10. *Causes of Fluctuation in Ownership: Market Conditions*

That many sorts of factors other than an intended efficient association with sales can influence ownership has appeared and reappeared in the examination of the function that stocks serve in Part I. For one thing, targets are not met, so that changes in stocks reflect errors rather than intentions of any sort (except the intention not to pay the price of strict enforcement). The opportunity cost of flexibility in production or sales may have its impact on the uses to which stocks are put; these costs change in the course of business fluctuation and thereby change the desirable volume of stocks. The costs of stocks themselves can alter during business fluctuation, thus inducing changes in the size of stocks, other things the same. But the difficulty of giving these influences statistical form means that they must be largely ignored for the present. We are forced to look, not where ideally we would like to, but where the light is good. And the light shines, or at least glimmers, on market prospects.

Changing market prospects can be thought of as influencing primarily the *timing* of buying. Goods which in any event are expected to be needed at some particular time do not need to be bought at exactly that time minus a fixed interval—a uniform period required for their delivery and preparation. Instead they can be bought quite a bit earlier if there is reason to do so. On the other hand, they can be bought as close to the time when they are needed as possible; or since inventories can be drawn down, they may not for the time being be bought at all. The point is simply that there is what may be called a "period of option" with respect to the timing of buying. The way in which this option is exercised is influenced by market prospects.

REASONS FOR MARKET-ORIENTED SHIFTS IN THE TIMING OF BUYING

Changing conditions in the markets in which materials or merchandise are bought can affect the time when goods are purchased, goods which are in any event expected to be needed for resale or processing. Conditions in materials markets capable of influencing the timing of buying are doubtless of many sorts, but perhaps three dominate. They concern: (1) expected price of materials (this includes payment terms and free services as well as explicit price), (2) delivery periods and the buyers' confidence that deliveries will be made when promised, (3) quality, in general or with respect to particularized specifications, the range of selections, and the buyers' confidence that standards will be met. Though all of these matters can theoretically be reduced to a price differential, I believe that they are actually thought of by business as particular sorts of penalties or advantages, and therefore they are best considered separately.

If conditions change or are expected to change, how does the buyer behave? We can consider the question with respect to tighten-

ing markets without burdening the discussion with the counterpart of these statements covering slackening markets.

With respect to prices, it is anticipated rather than actual change which theoretically governs actions. Starting with a volume of stock which is efficient, assuming that prices and other market conditions are stable, the increase that is justified by an expectation of a stipulated rise in prices is a negative function of the cost of carrying the additional stock and a positive function of the expected *change* in price over the relevant period of anticipation, discounted for uncertainty. Extension in stock is justified as long as the positive advantage of further extension is greater than the associated cost. Thus the *level* of stock is governed by the *change* in prices. Since this point plays some part in later discussions, a brief illustration may be in order.

Suppose one month's supply is 100 units and it costs $9 to carry 100 units for one month. One month's supply is the normal physical requirement for efficient servicing of sales. Then, if prices are expected to increase 10 cents a unit over the next month, the purchase price of the 100 units would be $10 less if the goods were bought now than if they were bought one month later, when they would in any event be required. Since it would cost $9 to hold the extra supply, there would be a net saving of $1 and the advance purchase might be made if all costs were included and forecasts were, miraculously, believed to be certain. If, next month, prices were again expected to rise 10 cents, only the usual one month's supply could be purchased, since to do so would maintain the two months' level of stock with its attendant cost. If in the following month prices were expected to cease rising, there would be no buying since ownership should be reduced to the pre-rise one month's level because there would now be no offset to the $9 carrying cost of the extra month's stock. The level of price-linked stock, then, is a function of first differences in prices, other things, including uncertainty, the same.

Whether the identical logic applies to goods outstanding as well as to stocks on hand depends on whether there is a definable cost to holding goods on order. Certainly, since financing and storage costs typically do not commence until deliveries are received, the cost of holding goods on order is less, other things the same, than that of goods on hand. Perhaps the major cost of outstandings is that of risk—risk of buying goods that cannot be used at all or used as advantageously as some alternative. For these costs, whatever they are, the same logic would apply as previously sketched for stocks. Thus purchases to anticipate a rising price should ideally remain undelivered as long as feasible, since the cost of making a bet that prices will rise is thereby minimized. In any event, an increase in stocks on order is likely to involve, before long, at least some increase in stocks, and thereby blur the distinction.

If the buyer fears that his quality specifications will not be met, his defense again consists of *anticipation* of the event. Since quality deterioration is actually a de facto price increase, the response would be governed in the manner just described.

In connection with a change in delivery periods, either actual or expected change would presumably elicit a similar response. Goods on order would be increased to cover the same number of weeks' supply, but for the longer period—the new replenishment period. The delivery period is in effect a "process time," as discussed in Part I, and as explained there, stock which serves to bridge process time typically needs to increase proportionately to change in process time. In addition, the longer replenishment period demands somewhat greater insurance stocks on hand as well as on order. Thus ownership associated with this function would presumably increase slightly more than proportionately to a change in replenishment time, other

things the same. This remark would apply to expected replenishment time, except that it might be discounted for uncertainty.

The previous paragraph assumes that there are no alternatives to the increase in delivery periods. But actually, of course, there are. Many sorts of materials may be purchased from the same, or more probably other, suppliers at a price high enough to command swift delivery. The price ordinarily is not simply a monetary one, since it may imply poorer service or other penalties. It seems likely, therefore, that if producers feel quite sure that delivery periods will lengthen, they will often prefer to purchase ahead, because the carrying cost, including risk, will often be less than the penalty of buying later for swift delivery.

However, often this preference cannot be exercised. For one thing, suppliers may not be willing to fill up their future plant capacity at current prices. They may worry that buying is unrealistically extended and therefore that orders will not remain firm or that returns and requests for delays and other concessions will develop. Perhaps the most usual reason for unwillingness to accept orders for longer delivery is simply that orders are already sufficient to plan future output efficiently over the convenient planning horizon. If the regular suppliers are not willing to write advance orders, goods must be picked up for prompt delivery elsewhere.

Purchases for prompt delivery also may constitute the part of response to expectations of lengthening replenishment periods since a transaction period needs to be covered. Materials are in a sense running away from the purchaser when delivery periods lengthen, and he may have to buy some ready supplies to sustain him while he catches the withdrawing ones.

These paragraphs imply that the response to the expectation that delivery periods will lengthen is very likely to be not only an increase in advance orders but also an increase in purchases for immediate delivery, and consequently of materials stocks on hand. This is true even if we assume that expectations are held with assurance.

But, of course, expectations seldom are sure. For example, if purchasing agents are not very sure that markets will tighten, they may prefer not to extend commitments but to take a chance on having to pay premium prices for swift delivery *if and when* actual tightness develops. They exchange a sure cost of advance buying for a possible cost of a premium price.

In connection with the possibility of prices rising, uncertainty reduces the degree of extension that a purchaser would undertake. In connection with the possibility of a fall in prices or a shortening of delivery periods, uncertainty reduces the degree of retrenchment that is undertaken. In other words, in deciding by how much to alter his positions on the basis of judgments about market conditions, the expected gain is discounted for uncertainty and therefore the action taken is less than it would be were expectations sure.[1]

I have been discussing various manifestations of changes in market conditions and this implies the conceptual frame of "other things the same." But the introduction of uncertainty plays havoc with this handy conceptual tool. Over a period of months when business is expanding or contracting, the presence of uncertainty changes what is done; but uncertainty is itself changed by what is done. How then can one abstract from such change in order "to hold it the same"?

