. cit.*) has made a very interesting analysis of how these several price structures bear on decisions affecting inventories and output. He concludes that expectations of changing costs will cause no shifts in output (or buying) decisions in the competitive firm and limited shifts in the conventional-price firm, whereas managed prices bring out the full battery of effective shifts in both the volume and timing of output. For our purposes, the difficulty with this excellent study is that its conclusions rest on the assumption of upward-sloping marginal costs, and it seems highly questionable whether, in the very short-run decisions involved in capitalizing on market prospects, marginal costs are thought to be other than constant.

The exception might be a very large firm whose buying is of great enough volume to influence leather prices. Buyers of such a firm may properly visualize themselves as adding to their stock of leather on hand and on order along an upward-sloping cost curve as their buying raises the price of leather.

[21] See Chapter 8, p. 95.

[22] See Chapter 8, p. 104.

[23] When once price lines that have been used for some time have been changed, other changes may be made with less resistance.

reading of signs and footprints. Are consumer income and buying increasing in the aggregate? Is shoe buying increasing? Is there a tendency for consumers to trade up by asking for higher-priced shoes than they formerly asked for? Is there a tendency for them to buy more than one pair of shoes at a sitting? (This is a very bullish sign, though the multiple sale in the hosiery department may be a more sensitive indicator of increasing buying power.) Where increased prices have been tested, how have they fared? The tests may have been made within the store. But competitors make tests willy-nilly for one another.

The logic behind this behavior seems to posit that consumer demand for shoes is quite sensitive to price. Our investigations reported in Chapter 6 do not deny the validity of this notion, though they lend it only uncertain support. Only when consumer demand schedules shift as a result of increasing income are retailers relatively willing to advance prices. Finally, retailers' behavior suggests that they believe consumers are less sensitive to price change that takes the form of change in quality than to price change taking the form of overt change in price; and this certainly seems realistic.

The same logic that makes retailers wary of raising prices ought, it would seem, to make them interested in reducing them in line with a drop in the cost of manufacture. Yet I did not run across nearly as persistent pressure for price decreases as is marshaled against price increases. Certainly, here too, retailers are interested in shifts in demand schedules associated with drops in income that seem to require offsetting reductions in prices. But whether they typically think of price decreases as encouraging buying, other things (including income) the same, seems questionable.[24] At first glance, this may suggest that retailers conceive of consumer buying as more readily discouraged by rising prices than stimulated by falling ones, but this is doubtless a false deduction. In deciding at what prices to buy, considerations other than the price-sensitivity of demand enter, and several of these may be more important or have a different impact for rising than for falling prices. Thus when buying prices fall, inventory often must be marked down and the resultant loss on the large stocks of retail shoe stores moderates the desire for lowered prices.[25]

In general, then, the major impression seems to be that retailers' bargaining tactics involve resisting at least the early impact of changing costs of manufacture. Fear of adverse consumer reaction to rising prices and inventory losses when prices fall may well be the major motives. The force of these motives lessens after market trends have proceeded in a given direction for some time. Although the price paid to manufacturers for a pair of shoes does not necessarily determine its retail price, there seems to be a strong tendency for retail and wholesale shoe prices to move closely together.[26] Consequently retailers' willingness to change the prices that they charge their customers will have a strong influence on the direction and extent of price pressure that they bring to bear on their suppliers. During the interwar period, these pressures were substantial.

The buyer and seller, it will be recalled from Chapter 2, are not unevenly matched as to size—there are very large and very small firms in both camps. Moreover, though each transaction that is negotiated is in part an independent bargain, it is also part of a fabric that "makes the market." Thus, though in one sense the big retailer is a competitor of the small retailer and the big manufacturer a competitor of the small manufacturer, in another sense all retailers are allies in their struggle against manufacturers; the large firms steam at the head of the battle array.

In the interval between the two world wars the buyer was favored by basic economic conditions, and when this advantage was reinforced by economic depression, the large retailer proved a powerful antagonist indeed.

