CHAPTER 16

CYCLICAL AND SUBCYCLICAL FLUCTUATIONS: STATISTICAL FINDINGS

Understanding the full role of consumption in business fluctuation involves knowledge of the conduct of businessmen as much as of consumers. Shoe retailers do not simply pass the demand of their customers back to their suppliers without alteration. They do not buy month by month what they sell; instead, they buy more or less. Changes in stock result. The same statement applies to the other steps in the vertical chain.

Yet it has become amply clear that the whole process cannot be understood by studying specifically consumer buying and changes in stock (even stock on hand and on order) at each of the earlier steps. Investment in stocks may not properly be thought of as the result of integral decisions concerned directly and primarily with inventory investment. It is inextricably one with the basic business problems of sensing and filling customers' requirements at a profit. In consequence, to investigate the problem set for this study, it has been necessary to trace first how consumer buying behaves and why; then how fluctuations in consumer purchases of our "case," shoes, are reflected in the earlier stages of production and marketing; and lastly, what other factors—most notably, price—contribute to the process as demand moves toward the raw hides markets.

In trying to solve this multifaceted riddle, we have used, as any conscientious investigator must, all the resources at our command—the all too sparse literature, interviews, time series, theoretical analysis. The relationship among the resources has interlocked incessantly—the interviews formed the questions and presented tentative answers to be checked, in an analytic framework, by the time series; the time series presented facts to be explained by the interviews or, together with the logical analysis, phrased more specific questions to be answered by new interviews or further analysis of time series. This is a lamentably subjective road toward objective truth. Oddly enough, it is its failures, more than its successes, that bolster confidence in it. I think now with pleasure on the months of miserable tussle with the material on tanners' operations. I started with ill-chosen questions, but the unsuccessful efforts to organize the empirical materials served to demonstrate that the figures could not easily be pushed around and made to tell a warped story.

Nevertheless, the superstructure of pattern and

theory built upon the facts, those derived from analysis of time series or from the isolated evidence of interviews, is too bulky for comfort. Unfortunately, it must remain so until buttressed by studies of other industries. It will be useful, therefore, to summarize the results of the investigations in two sections. In this chapter, the direct empirical findings are reviewed, presenting these bricks with little recourse to the cement of theory. The final chapter describes the house; it summarizes what has been learned in this industry concerning the cyclical and the subcyclical process.

Timing and Amplitude of the Several Activities

CYCLES AND SUBCYCLES IN THE INDUSTRY

Two sorts of systematic movements (other than the usual seasonal patterns of change) have been found in the shoe, leather, hide sequence. First, there are waves of activity that conform in general to business cycles as delineated in the National Bureau of Economic Research's business-cycle chronology. Second, there are a number of shorter waves broadly dispersed in many aspects of the industry. There were thirteen and one-half complete subcycles from the peak in 1923 to the trough in 1939 (an average duration of fifteen months). Incidentally, most of these fluctuations seem to appear at about the same time in a considerable variety of other fields. Because of the tendency for the shoe, leather, hide group to anticipate the business-cycle turns, the SLH-*cycle* turns tend to lead the corresponding business-cycle turns.[1] The SLH-subcycle and -cycle reference chronologies, which delineate the industry patterns, provide a frame with the aid of which a summary view may be gained of the sequence of events in the industry. By referring the timing and amplitude of the many activities to a reference chronology, the association between the many particular activities that have been studied chapter by chapter can be focused on a single screen and there examined. Appendix C contains two tables that afford the statistical background for this examination and considerable further detail.

[1] See Chapter 4, Table 9. The average lead for 7 matched turns was 2.3 months. Out of 9 comparisons that can be made, leads appear at 4, a lag at 1, and synchronous timing at 2.

RETAIL SALES

Consumer buying of shoes moved up and down with the major fluctuations in business affairs as a whole. Compared with other consumer goods, shoes are about halfway between the more and the less sensitive, showing a volatility similar to that of consumption as a whole.[2] Turns were roughly synchronous with those in business and consumer income. Transposed to the reference frame of the cycles in the shoe, leather, hide industry, at least dollar sales usually lagged. However, the small number of turns for which observations were available makes delicate conclusions hazardous.[3] But consumers' shoe buying moved up or down, with a persistence that does not seem attributable to random factors, at a number of times not listed as business-cycle phases. It exhibited, in other words, subcyclical as well as cyclical fluctuations. On the average, these turns (whether for sales measured in dollars or in pairs) occurred only a fraction of a month after the turns marked for the SLH industry as a whole. Only at the major peaks or troughs—the SLH-cycle turns—did the tendency for dollar sales to lag appear.