Two other factors that are likely to change concurrently with actual or expected market conditions are the cost of capital, which is relevant to stocks of goods on hand, and the cost of the risk of buying goods that are not needed,

[1] Price theory distinguishes between the character of risk premium for buyers and for sellers. It is assumed that buyers consider themselves more vulnerable to an error of underestimating a fall in price than of overestimating a rise; the opposite assymetry applies to a seller's reactions. See Oscar Lange, *Price Flexibility and Employment,* Bloomington, Ind., 1944, pp. 30, 31.

which is relevant to stocks either on hand or on order. This occurs, for example, when there is a change in the backlog of sales orders, "back orders" that a manufacturer has on hand. If materials are bought to cover an order which is on the books, the chances of buying materials that will not be used are minimal. For durable goods manufacturers these back orders are, as we have seen, both potentially large and highly variable. Their size, accordingly, can alter the risk cost of changes in outstanding purchase orders or stock on hand.

I have mentioned three major sorts of changes that can prompt a change in ownership position—actual or expected change in materials prices, in quality, or in replenishment time. *But it seems characteristic of market behavior that all of these changes tend to occur at the same time.* An individual buyer can, therefore, view his problems in any or all of these ways and still be *impelled to do the same thing at the same time.*

These notions about the factors that influence market prospects imply changes in purchasing behavior. Is there evidence that such changes actually occurred?

We want to examine the time series, first, to see whether there are indications that changes in market conditions appear to have been associated with changes in ownership. To do so requires that the impact of changing levels of sales of the company's product has been removed from the ownership statistics. Second, we want to try to learn which causal factors may, on the basis of the evidence, have played some part in the over-all changes in ownership that took place. Needless to say, the data can at best be suggestive.

Data for the durable goods industries are examined first and followed by the meager materials for department stores. The last section of the chapter addresses itself to the frequently asked question whether changing conditions of supply are primarily responsible for changing market expectations, and the role of capacity limitations is examined. These investigations, along with those of the previous chapter, prepare the way to tackle in the following chapter the slippery problem of the interrelations among the whole battery of influences that interact to create the inventory cycle.

OUTSTANDING ORDERS AND MARKET CONDITIONS

The most direct response to changing market conditions is the change in ownership of materials. The two parts, stocks and outstandings, can supplement or substitute for one another. But following the logic of the previous discussion, changes in stocks on order probably represent a lower-cost response than do changes in stocks on hand. Accordingly, outstandings may react more sensitively to changing conditions. In any event, evidence on the impact of market conditions afforded by stocks on order is not as confused by other matters (the level of sales or of production, and failure of expectations to come true) as is the evidence of stocks on hand. Consequently we examine the two parts of ownership separately and focus particularly on outstanding orders.

Cascaded Order Terms

Just how total outstanding orders change is complicated and it is necessary to understand it before looking at the evidence. Outstandings at any given time have typically been ordered at different times, not only because the interval between orders is usually shorter than an average delivery period, but because delivery periods themselves vary for groups of items on order.

Retailers, for example, will often order some portion of the expected requirements of style goods for the "season" at the time when lines are first shown by manufacturers. The proportion of these "preseason orders" may for some lines be as high as 70 per cent and for others

as low as perhaps 30 per cent of the expected season's requirements. The proportion varies with types of merchandise and market conditions. Order terms for these purchases may be, say, two months or more. Other purchases will occur as requirements clarify and selling needs move closer. These "secondary orders" may, to pick an illustrative figure, be placed for delivery in four to six weeks. Finally, retailers' "fill-in orders" or "at-once orders" may reflect last-minute needs of several sorts. Manufacturers, on the other hand, may tend to order all of some sorts of materials and none of other sorts for relatively distant delivery, so that the range of order terms may tend to apply primarily to different materials and only secondarily to portions of the total requirements of each.

The Structure of Ownership

Procedures, in other words, differ widely. But in one way or another, a variety of delivery terms is likely to be usual for all materials outstanding at a given time. The range of these terms and their relative importance in total outstandings will shift as market conditions change. It will be useful to consider briefly just how these shifts, associated with the several sorts of conditions that affect outstandings, gradually envelop the totals of materials on order at given times. For this purpose an illustrative example is required.

AN ILLUSTRATIVE EXAMPLE

Consider the composition of ownership with respect to two aspects of each item bought: the time when it was ordered and the time when it is generally expected to move to production or selling floors. Ten units are bought each period and they are distributed with respect to delivery period in the following way: 3 units immediate, 5 units at end of two periods, 2 units at end of four periods.

In a retail store a distribution of this sort could mean that of the estimated requirements for the season, some 30 per cent was bought for immediate delivery, 20 per cent when lines were first shown, and 50 per cent at an intermediate time. In a manufacturing establishment it might represent the relative importance of various products characterized by different delivery conditions, though some of the cascaded aspect may also apply. The figures are merely illustrative of the point that some materials and some portion of most major materials are bought further ahead than others. "A period" can conveniently be visualized as two weeks.

Assume orders are placed at the beginning of a period; "immediate delivery" occurs at the end of the period (beginning of period

Structure of Ownership, Units

Time When Order Was Placed	*Time When Use Occurs* — *Number of Periods After Time 0*							*Total by Time Ordered*	
Number of Periods Prior to Time 0	1 *In Stock*	2	3	4	5	6	7	*Units*	*Per Cent*
				On Order					
0			3		5		2	10	20.8
1		3		5		2		10	20.8
2	3		5		2			10	20.8
3		5		2				7	14.6
4	5		2					7	14.6
5		2						2	4.2
6	2							2	4.2
Total by units	10	10	10	7	7	2	2	48	100
Time used, per cent	20.8	20.8	20.8	14.6	14.6	4.2	4.2	100	

2). One period is required for preparation, so the earliest that these items which are purchased (time 0) can enter production is during period 3. Maintaining the same differential, those bought for delivery two periods hence arrive at the end of period 3, and so are ready for use during period 5; those bought for four-period delivery arrive at the end of period 5 and are ready for use during period 7.

Assuming there has been no change in this pattern of buying for seven periods, then the 48 units on hand and on order are analyzed, with respect to when they were bought, in the two right-hand columns. Thus 10 units, or 20.8 per cent of total ownership, were bought in each of the recent periods, whereas two units, or 4.2 per cent, were bought as long as six periods ago. The 48 units can also be analyzed with respect to when they are to be used, and the bottom two lines show that some goods presently on order will not be used, under the circumstances described, until seven periods hence. Each column shows when each item then sold or entering production was bought.

RESPONSE TO CHANGING SALES OR ORDER TERMS

If sales are presently expected to increase, the figures in the first line of the example will be increased, and it may well be that orders for immediate delivery (column 3, line 1) will be increased more. But if the new level of sales is expected to hold, longer-term orders (columns 5 and 7) would also rise. If expectations are realized, and the new level is maintained, other lines would be changed to cover the larger sales expectations, though now the usual *proportions* of orders of each term might be reconstituted. After sufficient time had elapsed for all of the table's lines to alter, the increase in outstandings should be approximately proportionate to the increase in sales (assuming that nothing else affecting procurement had changed). The proportionate relationship is a function of the fact that outstandings associated with delivery periods are largely "process-time stocks" as defined in Chapter 2.[2] However, note that if sales continue to rise (rather than simply to maintain the new level), outstandings will rise less than proportionately to sales unless the continuing increases are *anticipated* in advance orders.

If it is market expectations rather than sales volume that is expected to change, the relative weights of the several order terms are likely to shift. Thus materials covered in column 7 of line 1 might increase—more goods would be placed for delivery five periods hence. This could reflect (1) the unwillingness of suppliers to write orders for shorter terms, (2) purchasers' expectations that prices might rise, and the concomitant wish to fix prices sooner rather than later (3) the purchasers' fear that if one waited to place the usual three-period and one-period orders, the proper schedule of receipts could not be relied upon. This means that the number of units ordinarily purchased for advance delivery would be increased. It might even be that an order of still longer term would be placed —it would appear in the example in a new column 9 to the right of the present table.