[24] An example of action motivated by consideration of price sensitivity of demand as the economist conceives it occurred in the case of two integrated manufacturing retailers of popular-priced shoes. Lagging demand presented the question of what price reduction would sell enough shoes to keep the factories operating at efficient levels.

[25] The effects of fear of loss on inventory decisions are not necessarily symmetrical to those of hope of gain. Fear of loss would be more telling when inventories are larger than desired (as during the early months of recession) than would hope of gain when stocks are smaller than desired (as during the early months of recovery). Other considerations that may have a different impact during recession and recovery are: (1) Knowledge that the impact on manufacturers' profits of rising direct unit costs during expansion is mitigated by the wider distribution of overhead consequent to increased output, and awareness of the reverse situation during recession. This may cause retailers to resist price rise in recovery and not push so hard for price declines during recession. (2) The fight with suppliers for power is likely also to have a different color in a buyers' than in a sellers' market. (3) Consideration of how consumers react to anticipated rather than actual prices may have an asymmetrical cyclical impact. It is possible that retailers think that consumers will hold off from buying if a fall in price causes them to believe that prices will continue to fall; whereas the conviction may not be so strong that consumers step up buying if a rise in prices causes them to believe that prices will continue to rise. In this case the unwillingness to reduce prices during recession would not necessarily be paralleled by the readiness to increase them in recovery.

[26] The margin is not identical for all shoes in a store; some will carry a higher markup than others. But retailers seem to aim to achieve a predetermined average markup for a line of shoes. Though the size of this average markup will differ for various lines, departments, or stores, for any one of them every effort is made to keep the figure fairly constant over time. The fact that markdowns have a cyclical pattern thwarts this objective as far as a maintained margin is concerned.

"While shoe manufacturers and trade in general do not like to admit the fact, more of them are coming to the conclusion that the standard of value and prevailing retail price levels are more than ever being established by a limited number of factors who have numerous distributing units throughout the country." [27] The article goes on to say that the popular-priced shoes which these distributors handle are sold by manufacturers at so small a margin that cost rises cannot be absorbed, whereas if increases were reflected in retail prices they would weaken the competitive position of the retailer. But though the popular-priced shoe is certainly important in this connection, the problem affects more than any one price range.[28]

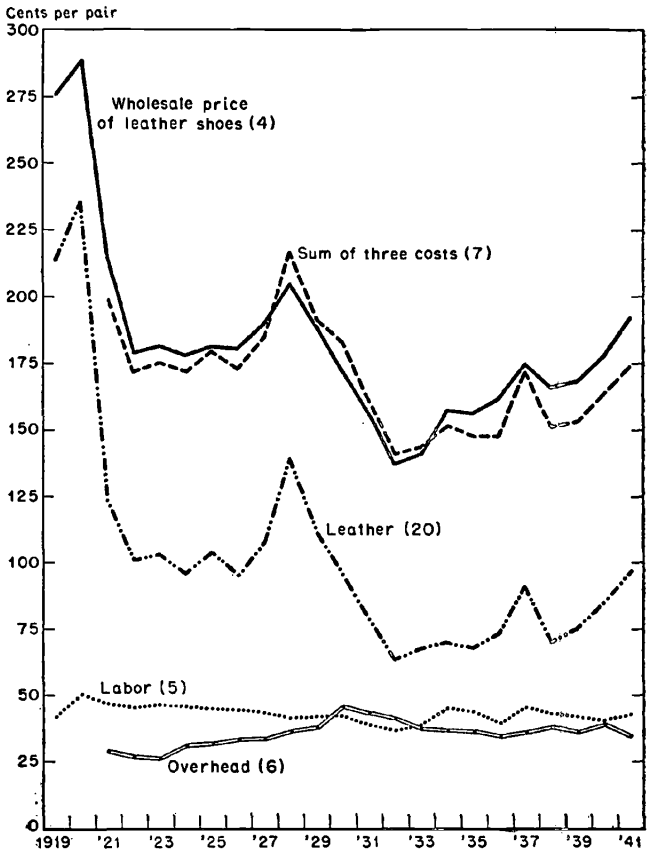
In view of retailers' interest in maintaining fairly stable prices, and their ability to urge their case effectively, the smooth course of shoe prices over the years is not surprising. In this connection, it should be recalled (see Chapter 6) that shoe prices and the cost of living as a whole followed quite similar courses. The wholesale, like the retail, price of shoes is relatively insensitive to subcyclical fluctuations; in both, major business fluctuations are reflected, though far more moderately than in the price of cattle-hide leather.[29] (Of course, shoe prices cannot remain unchanged when leather prices change sharply.)