This fluctuating course of consumer buying does not trace graceful sine-like curves when divided into either major waves or into subcycles. However aggregate buying, at least in the phases lasting half a year or more, typically reaches maximum rates of rise or fall before —in the longer phases often considerably before—the last month of expansion or contraction, respectively.

The course of shoe buying appears to depend mainly on disposable consumer income. Nevertheless, dollar expenditure on shoes declined over the years (when other things, including income, are separately accounted for). However, the number of pairs bought increased, so that per capita pair consumption did not have a trend of either sort; during the interwar span, it remained about three pairs a person per year in good times. Finally, high shoe prices relative to other living costs may have had some tendency to discourage shoe buying, other things the same. Regression analysis for monthly data (1929–1941) showed that these three variables (income, trend, and relative price) accounted for monthly shoe sales with a correlation expressed by the coefficient .979. For annual data, the corresponding figure was .999. Disposable income accounted for much the largest part of the change over the period. At average levels, for every 1 per cent change in income, ag-

gregate shoe sales in current dollars changed close to 0.9 per cent—by slightly more when business was poor than when it was good.[4] These figures based on a period when income changed greatly ought not to be applied, without critical re-examination, to the post-World War II era when changes in income were less extreme and many other relevant factors, such as size distribution of income and the amount and distribution of consumer saving, had changed materially. Even for the earlier period, the minor fluctuations in buying were usually more extreme than corresponding ones in income payments; this may have reflected more or less systematic factors, namely, consumer stocks, expectations, and income distribution, whose influence could not be identified in time series. In a few cases, factors operating at a particular time, such as special expectations about changes in price, or income, or even outstanding style developments, may well have been partly responsible for the otherwise "unexplained" behavior of consumer buying.

OUTPUT AT EARLIER STAGES

The production of shoes and the production of cattle-hide leather are likewise subject to cyclical and subcyclical fluctuation. For both activities, fluctuation is at least double that of retail sales measured in pairs of shoes. Actual "production" of hides (if one judges by the only statistic available, federally inspected slaughter), though subject to some innate fluctuation, conforms poorly to the fluctuation of the shoe, leather, hide industry as a whole. For the three stages that keep step with one another, retail sales, shoe production, and leather production, turns tend to occur at about the same time.[5]

ORDERS AND RECEIPTS

The virtually synchronous timing association between the three major production stages implies a difference among them in the timing of orders. For, retail sales in effect record the volume of orders by consumers, and turns in the volume of orders at earlier stages seem to lead those of consumers' orders (retail sales). This lead, which averages about two months, appears at the first

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[2] See Chapter 6, Table 21, and Chapter 5, Tables 16 and 17.

[3] For the four major turns 1929 through 1938, which are the only ones for which consistent comparisons can be made, the timing was as follows: pair sales, business-cycle chronology, +2, −7, 0, −1, SLH-cycle chronology, −1, +1, +1, +3; dollar sales, business-cycle chronology, +2, 0, +4, −1, SLH-cycle chronology, −1, +8, +5, +3.

[4] See Chapter 6, Table 22.

[5] In Chapters 3 and 4 we noted that four, rather than three, stages kept step with one another, the fourth being movement into sight of cattle hides. In Chapter 14 it became apparent that the sensitivity of this series to fluctuation in the industry was contributed by the behavior of two of its components, imports and uninspected slaughter, neither of which represented the first appearance of hides on world markets. Imports record, of course, the arrival of foreign hides in this country rather than slaughter; the series for uninspected slaughter after 1932 is actually receipts of country hides by tanners, and before 1932 it provides a very doubtful representation of actual slaughter as distinguished from tanners' receipts.

step in the sequence, wholesale sales. It seems to be maintained, but not increased, at each earlier stage.[6] Characteristically, the leads are short and regular, and often longer at peaks than at troughs.[7] Orders or receipts have a greater innate cyclical and, particularly, subcyclical fluctuation than the corresponding output flows. Since the timing of leather and shoe output can readily be explained in terms of the patterns of shoe and leather orders—quite regularly orders lead by long enough for output to be forthcoming—these figures spell out the real puzzle on the solution of which the inquiry has focused: why orders behave as they do.[8]

INVENTORIES

Timing and amplitude relationships between output at contiguous stages carry implications for stocks on hand and on order and their month-to-month change (inventory investment, measured always in physical terms or at constant prices). Inventory investment of retailers rises as sales rise and falls when they decline. Over subcycles, these changes in stocks share the responsibility for ups and downs in shoe production at least equally with fluctuations in consumer buying. Over cycles, however, inventory investment plays a rela-

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[6] Evidence is partly that of timing comparisons for wholesale sales, shoe orders, shoe and leather orders, shoe manufacturers' receipts of leather, and tanners' receipts of various sorts of hides and hypothetical hide orders. It is also partly inferential.