However, if only the *relative* distribution of order terms changed, so that the new longer-term orders were placed at the expense of the new shorter-term ones, there would be a deficiency in receipts during the period when the shorter orders would ordinarily have been moving into stock. Since this is undesirable, perhaps the additional long-term orders often constitute an absolute increase in procurement. If so, outstandings would increase immediately and stocks would increase only when these longer-term orders started to reach their delivery dates.

This line of thought bears on the observations of earlier chapters that the lead of outstandings relative to stocks seemed longer than the length of the *average* period that goods remain on order could explain. The reason

[2] They would presumably increase slightly more than proportionately insofar as the need for insurance stocks rises somewhat with the volume of sales.

here suggested is that it is not so much the length of the average delivery period as the period characterizing that fraction of all materials ordered well in advance which is critical. For it is the latter that will determine when an increase in outstandings associated with changing market expectations is likely to affect the size of stocks on hand, other things the same. However, as usual, other things may well not be the same. Particularly, stocks may tend to be drawn down by unexpectedly high requirements for sales or production starts at just the times when heavier long-term orders are placed. If so, this would further contribute to the lead of outstandings relative to stocks. Suggestive evidence on this point appears in the last section of this chapter.

To summarize, four *analytic components* of change in the level of materials outstanding can be identified. Consider their application to an increase (comparable remarks apply to a decrease): (1) Sales plus the desired change in stocks on hand at all stations increase, and orders of each term increase proportionately. (2) The relative weight in all purchases of those of each order term shift in a fashion that increases the average period that goods remain outstanding.

Two other cases which are in a sense special instances of item 2 are worth separating out: (3) The delivery terms for major materials that must be bought ahead lengthen; that is, the terms of the longest-term orders of any consequence become longer than they previously were. (4) The delivery terms on the shortest orders of any consequence become longer than they previously were; that is, "at once" orders for some sorts of materials become in effect orders for two-week or thirty-day delivery.

Number of Months' Supply

Since market prospects are the subject under investigation, it is necessary to focus on those changes in outstandings that are associated with market conditions rather than with the changing levels of sales or production. To do so it is necessary to make some sort of an assumption about the influence of sales if market conditions were unchanging. Moreover, the influence of sales ought to be removed at a *low level* of market prospects—one that characterizes a buyers' market when purchasing is "hand-to-mouth." The assumption that I would like to make first, then, is the one previously made (Tables 33 and 34) in connection with ownership—that the impact of sales is given by a constant outstandings-sales ratio when that ratio is at its cyclical low. As indicated in the previous chapter, this is by no means an ideal solution, but it is less disagreeable in connection with outstandings, which have such a large element of "process-time stock," especially when business is slack, than with stocks on hand or even total ownership. In any event, it is the best that we can do.

DURABLE GOODS MANUFACTURERS

For durables, the trough level of the ratio averaged about .9 for the durable goods group; adjusted for value added in the sales dollar, it comes to about 1.8, or a bit short of eight weeks' supply. Accepting this relation between outstandings and shipment as the level that would be maintained if hand-to-mouth conditions persisted, then, were buying to stay on this basis, the outstandings-shipment ratio would be a horizontal line drawn at the .9 level.[3] If the basic hand-to-mouth level were assumed to conform to the downward trend in the ratio, this norm would be represented by a downward sloping line which was about at the 1.15 level in 1949 and the .75 level in 1962.[4]

[3] Strictly, this statement applies to a ratio dated a bit differently. Outstandings during the current months provide for shipments a sufficient number of weeks hence to allow for the completion of receipt and production. However, since the period shifts, it seems necessary to ignore the matter.

[4] The calculation is not very sensitive to the actual hand-to-mouth level that is picked. The ups and downs in the ratio, and thus the general contours of

Instead, Chart 10 shows, of course, that the ratio is actually a wavy line. We inquire whether the contours of the curve seem to reflect evidence of changing market conditions and if so what more can be learned of the sorts of conditions, sorts of responses, and associated factors.

Chart 10 compares the ratio, top curve, with several series that concern conditions in the metals markets. The second and third curves are based on a remarkable body of information collected by the Chicago Association of Purchasing Agents. It consists of answers to monthly questionnaires sent to two hundred companies, the large majority of which are manufacturers of durable goods.[5] Vendor performance, the second curve on the chart, focuses fairly sharply on the length of time required for materials to be received after they have been ordered. It is a cumulated diffusion index of the number of purchasing agents who report that the delivery period for major commodities is lengthening.[6] Thus it concentrates on what, at least to the buyer, appears to be a supplier-induced impact on his purchasing policy. Suppliers are delivering faster when the curve rises and slower when it falls. It probably focuses on the "analytic component" number 4—a change in the order term of advance deliveries.

The average term of purchase orders, the third curve, presumably combines this supplier-initiated characteristic of delivery periods with levels that might result from the purchasers' decision to buy farther ahead than usual for any one of the many reasons previously mentioned. But the reports doubtless focus on the major materials for which order terms change from time to time.[7] Thus the data probably cover not so much the "analytic component" number 2 as number 4 applied to a wider range of order terms. The terms averaged 2.2 months at peaks and 1.2 at troughs.

Both of these indicators of market conditions have the three and a half movements that characterize the ratio.[8] Table 35 gives measures of correspondence between the ratio and the two indicators of market conditions. For both, the proportion of months in like phase is high—88 months for the level of

non-sales-linked supply, remain unaltered if the hand-to-mouth position is designated as either higher or lower than the eight weeks' supply. Indeed the level might be realistically assumed to have a downward trend. This statement does not apply if the desired minimum is defined as an incremental association between sales and outstandings which differs from the average desired level. If the incremental association is less than the average, the average ratio will tend to decline when sales rise and vice versa.

[5] In 1961, an officer of the association was kind enough to supply the following figures concerning the number of firms in the sample:

Durable goods manufacturers	152
Non-durable or semi-durable goods manufacturers	39
Retailers	9

[6] The questionnaire asked whether deliveries made by vendors are "faster, slower, the same." A diffusion index was computed by adding the percentage reporting slower deliveries and one-half of the percentage reporting that they stayed the same.