COST-SAVING DEVICES

To produce shoes at relatively stable prices, in spite of the strong fluctuation in the price of leather and its importance in the cost structure, the quantity and quality of input items must be shifted.[30] A glance at Chart 24 shows how the current prices of the major material and of the finished article have moved together over the years.[31] It is easy to understand why leather prices change more, in percentage terms, than shoe prices; they typically represent between a third and a half of the total cost of shoes and thus can change materially without eating into the absolute margin for other costs and profits. But the chart suggests that in absolute quantities, too, they typically fluctuate more than shoe prices.

CHART 24

Major Cost per Pair of Cattle-Hide Leather Shoes, 1919–1941



Actually, leather costs do not fluctuate as much as the chart suggests since it is based on a fixed quantity and quality of leather input. The milder movements of shoe prices are facilitated by flexibility in the specifications for shoes to be sold at a given retail price. Manufacturers use this flexibility to meet changing leather prices so actual input costs do not rise as much in a

[27] *Shoe and Leather Reporter*, February 16, 1935.

[28] *Survey of the Shoe Industry in New Hampshire*, by Agnes L. Peterson (Women's Bureau, Dept. of Labor, Bull. 121, 1935, p. 17), covered twenty-eight firms that manufactured shoes made to retail at prices up to $10. "The cost of shoes has always figured prominently in the success of selling, but it was stated repeatedly that for some time shoes have been sold not according to cost of production but under what is called a buyers' market, where the retailer sets the price of the shoes desired and the manufacturer must meet that price or lose the sale."

[29] See Chapter 4, Chart 6 and Chapter 15, Chart 48.

[30] A typical distribution of major costs for shoe manufacturing might be as follows:

	(*per cent*)
Labor costs	20–30
Upper and sole leather	35–50
Other materials	4–7
Machinery	2–4
Other manufacturing	10–12
Selling, discounts, etc.	10–20

Data from the following sources provide the basis of the figures: *Census of Manufactures; Industrial Corporation Reports, 1939*, Federal Trade Commission; *Economic Data Series, No. 14*, Office of Price Administration; and L. O. Howell, *Marketing and Manufacturing Margins for Hides and Skins, Leather and Leather Products*, Tech. Bull. 961, Bureau of Agricultural Economics, July 1948. Detailed cost data were reported by H. A. Silverman, "The Optimum Firm in the Boot and Shoe Industry," *Oxford Economic Papers*, April 1942, pp. 95–111, and for four shoe firms in case studies on file at the Harvard School of Business.

[31] The computations on which they are based are discussed in Chapter 12. Some of the shortcomings of the calculations, a major one of which is the assumption of fixed leather input, are suggested by the relation between shoe price (which is itself based on a small sample) and the sum of the three sorts of costs.

rising market as would the cost of identical articles. This means that changing leather prices are first reflected in shoe prices in the form of changed quality rather than as an explicit change in price.