[7] For some of the data, leads are clearly longer at reference peaks than troughs and certainly this seems reasonable. We see this most clearly in wholesale sales (pairs), tanners' receipts of country hides and tanners' receipts of imported hides.

The figures, along with some useful comparative data, are given below. The "consistency index" records the number of times that the timing of a peak minus that of a previous and of a following trough has the same sign as the difference in average timing (see Appendix A, Sec. 11b, ¶ 4).

	AVERAGE TIMING Peak minus Trough (months)	INDIVIDUAL TURNS Consistency Index
Wholesale shoe sales, dollars (34)	+0.2	0
Wholesale shoe sales, pairs (35)	−1.5	54
Shoe and leather orders (38)	−1.5	14
Tanners' leather shipments (89)	−0.5	20
Hide receipts of tanners (103)	+1.2	35
Receipts of packer hides (108)	+0.7	6
Receipts of country hides (107)	−2.8	53
Receipts of imported hides (105)	−1.6	52

[8] Evidence on this point comes largely from the short series on shoe and leather orders and from statistics on receipts of leather by leather-goods manufacturers and of hides by tanners, for receipts are more similar to orders than is output. Receipts of tanners have a special trait: domestic packer hides reached peaks and troughs well ahead of total hide receipts and even of tanners' leather shipments. In this they exhibit the characteristic that I attribute to the "at-once" order for shoes.

See Table 32, and Chapter 7, for a discussion of the association of orders and output of shoes. For leather, the timing relationship that would permit orders to eventuate in output cannot be sharply specified because of the tolerance for inverse movement of stocks (see Chapter 13, particularly pp. 179–180).

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tively less important part. The rate at which stocks of shoes change appears to reach maxima and minima at about the same time, on the average, as retail sales. By implication, retailers' investment in stocks on hand and on order (their ownership position) will not only have a considerably larger amplitude of fluctuation than their sales but will lead them, since orders do. There is some evidence that this is the case, and that the leading pattern has a marked parallelism to changes in hide prices.[9]

Retailers' shoe stocks proper rise when sales rise and fall when they fall but not by as much proportionately as sales. They reach peaks and troughs later. What can be learned of retailers' problems and procedures suggests that stocks may be positively associated with sales and inversely with their rate of change, and regression analysis supports this view.[10] But when shoe prices rose materially, stocks seemed to be accumulated in greater quantity than usual. This was apparent in the fact that stock, instead of turning over at the increasing rate normal to a period of rising sales, began to rise proportionately more than sales.

The temporal association between shoe production and leather production depends on decisions by shoe manufacturers about buying and by tanners about selling and producing. Consequently, how the intervening stocks—total stocks of leather—behave has little causal stability or meaning, for they are the sum of two distinct stock piles governed by different forces. When total leather stocks are divided into the portion held by leather-goods manufacturers, on the one hand, and by tanners, on the other, strong and important fluctuation in each is immediately apparent. It is typical of shoe manufacturing that, for a while, more leather enters the plants than leaves in the form of finished shoes; and then for a run of months the reverse situation applies. The resulting subcyclical fluctuation in inventory investment reaches peaks and troughs, on the average, about three months before the corresponding ones in output. The lead in inventory investment means that fluctuations in leather entering shoe manufacturing plants are not so extreme as they would be if output of shoes and changes in manufacturers' stocks of leather reached their maxima and minima at the same time. Nevertheless, the leather entering shoe-manufacturing plants is subject to considerably greater fluctuation than leather emerging from the production process in the form of finished shoes. The difference is far more marked for subcycles than for cycles alone. Here, as for retailers, fluctuation in stocks is responsible for at least as much of the subcyclical fluctuation in receipts as is that of finished output; here again, its relative

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[9] See the sections of Chapter 9 on the "market profile," and Table 40.