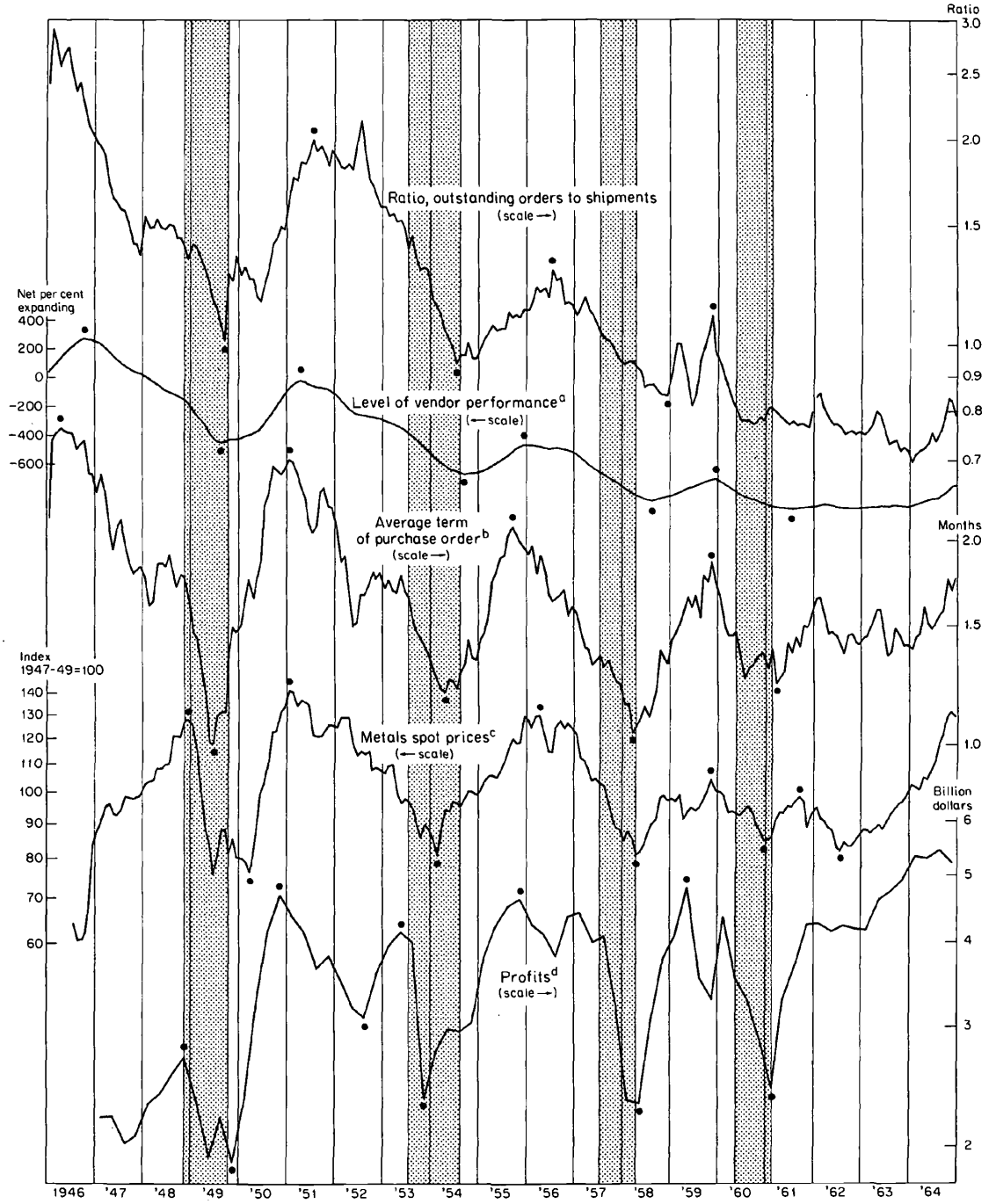
This series, like all diffusion indexes, is roughly similar to a rate of change in data proper. (It differs from a rate of change in that each rise or fall is of identical size.) To glimpse what the data proper might have shown, the diffusion index was cumulated. Thus it portrays whether vendor performance is generally deteriorating (the curve rising) or improving (the curve falling).

[7] The series was constructed in the following way. One question on the Chicago Purchasing Agents questionnaire asks, "How far in advance must you buy in order to have principal materials on hand when needed: 0 to 30 days, 30 to 60 days, 60 to 90 days, 90 days or longer?" We constructed the index by using the percentage reporting each of the four delivery terms as weights for the average term included in the category. The average term was taken in the center of each 30 day period. Thus, 0 to 30 days was considered 15 days, or .5. The index, in other words, is a weighted-average delivery period in terms of months of supply.

[8] I refer to the movements terminating in 1949, for which the downward phase only is shown, the next two complete cycles, plus the movement starting in the beginning of 1959. Though outstandings recede in 1960 from the levels stimulated, at least in part, by the steel strike, the downward trend in the ratio and the ambiguity resulting from the shift in the statistical series mean that no terminal trough could be marked. Apparently the rise in outstandings at that time (see Chart 1) is not sufficiently greater, proportionately, than that of shipments to be clearly identified as a cycle in the ratio.

CHART 10

Ratio of Outstanding Materials Orders to Shipments Compared with Selected Series, Durable Goods Manufacturers, 1946–64



Note: Shaded areas represent business contractions. Specific cycle turns are marked by dots. [a] Cumulated diffusion index, Chicago Purchasing Agents Association data. [b] Based on CPAA data, see text. [c] Index of spot-market prices of five metals. [d] Corporate profits before taxes, durable goods manufacturers, FTC, SEC data.

TABLE 35

Timing: Ratio of Outstandings Materials Orders to Shipments and Selected Data, Durable Goods Manufacturers, 1946–61

Line	Reference Series[c]	Section A: Months Lead (-) or Lag (+) for Matched Turns[a] Chronology[b] P (1/47)	T (7/47)	P 11/48	T 10/49	P (2/51)	T (6/52)	P 7/53	T 8/54	P 7/57	T 4/58	P 5/60	T 2/61
	Specific Series: Ratio of Materials Outstandings to Shipments, Durables												
1	Business cycles			⊕	-1			-24	-1	-12	+8	-6	⊕
2	Subcycles	⊕	⊕	⊕	-1	+5	⊕	⊕	-1	-12	+8	-6	⊕
	Specific Series: Level of Vendor Performance												
3	Business cycles			-25	-2			-27	+1	-19	+4	-5	+5
4	Subcycles	-3	⊕	⊕	-2	+2	⊕	⊕	+1	-19	+4	-5	+5
5	R: materials outstanding to shipments, dur.	☒	⊙	⊙	-1	-3	⊙	⊙	+2	-7	-4	+1	☒
	Specific Series: Average Term of Purchase Orders												
6	Business cycles			-31	-4			-30	-4	-22	-1	-5	+1
7	Subcycles	-9	⊕	⊕	-4	-1	⊕	⊕	-4	-22	-1	-5	+1
8	R: materials outstanding to shipments, dur.	☒	⊙	⊙	-3	-6	⊙	⊙	-3	-10	-9	+1	☒
	Specific Series: Metals, Spot Prices												
9	Business cycles			+1	+5			-30	-6	-15	0	-6	-2
10	Subcycles	⊕	-10	+1	+5	-1	⊕	⊕	-6	-15	0	-6	-2
11	R: materials outstanding to shipments dur.	⊙	☒	☒	+6	-6	⊙	⊙	-5	-3	-8	0	-3
12	Average term of purchase orders	⊕	☒	+32[r]	+9	0	⊙	⊙	-2	+7	+1	-1	-3
	Specific Series: Corporate Profits												
13	Business cycles			0	-5			-2	-9	-20	+1	-12	0
14	Subcycles	⊕	⊕	0	-5	-3	+2	-2	-9	-20	+1	-12	0
15	R: materials outstanding to shipments, dur	⊙	⊙	☒	-4	-8	☒	☒	-8	-8	-7	-6	☒
16	Average term of purchase orders	⊕	⊙	+31[r]	-1	-2	☒	☒	-5	+2	+2	-7	-1

(continued)

TABLE 35 (concluded)