There is an almost infinite variety of ways in which input may be changed. In leather, calf may be substituted for kid, kip for calf, and cattle hide for kip. A poorer quality of leather, or one with more imperfections, may be substituted for a better quality of the same type.[32] The quality of soles, heels, shanks, linings, and findings may be imperceptibly changed. Or changes in the quality of these parts may extend to a substitution of one material for another—kid linings may be replaced with cattle-hide-split linings, which may in turn be replaced by cloth linings. Wooden heels are cheaper than leather heels, wooden shanks than leather or steel shanks, composition soles than leather soles. Large economies, particularly in the manufacture of women's shoes, may be effected through changes in the amount of handwork incorporated in the design. In a sense, the product also includes services to retailers which may be curtailed when necessary: credit, return privileges, a large assortment of in-stock models, short delivery periods. Some of the manufacturers' changes will not ordinarily be recognized by retail-store buyers,[33] but many will be undertaken and agreed on after consultation. Most will not be recognized as cost-saving devices by the final consumer—at least for a while. Conversely, a fall in costs may for a time be accompanied by changes of an opposite sort.

Another source from which changing unit costs may be met is the overhead type of expense. Often margins between direct costs and selling prices diminish just when the volume of output rises, and vice versa. Overhead per unit has the opposite pattern and thus provides a shock absorber. Finally, even were total unit costs of all sorts to rise (both absolutely and relatively) more than selling price as output increases, and profit margins accordingly to diminish per unit or per dollar of output, the larger volume of output might nevertheless cause aggregate profits and profits per dollar of invested capital to increase. These statements may be rephrased to apply to times of diminishing sales, costs, and selling prices.

[32] A certain amount of upgrading of leather presumably takes place in a falling market, and downgrading in a rising market. Hence statistics of leather prices may understate the true amplitude of fluctuation for identical quality of product. But poor-quality leather involves more waste in cutting and takes longer to cut, so the economies accruing through the buying of cheaper grades of leather are limited.

[33] A shoe manufacturer illustrated how he could reduce the cost of a pair of shoes 25 cents without most retail buyers noticing the changes: reducing the number of nails in the sole, setting the edging once instead of twice, using a paper instead of a leather insole, painting instead of staining the bottom, lengthening the stitches.

Once prices for the seasons' lines have been determined, manufacturers are loath to change them. If prices have risen, early buyers will sometimes be offered the old prices on their preseason orders. But otherwise it is considered poor policy to change prices in the course of a season. At least this is standard practice, though deviations occur, especially for individual customers. In order to determine how to design the season's line so as to earn an adequate profit, it is necessary to make a guess at what each major cost will average over the season. To make this guess for leather costs, it is necessary to make it for leather prices. But if leather prices rise, a shoe designed and priced to permit leather to be bought right along as it is required will have a higher price or poorer quality than one for which leather was bought early. This will put the former shoe at a competitive disadvantage. In other words, per unit margin between the price paid for leather and received for shoes depends on the relationship between three things: the actual leather cost for the season, the leather cost assumed in the design of the line of shoes, and the competitive soundness of the assumptions.

Since selling prices are hard to change over the season and the price of leather changes often, the shoe manufacturer is forced to take a position on anticipated leather prices, and he does this implicitly by failing to buy ahead quite as much as he does so explicitly by buying ahead. Consequently, one would expect him to consider the matter squarely and act in accordance with his best judgment.

Combining what we have learned about margins, about market prospects, and about the problem of providing the material required for shoe orders actually on hand or expected within the planning horizon, we envisage a fairly clear *period of option* during which the leather to be used in the manufacture of the current line may be bought. Just how the option is exercised—and it must be exercised implicitly if not explicitly—depends significantly on market prospects with respect to delivery conditions and leather prices (both what the prospects are thought to be and how firm the belief is). In all probability, a period of option of this sort leads to more shifts in ownership position than is likely to be found in an industry, of which cattle-hide tanning is an illustration, where selling prices have a sensitive association to current costs of the materials. The review of shoe manufacturers' problems also suggests that shifts in the size of stocks on hand or on order respond to the changing level of orders for shoes both directly and through the influence of the volume of sales on market expectations. Finally, the shifts appear to be subject to limiting influences of several sorts.