[10] See Chapter 8, Chart 17.

contribution to the major fluctuation is considerably smaller.

Shoe-manufacturers' leather inventories proper display a conforming and synchronous association to the reference scheme. This picture, taken in conjunction with the leading rate of change, seems at first glance to correspond to those displayed in the usual acceleration models. But there is reason to believe that the pattern is due as much to considerations focusing on market conditions and the advantageous timing of buying as to any enforced link between stock and the rate of change in output. This interpretation falls in line with the way businessmen describe what they do and with what is known of the facts about deliveries and prices with which they must cope. Furthermore, it is visible in the monthly time series in the form of the quite close association between fluctuation in leather stocks and recent change in hide prices or of the synchronous association between change in stocks and change in prices.[11] A regression analysis "explaining" inventory investment on the basis of changes in leather consumption and in hide prices reproduced most of the fluctuations, though the extent of the movements is underestimated.[12] Though certainly these comparisons partly reflect the impact of inventory investment on prices, they reflect also at least some causal association that runs from prices (as an indicator of market prospects) to shifts in market position and to consequent inventory investment. The data indicate that these shifts do not, however, continue without limit; the number of weeks' supply of leather on hand virtually never fell below one and one-fourth months' supply or rose above two and one-third months' supply.

Investment in leather stocks by tanners behaved in a precisely opposite fashion to investment by shoe manufacturers; it fell during recovery and rose during recession, reaching peaks and troughs almost exactly when investment by leather-goods manufacturers reached troughs and peaks. The impact on tanners' operations, and especially on their buying, of this inverse and leading pattern of their inventory investment in finished leather was partly counteracted by a direct and leading pattern of their inventory investment in raw hides and in leather in process. For the positively fluctuating group, it was not possible to detect in the statistics a systematic association between behavior and any logically associated causal factor, with the exception of the relationship between the output of sole leather and the size of in-process stocks, and the process of producing and selling leather and of buying hides makes this very lack of sharp inventory management seem reasonable. There were, however, occasions

when tanners' stocks of raw and in-process hides on hand and on order grew heavier than usual, relative to output, though output was rising. These were times when hides may very properly have been thought of as a good buy at the price.

Tanners' total stocks of hides and leather (measured in physical units) do not change systematically over cycles and move inversely to output during subcycles. They resemble in their stability the walls of the plants in which they are to be found and, like them, are larger per unit of output when business is low than when it is high. Measured in dollars, however, the heavy fluctuations in the current value of a hide, and the conformity of hide prices to fluctuations in output, mean that the money tied up in stocks bears, in good times and bad, fairly constant relationship to the year's sales of leather.

The clearly conforming behavior of leather production and the unresponsive behavior of cattle slaughter means, of course, that hide stocks as a whole move inversely. Packers' hide stocks have a strong inverse pattern; inventory investment in them, matched inversely, leads the SLH reference chronology by several months. Total hide stock of all holders throughout the world, though we cannot view it in figures, must be very large indeed. Some of it, because of poor quality and inaccessibility, is not typically even a potential supply for any given market. In total, it provides a reservoir responsible for the fact that tanners' hide receipts are highly responsive to demand. When American demand and price are high, more hides move to central markets of this country than when both demand and price are low.[13] World stocks, like total stocks in this country, certainly conform inversely to fluctuations in demand.

The distinctive and characteristic patterns of the several stock piles in the vertical sequence—conforming and lagging stocks of retailers, conforming and synchronous raw and in-process stocks of shoe manufacturers and tanners, and inverse stocks of leather or hides awaiting sale by tanners or by packers and dealers —repeat the general descriptions that Abramovitz has outlined for many sorts of manufacturers' stocks in his excellent book.[14]

For each group of businessmen who participate in the marketing and conversion of cattle hides into shoes, the behavior of their total stock depends upon the relative size of raw, in-process or finished stock piles, which, in turn depends on the combination of physical, finan-

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[11] See Chapter 12, Tables 44 and 45.

[12] See Chapter 12, Chart 29, and Table 47.

[13] There is no reason to expect that the rate of change in these stocks, or of the supplementary supply in this country, would show the same lead that change in domestic packer hides does. For the flow of packer hides to tanneries has a clear lead relative to the flow from back country or abroad.