Line	Reference Series[c]	Section B: Average Timing of Turns — Number Matched (- + 0)	Median[e] P	Median[e] T	Median[e] All	Average Deviation[f] P	Average Deviation[f] T	Average Deviation[f] All Turns Wt'd	Section C: Percentage of Months in Like Phase[d] — Timing Adjustment[g]	% Mos. 7/46–12/61	% Mos. 1/48–12/61
	Specific Series: Ratio of Materials Outstandings to Shipments, Durables										
1	Business cycles	5 1 0	-14.0	+2.0	-3.5	6.7	4.0	8.0 5.3	0	51	57
2	Subcycles	4 2 0	-4.3	+2.0	-1.0	6.2	4.0	5.2 5.1	0	63	60
	Specific Series: Level of Vendor Performance										
3	Business cycles	5 3 0	-22.0	+2.5	-3.5	7.0	2.5	10.5 4.8	-3,-4,-5	55	56
4	Subcycles	4 4 0	-4.0	+2.5	-0.5	5.8	2.5	5.1 4.1	0	62	62
5	R: materials outstanding to shipments, dur.	4 2 0	-3.0	-1.0	-2.0	2.7	2.0	2.7 2.3	-1,-2,-3	88	89
	Specific Series: Average Term of Purchase Orders										
6	Business cycles	7 1 0	-26.0	-2.5	-4.5	8.5	2.0	10.0 6.0	-4,-5	57	63
7	Subcycles	7 1 0	-7.0	-2.5	-4.0	6.2	2.0	4.4 4.1	-4	66	68
8	R: materials outstanding to shipments, dur.	5 1 0	-5.0	-5.0	-4.5	4.0	2.7	3.3 3.3	-3,-4,-5	87	86
	Specific Series: Metals, Spot Prices										
9	Business cycles	5 2 1	-10.5	-1.0	-4.0	10.0	3.2	7.6 6.5	-3,-4		64
10	Subcycles	6 2 1	-3.5	-2.7	-3.0	5.1	4.3	4.8 4.7	-3,-4		70
11	R: materials outstanding to shipments, dur.	5 1 1	-3.0	-4.0	-3.7	2.0	4.0	3.2 3.1	-3		74[h]
12	Average term of purchase orders	3 4 1	+3.5	-0.5	+0.5	10.0	3.8	6.9 6.9	0, +1	69	77[h]
	Specific Series: Corporate Profits										
13	Business cycles	5 1 2	-7.0	-2.5	-3.5	7.5	3.8	5.6 5.6	-6		60
14	Subcycles	6 2 2	-5.7	-1.3	-2.5	6.5	3.7	5.0 4.1	-6		66
15	R: materials outstanding to shipments, dur.	6 0 0	-7.3	-6.3	-7.5	0.9	1.5	1.2 1.2	-7,-8		83[h]
16	Average term of purchase orders	5 3 0	0	-1.0	-1.0	10.5	1.8	6.1 6.1	-1	70	77

Notes to Table 35

[a]Specific series are matched with the indicated reference series (see note c) in accordance with the standard NBER rules. A double relaxation of rules is marked r; it applies to cases for well-conforming series in which two like turns are matched, though an unlike turn lies between them. The figure is underlined when subcycle chronology is the reference series, a minor cycle in the specific series has entered a comparison; or, when two individual series are compared, a minor cycle in either series has entered a comparison. When the business cycle chronology provides the reference, minor specific cycle turns are ignored. The meaning of other symbols is:

⊕ turn in the reference series does not appear in the specific series.

☊ turn in the specific series does not appear in the reference series.

⊙ there is no turn in either series in the neighborhood of the chronology date.

[b]Chronology dates are business cycle reference dates. In addition, four minor subcycle dates, enclosed in parentheses, are added to form a subcycle chronology.

[c]Reference series are of three sorts: (1) the business cycle chronology as shown in column heads, excluding the dates in parentheses; (2) the subcycle chronology as shown in all column heads; (3) particular series whose specific cycles and minor cycles constitute the reference dates for the comparison.

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

[e]Median is the average timing of the center two or three turns.

[f]Average deviation from the median. The "weighted" (wt'd) average is the deviation from the median for peaks and for troughs separately, weighted by the number of turns.

[g]In determining months in like phase a timing adjustment is made which maximizes confluence. Before counting the months in phase, the specific series is in effect moved to the right to allow for a lead and to the left to allow for a lag if by so doing the percentage of months in like phase (as rounded) is increased. If the months in phase are as large or larger without an adjustment, this is indicated by a "timing adjustment" of 0.

In some cases we wish to know the percentage of months in phase on a synchronous basis, regardless of whether the percentage in phase is thereby maximized. If so, the "timing adjustment" is given as "none."

[h]For the period 1/49–12/61, the percentage of months during which line 11 was in phase was 80 per cent; line 12, 83 per cent; and line 15, 89 per cent.

vendor performance and 87 months for the order term.[9]

Outstandings continue to rise not only absolutely but relative to sales (the ratio rises) for about a quarter of a year after these two indicators of market conditions, particularly the second, indicate some slackening in market tension. Analogously, at recessions, producers continue to decrease the volume of goods on hand and on order, both absolutely and relatively to sales, for a number of months after more purchasing agents report improved than report worsened performance. One can find several reasons for the lag, but they are all too problematical to propose as an explanation.[10]

[9] Again, the implications of the actual percentage of months in phase need to be evaluated in terms of the number of movements and the correspondence of both series to general business conditions. The first criterion would in this case discount the significance of the comparisons since the number of movements is small. The second would increase it since all three series have a very poor conformity to business cycles or subcycles (see the first two lines for each of the three measures in Table 35). As a result, any relation of the series to one another is not likely to be produced by their common relation to major business conditions.

[10] I think of the following possibilities. Purchasers may request postponement of deliveries at peaks and a hastening of them at troughs. The cessation of an increase in the longest delivery terms to which the CPA data relate does not necessarily, as explained in the previous section, mean that total outstandings will decrease, since an increase in orders of intermediate term can accompany and perhaps persist longer than the increasing terms of the longest of advanced orders;

The average order term also clearly exhibits the motif of early thrust previously noted in the materials-purchasing segment of the economy. From the time that order terms began to expand to when their expansion reached its maximum was 19, 17, and 20 months respectively in the three major postwar cycles. The increase appears to be continuous and steady during the rise, and likewise during the period of fall (though not quite as consistently so). The time series has an unusually triangular pattern.

Triangular patterns appear also in the outstandings-shipment ratio and elsewhere in market-oriented data. Time series do not as a rule rise or fall at a uniform rate right up to the time when they reverse their direction. Change ordinarily slows down before it reverses. The retardations, say at peaks, express either reduced participation of firms in the predominant pattern of change, or reduced amount of change by each participant, or both. The failure of data that focus on market expectation to exhibit the usual amounts of this reasonable behavior presents a puzzle which needs to be unraveled. The last chapter offers an explanation.

I conclude that the purchasing-agent data suggest that market extension is associated in part with the lengthening of delivery periods by suppliers, and that buyers, whether for this reason or others, purchase at least certain principal materials farther ahead than before.

Is it possible to find hints in these time series of motives for market extension other than that of the changed delivery periods which suppliers offer?

An expected rise in price would, as we have noted, provide one reason, and expectations may bear some relation to the actual spot-market price of metals.[11] After 1948, when most of the recovery from war-time controls had doubtless been completed, prices seemed to bear a general family resemblance to the other market-oriented series. However, their measured correspondence to the ratio (Table 35, line 11) even beginning in 1949 shows just 80 per cent of the months in phase with the outstandings ratio. It is interesting to note for later reference that prices tend to lead the outstandings ratio. This is hard to explain in terms of expected prices, which should, according to the logic presented early in the chapter, lag, since first differences, not the data proper, should correspond with the level of outstandings.

The risk involved in extending market positions is due in part to the possibility of buying at the wrong price. But it is also due in part to the possibility of buying an article that will not be needed within a reasonable time, or even at all. This second risk is virtually eliminated if materials are bought for use in connection with finished product for which firm sales orders have been written. If so, outstandings might be larger if backlogs of sales orders were larger, other things the same. However the volume of unfilled orders for machinery and transportation equipment (consult Chart 1) appears to have little or no relation to the data under examination, nor does its conversion to months of sales alter this fact. However, as we shall see in a moment, unfilled sales orders do have a different sort of association with these data.

The bottom line of Chart 10 shows profits before taxes for corporations in the durable goods industries.[12] There appears to be a provocative similarity between profits and the rest of the events that have been described. But profits lead the outstandings-shipment

an analogous logic might apply to troughs. Unexpected change in sales may also play a part.

[11] The following commodities are included: lead, copper, scrap, steel ("heavy" and "Pittsburgh"), zinc, tin.