[14] Moses Abramovitz, *Inventories and Business Cycles*, National Bureau of Economic Research, 1950.

cial, and institutional characteristics of the process in which they engage. For packers, we have studied only hide stocks, and these show the inverse conformity to subcycles and cycles in the industry typical of stocks awaiting sale; tanners' stocks (since the inverse movement of finished leather stocks more than counteracts the positive movement of raw and in-process hides) have a mild inverse conformity to subcycles and a neutral relation to cycles; shoe manufacturers' stocks (since stocks of finished shoes are small) would have the positive conformity to subcycles and cycles that characterizes their leather stocks; retailers' and wholesalers' stocks conform positively. During cyclical or subcyclical expansion, then, a relative shift in the hide content of stocks toward the finished end of the pipeline must take place. The shift would be emphasized if stocks were measured after taking account (at constant prices) of value added in the course of processing.[15]

The behavior of total stocks depends on the behavior and relative size of stocks held by the several agents of production. Alternatively, it depends on the amount held as stocks awaiting sale rather than awaiting processing at each stage; in either case, the large positive conforming stocks of shoe distributors have a strong influence on the aggregate. For the shoe, leather, hide industry, total stocks may be computed in two ways. First we calculate simply the hide content of shoes, leather, and hide stocks in all hands; next we include, in effect, value added at constant prices.[16]

In order to summarize the quantitative impact of fluctuation in stock, it would be useful to develop, for the entire industry sequence, estimates of the relation between fluctuations in input, output, and stock change similar to those computed for each of the stages. The relevant data are hide movement into sight, retail sales of shoes, and change in stocks of hides, leather, and shoes. But calculations are embarrassed by lack of correspondence in the three sets of fluctuations; the picture depends on just how the comparisons are made. Using the industry chronology as the frame of reference, stock change seems to absorb no more and perhaps less of the

total fluctuation in the movement of hides into sight than do retail sales—less when calculated in terms of hide content than in terms of value at constant prices. For the major movements, SLH cycles, the part played by change in stock may be somewhat smaller relative to retail sales than for subcycles, though not sharply or consistently so. In view of the large aggregate size of stocks, well over a year's supply, percentage fluctuation in stocks is mild.[17] The one major impression conveyed by the effort to picture and evaluate the behavior of aggregate stock of shoes, leather, and hides is that these total stocks are flabby and amorphous. True, they exhibit the positive lagging conformity ordinarily attributed to stock aggregates, and this has economic implications when considered in the context of the economy as a whole. The overbuying of prosperity must be shriven by the underbuying of recession, as consumers gradually use up (with or without the aid of reduction in prices) the supplies considered excessive. But for a commodity such as shoes, which has only mild cyclical and subcyclical fluctuation, the absolute impact on purchasing power of a change in stock of the order of magnitude that we find is not large. Our calculations suggest that probably no more than about half a cent of every consumer dollar spent on shoes during a recession was applied to the using up of excess stocks of shoes, leather, and hides.[18]

The importance of stocks to the process of fluctuation in this industry lies in something other than these aggregates. We need only to reflect once again on the behavior of each of the stock pools that have been encountered in these pages to recapture a sense of liveliness and significance. Most of the change in these several pools cancels out when they are summed. Still more lively and significant is the behavior of the several pools of stock on hand and on order even though total fluctuation in orders outstanding and unfilled orders precisely cancel out (except at the two ends of the sequence) for the total world supply of hides, leather, and shoes. Further, each of these pools is itself a complex aggregate in which opposite behaviors cancel; for example, division into stocks of firms whose business increased or decreased more or less than expected would add further vivacity to the picture.

But no matter how appropriately they are subdivided and measured, the behavior of these stocks, even including the total ownership position, is a small part of

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[15] The positively conforming stocks of shoe distributors and manufacturers receive a heavier weight. The shift from raw stocks to distributors' finished stocks is probably shared by many industries. The shift from the first manufacturing stage to the more finished manufacturing stage may well be less common (see Ruth P. Mack, "Characteristics of Inventory Investment: The Aggregate and Its Parts," in the forthcoming volume of Studies in Income and Wealth, Volume Nineteen, Princeton University Press for National Bureau of Economic Research, in press).

[16] The problem involved in the first calculation is obvious; for its solution, see Appendix B, Series 118. The second calculation is similar to those ordinarily used for national product analysis though the technique of calculation is reversed: we convert physical volume figures to constant prices rather than deflate dollar figures for change in prices (see Appendix B, Series 119).

[17] See Chapter 2, note 38.