[12] Corporate profits before taxes, durable goods manufacturers, as computed in the Federal Trade Commission–Securities and Exchange Commission Series covering twelve durable goods industries. This series replaces one compiled at the National Bureau by Thor Hultgren which was used for all of our calculations. Turns are identical except that the trough in 1949 was in May rather than in November. Timing comparisons are based on the former date rather than on that of the series as charted.

ratio by at least six months; in this they join and exceed most of the other series that we have been examining. The lead is regular; the average deviation is only 1.2 months for the six turns that are matched. Beginning in 1949, 89 per cent of the months are in like phase after allowing for a lead of orders of some seven or eight months (line 15). If this visual similarity implies any causal relationship, it is doubtless of a complex sort. Stocks of materials on order and on hand rise in response in part to an additional volume of sales, and higher volume ordinarily means higher profits, too.

It may be that the volume of profits has some direct bearing on the willingness of a businessman to support the financing costs of inventories on hand, and the obligation implied in those on order. I hinted at the argument in Chapter 2: retained profits constitute a source of funds and some portions of these funds must be kept liquid against the demise of good times. Would not investment in inventories provide this liquidity, whereas investment in fixed capital would not? If so, the actual opportunity cost of financing the additional stock is not the standard earnings rate that all investment, including investment in inventories, is likely to be required to meet; this figure may be 15 to 25 per cent in the heavy industries. Instead, it is the opportunity cost of liquid funds, as set by the earnings rate of assets such as commercial paper or government bonds. Management rules do not discuss such matters, but it may nevertheless get around that the front office is willing to overlook inventory investment which is high by the usual standards.

DEPARTMENT STORES

For department stores, there is little pertinent information on market conditions with which to compare the ratio of outstanding orders to sales. Nevertheless, Chart 11 displays some relevant data and Table 36 gives matching measurements.

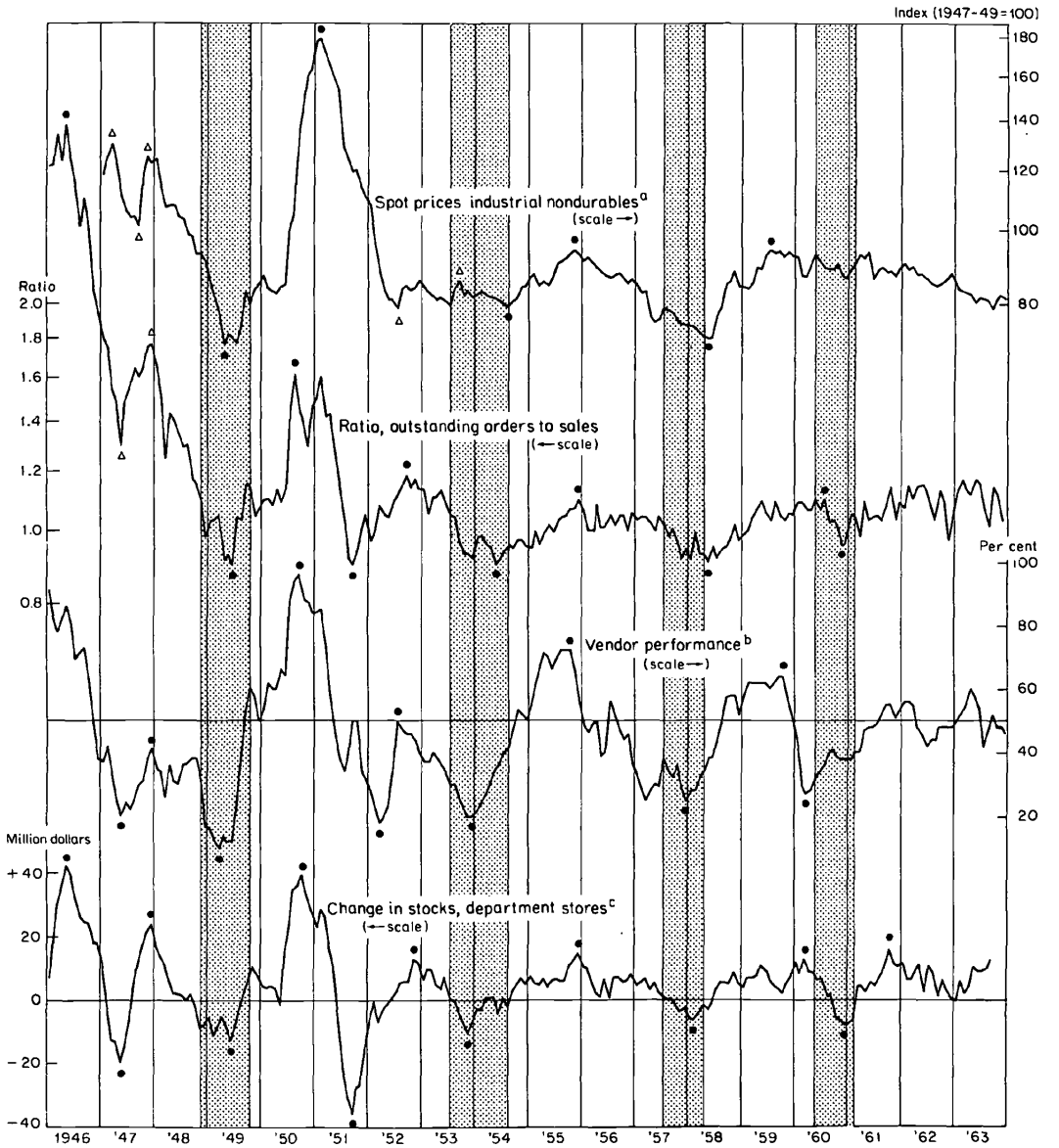
For one thing, the ratio has a persistent lead relative to the business cycle or subcycle chronology. At peaks it averages nine months; at troughs three, and four of the six trough comparisons are leads of between two and four months (Table 36, line 2). Thus the department store ratio moves earlier than for the durable goods industry (line 8) and very systematically so. This may reflect the tendency for consumer buying to move early in the postwar years. But there is, of course, no reason why changes in market expectations, if indeed this is what the ratios reflect, should have identical patterns in markets as diverse as those for materials for durable goods industries on the one hand and for finished goods sold by department stores on the other. In any event, there are interesting similarities and differences between the outstandings-sales ratio for the two sets of enterprises.

Of particular interest is what they suggest about the periods of thrust that we have observed in other contexts. For durable goods, termination of these thrusts marks the beginning of a downturn that continues throughout the rest of expansion. For department stores a relatively level period (1959) or a fall followed by a subsequent rise (1947 and 1951) may follow after the first strong upward rise at the start of cyclical expansion. The extra movements correspond to those found in many economic series in 1947 and after the Korean boom. It is interesting, incidentally, that the business expansion starting in early 1961 was accompanied by increases in the number of months' sales covered by outstanding orders for department stores; whereas for durables, the increase in outstandings (which, note, did take place at exactly the same time—December 1960) was less than proportional to the rise in sales, so that the ratio continued to fall off.

Table 37 develops further characteristics of the ratios at the time of rapid expansion. If, for the sake of argument, we read the strong rises in outstandings-sales or shipment ratios as an indicator of increasing tensions in the relevant materials markets, the figures picture

CHART 11

Ratio of Outstanding Orders to Sales of Department Stores, Compared with Selected Series, 1946–63



Note: Shaded areas represent business contractions. Specific cycle turns are marked by dots, additional minor turns by triangles.

[a] Index of spot prices of nine semidurable industrial commodities.

[b] Diffusion Index, Chicago Purchasing Agents Association.

[c] Five-month centered average of month-to-month change.

TABLE 36

Timing: Ratio of Outstanding Orders to Sales and Selected Data, Department Stores, 1946–61

Line	Reference Series[c]	Section A: Months Lead (-) or Lag (+) for Matched Turns[a] Chronology[b] P (1/47)	T (7/47)	P 11/48	T 10/49	P (2/51)	T (6/52)	P 7/53	T 8/54	P 7/57	T 4/58	P 5/60	T 2/61
	Specific Series: Ratio of Outstanding Orders to Sales												
1	Business cycles			-11	-4			-10	-3	-19	+1	+2	-3
2	Subcycles	-8	-2	-11	-4	-6	-9	-10	-3	-19	+1	+2	-3
3	Spot prices, semidurables	-10	-2	+1	+2	-6	-10	-12	-3	+1	0	+12	☒
4	Level of vendor performance,	-5	☒	☒	-2	-8	☒	☒	-4	0	-3	+7	-8
5	Average term of purchase orders	+1	☒	☒	0	-5	☒	☒	+1	+3	+2	+7	-4
6	D. I. vendor performance[i]	☒	0	0	+3	-1	-6	+2	+5	+2	+5	+9	+8
7	Change stocks dept. stores	-1	0	0	0	-2	0	-2	+6	0	+3	+4	-1
8	R: Materials outstanding to shipments, dur.	⊕	⊕	⊕	-3	-11	⊕	⊕	-2	-7	-7	-8	⊕
	Specific Series: Change in Stocks												
9	Spot prices, semidurables	-10	-2	+1	+2	-4	-10	-10	-9	+1	-3	+5	☒
10	Level of vendor performance,	-5	☒	☒	-2	-6	☒	☒	-10	0	-6	+3	-7
11	Average term of purchase orders,	+1	☒	☒	0	-3	☒	☒	-5	+3	-1	+3	-3
12	D. I. vendor performance[i]	☒	0	0	+3	+1	-6	+4	-1	+2	+2	+5	+9

(continued)

TABLE 36 (concluded)

Line	Reference Series[c]	Section B: Average Timing of Turns										Section C: Percentage of Months in Like Phase[d]	
		Number Matched			Median[e]			Average Deviation[f]				Timing Adjustment[g]	% Mos. 7/46–12/61
										All Turns			
		−	+	0	P	T	All	P	T		Wt'd		
	Specific Series: Ratio of Outstanding Orders to Sales												
1	Business cycles	6	2	0	−10.5	−3.0	−3.5	5.5	1.2	5.1	3.4	−3, −4	65
2	Subcycles	10	2	0	−9.0	−3.0	−5.0	4.7	2.0	4.5	3.3	−5	71
3	Spot prices, semidurables	6	4	1	−2.5	−1.7	−1.7	7.0	3.1	5.2	5.2	−2, −3	64[h]
4	Level of vendor performance,	6	1	1	−2.5	−3.5	−3.5	5.0	1.8	3.4	3.4	−3, −4	75
5	Average term of purchase orders,	2	5	1	+2.0	+0.5	+1.3	3.5	1.8	2.7	2.6	+1	79
6	D. I. vendor performance[i]	2	7	2	+1.7	+4.0	+2.3	2.5	3.5	3.2	3.0	+2	81
7	Change stocks dept. stores	4	3	5	−0.5	0	0	1.5	1.7	1.6	1.6	0	90
8	R: materials outstanding to shipments, dur.	6	0	0	−8.7	−4.0	−7.0	1.5	2.0	2.3	1.8	−7	79
	Specific Series: Change in Stocks												
9	Spot prices, semidurables	7	4	0	−1.5	−4.7	−3.0	5.2	4.1	4.5	4.7	−3	66[h]
10	Level of vendor performance,	6	1	1	−2.5	−6.5	−5.5	3.5	2.2	3.1	2.9	−5, −6	75
11	Average term of purchase orders,	4	3	1	+2.0	−2.0	−0.5	2.0	1.8	2.4	1.9	0, −1	79
12	D. I. vendor performance[i]	2	7	2	+2.3	+1.0	+1.7	1.6	3.5	2.7	2.7	+2	84

For notes a through g, see Table 35.

[h]Spot prices of semidurables were compared with each of the specific series for the time period 1/47–12/61.

[i]D. I. signifies diffusion index. For description see text footnote 6, above.

TABLE 37

Comparison of Timing and Duration for Periods of Thrust in Outstandings-Sales Ratio, Department Stores and Durable Goods Manufacturers, 1946-65

Dates for Department Store Ratio		Timing: Durables Compared with Department Stores		Duration of Period	
Trough[a]	End of Thrust[b]	Trough[a] (1)	End of Thrust[b] (2)	Department Stores (3)	Durables (4)
5/47	12/47	unmatched		7	--
6/49	8/50	+3	+11	12	22
9/51	9/52	unmatched		12	—
5/54	12/55	+2	+7	19	24
5/58	5/59	+7	+6	12	11
11/60	5/62	unmatched	--	18	--
Average		+4.0	+8.0	13.3	19.0

Note: Ratio of outstanding orders to sales for department stores and ratio of outstanding materials orders to shipments for all durable goods manufacturers.

[a]Troughs are the specific cycle or subcycle trough dates.

[b]The termination date for department stores is the point at which the first continuous rise ceases or reverses; this is the date marked as the specific cycle or subcycle peak except for the last two movements. For durables it is in each case the specific cycle peak date.

a shingled overlay in the two markets. Suppliers of department stores feel the start of extension first—four months earlier on the average. (The last line shows that troughs in durables lag those in department stores by four months on the average.) But for suppliers of durable goods manufacturers extension persists longer (the peaks of the thrusts are eight months later on the average than those of department stores). Suppliers of department stores experience it more often—several episodes are unmatched. But the rises after major cyclical troughs, the movements shared by the two industries, can be of longer total duration in the durable goods than in the consumer supply fields (compare columns 3 and 4). It is interesting in this connection to remember that the percentage amplitude of rise during their expansion phases was virtually the same for the two ratios—peak standings on the average were 152 per cent of trough standings for durables and 144 per cent for department stores. But of course, since the number of months' supply on order was far larger for durables, the absolute increase, in terms of weeks' supply, was also larger—over twice the size.[13] This is probably the more significant fact from the point of view of the market developments that are implied.

What the ratio suggests about market extension for department stores ought to be compared with information about the appropriate markets themselves, but unfortunately none seems readily available. A sensitive price index does not apply directly to finished consumer goods, but might have some indirect value as a reflection of tensions in those markets. The

[13] See Tables 7 and 16. The average week's supply on order for durable goods industries at troughs and peaks respectively was 8.2 and 12.5, an increase of 4.3 weeks during expansion. For department stores, the corresponding figures were 4.0, 5.7, and 1.7.

top line in Chart 11 is spot-market prices for nondurable industrial commodities, which, of course, are a poor representation of even the raw materials used in department store merchandise.[14] Perhaps all that can be said of this series is that it resembles retailers' advance buying more than would the metals price index of the previous chart. Nevertheless, though all turns are matched, the timing is very irregular and a very low percentage of months are in like phase (Table 36, line 3).

Firms reporting to the Chicago Purchasing Agents are chiefly manufacturers of durable goods. Nevertheless comparisons with the department store data are of interest. Indeed, line 4 of Table 36 shows that outstanding orders of department stores lead the level of vendor performance as the other timing figures imply, but correspondence is low. With the average term of purchase orders (line 5), its correspondence is a bit better, allowing for a lag of one month. But a somewhat closer association is evident with respect to the information that records not the level of vendor performance but its rate of change—the percentage of agents reporting that vendors' deliveries are deteriorating. This series, like virtually all first difference series, leads the level of performance. Eleven turns are matched and 81 per cent of months are in like phase after allowing for a two-month lag of the department store ratio. In Chart 11 (compare curves 2 and 3) the eye seems to support this measure of parallelism.