[18] This estimate utilizes the reference frame. Specific fluctuations in stock are, of course, larger—perhaps again as large.

The corresponding statement for recovery requires a closed system and is therefore not realistic for a single industry. If the total economy were included, then the statement in the text may be reversed to apply in recovery: production for stocks would have distributed to consumers one-half a cent for every dollar they spent on shoes.

their significance to the process of fluctuation. This significance lies primarily, we have seen again and again, in their meaning in terms of business judgments and objectives; in their link to decisions to buy, produce or sell; in their link to prices. At this point—and it is the central and vital one, especially in the context of subcyclical fluctuation—the problem of stocks and stock change merges with all other business problems.

PRICES AND MARGINS

At the finished end of the chain, prices seem to be relatively unresponsive except to major changes in basic business conditions. Wholesale shoe prices reflect the major fluctuations in business, but not, except on particular occasions, the minor ones. Both retail and wholesale prices move tardily.

The price of cattle-hide leather moves up and down in synchronous or slightly lagging [19] conformity with the subcycle chronology for the industry. Reported prices, which must understate brief ups and downs actually experienced, show a severity of major fluctuation ranking near the top of our entire list of data, though their subcyclical fluctuation ranks in the lower half.

The price of cattle hides is subject to by far the most extreme cyclical fluctuation and is in the higher brackets of subcyclical movement. On the average, prices are synchronous with the reference chronology for this industry, though hide prices are one of the leading price series for business cycles as recorded in the National Bureau reference chronology. Characteristically, subcycles in hide prices reach a maximum rate of rise several months before they start to fall; they also retard before they rise. Hide prices cease to rise at an increasing rate well before the turn in the shoe, leather, hide industry and cease to fall at an increasing rate somewhat before the trough.[20]

The differential movements of prices have implications for the spread between the cost of the major material and the selling price for each set of operations. These spreads, in turn, influence decisions to buy and sell. No conclusions can be drawn for retail stores on the basis of a comparison of retail and wholesale shoe prices; if differences in margins are present, they are subtle, and neither price series is reliable enough to reveal them. For shoe manufacturers, the spread per pair between current prices of leather and cattle-hide leather shoes, assuming a fixed leather input, drops sharply when business improves and widens when it

deteriorates. However, this inverse behavior of unit margins may have natural limits, for the margin over leather and material cost per pair of shoes seems to have stayed within a well-defined band.[21] Tanners' margins over hide cost per physical unit of cattle-hide leather, calculated on a strict last in, first out basis, are a larger absolute (though not percentage) amount when leather prices approach subcyclical highs than lows. But this systematic behavior disappears if margins are approximated on some basis other than that of current hide costs. Significantly, however, tanners' margins seem to vary within quite a small range in spite of the wide fluctuations in leather and hide prices. This suggests what men in the industry affirm, that actual and expected price spreads influence buying endeavor and vice versa. The spreads are thereby stabilized.

Price seems also to influence flows of goods in connection with the choice among the several sources of the hide supply. The rate at which prices change slackens as tanners shift the emphasis of their buying from packer-hide markets to supplementary supplies that lie farther afield. Also, the relative importance of the two sections of the supplementary supply, country and imported hides, seems to shift in accordance with the relationship between the prices of corresponding sorts of hides.

The investigation has revealed still another manifestation of this delicate contrapuntal relationship between prices and physical flows. Regression analysis of hide prices for 1922 to 1939 reproduces quite faithfully most of the minor as well as the major movements in monthly prices. The "explanatory" variables were shipments of leather to leather-goods manufacturers and a ratio expressing the proportion of stock awaiting sale relative to the proportion awaiting processing. A positive association between hide prices and the price of cattle-hide leather shoes was also suggested both by reasoning and by the data.

This description presents a complex network of facts that an explanation must comprehend. The sequence and the amplitude of fluctuation is prescribed for output at each of the five stages, for shipments or orders at a few stages, for stocks and inventory investment in seven different stock piles, and for four sorts of prices and the relationship between buying and selling prices for two sets of enterprises. Investigation has also prescribed relationships among the various types of data— output, stocks, prices—with which an explanation must be compatible. What may that explanation be?

[19] The conformity is about as close when a lag of one month is allowed for as when turns are counted synchronously.

[20] See Chapter 15, Table 60.

[21] The band had, it will be recalled, an upward trend which may or may not have been realistic (see Chapter 12, Chart 27).