In view of the central need to have items on hand when customers may want them, part of retailers' defense against tightening markets is likely to be an effort to get goods delivered at once. The very high degree of correspondence (90 per cent of months are in like phase on a synchronous basis) of the outstandings ratio and the rate of change in stocks on hand, curve 4 of the chart (Table 36, line 7), could reflect this type of influence. It might also be reflected in the close association of inventory investment with the rate of deterioration or improvement in vendor performance a month or so earlier (line 12). Eighty-four per cent of months are in like phase; eleven turns are matched, six of which are within two months of one another. At peaks the average deviation is only 1.6 months for the five comparisons.

In general there is little of consequence to go on, but the scraps that are available certainly do not deny the presence of market-directed considerations in retailers' buying. Also, market extension, as defined by the outstandings-sales ratio, occurs more often and typically a bit earlier than in the durable goods market. It has an exceedingly close counterpart in rates of change in stocks on hand.

Rates of Change in Outstandings

Rates of change are capable of enriching the meager information previously reviewed. For one thing, there are some additional series that can be introduced in this form. For another, comparisons of rates of change further specify information about correspondence yielded by data proper. Finally, and most important, it is possible that part of the process whereby a buying wave rises and falls operates through the impact of rates of change on the sensory apparatus of the market. Also, if adjustment to change in buying is sticky, high rates of change may occasion more response than low ones, other things the same; this line of thought finds application in the last chapter.

Once again, the most likely spot at which to see the reaction of buying to market conditions is in outstandings and rates of change in outstandings are particularly sensitive to market conditions. If more and more buyers fear that more suppliers will deliver more slowly or raise prices in one form or another, they will tend to place their orders for more goods farther ahead. In the aggregate buying is then likely to increase at an increasing rate.

In examining changes in outstandings it is

[14] The commodities included are burlap, cotton, hides, print cloth, rubber, tallow, wool tops, rosin.

just as well to include the response to changes in sales rather than to try to remove it by using ratios. It is clear by now that the sales influence is only one part of a complex picture, yet, since it may interact with the rest (and the next chapter shows that it does), it is better to include it than to take it out along with perhaps some other interaction effect.

Chart 12 displays an impressive parallelism between the rate at which outstanding orders for materials increase or decrease and the number of vendors that are reported to be making slower or faster deliveries. The two series share all the same movements and even the relative severity of each seems quite similar. The measures in Table 38, line 1, indicate that 82 per cent of the months are in like phase on a synchronous basis. There are eleven matched terms, eight of which are within two months of one another. Rates of change then support the other evidence suggesting that market extension takes place partly because suppliers require a longer time to make deliveries on at least some essential materials. However, the indication that this aspect tended to lead, which seemed implicit in the lead of the cumulative vendor performance index relative to the outstandings-shipments ratio, is weakened or rather qualified by the fact that, converted to rates of change, the association is not clearly different from synchronous. This is doubtless just another instance of how two phenomena can accelerate or decelerate at the same time, although the one does not actually reverse as swiftly as the other.

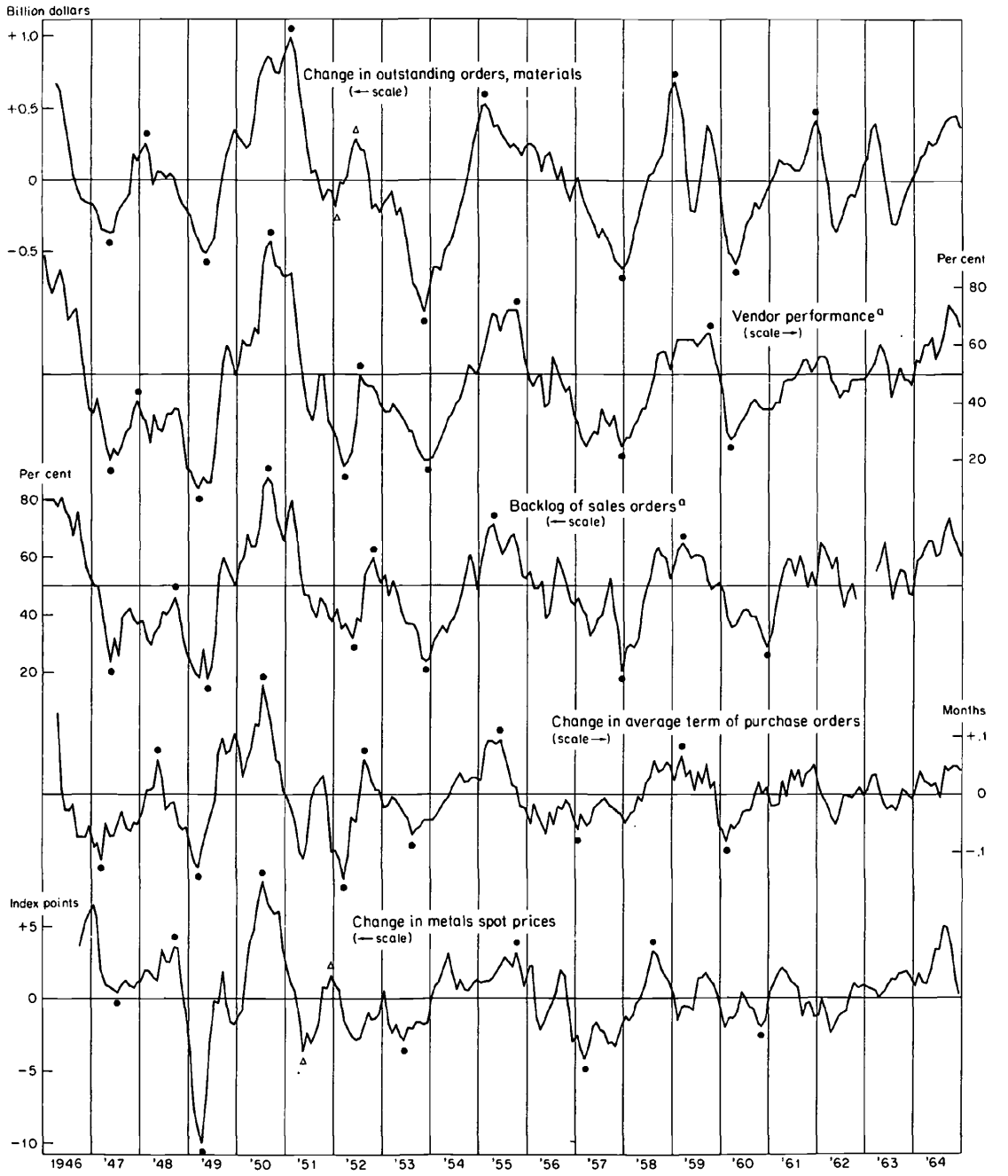
The association of outstandings and metals prices is deteriorated by differencing. This is caused at least in part by technical characteristics of the price series which may or may not have economic meaning: the data proper are unusually triangular in shape; therefore their first differences do not have the usual wavelike pattern, and selection of peaks and troughs is difficult and perhaps not meaningful. However, on the average, changes in outstandings are about synchronous with changes in prices. Thus, for whatever it is worth, these figures do not contradict the observation based on the data proper that timing association was not consistent with a causal link running from actual prices to expected prices to market expansion or contraction. This link would imply that prices lead because it is the rates of change in price and outstandings *proper* which would tend to be synchronous (or here second differences in prices and first differences in outstandings). The logic of this association was discussed at the start of the chapter.

The presence or absence of a backlog of sales orders can affect the risk cost of advance purchase of the materials required for the fabrication of the orders. Indeed, if a firm must write orders for future delivery at a predetermined price, it may be risky *not* to fix materials price (by immediate purchase) at the cost figured into the sales contract. Is there evidence that "backorders" affect the volumes of materials buying? The question may be examined by means of a series collected by the Purchasing Agents. Companies report whether the backlogs of the products the company sells are increasing or decreasing. This information for the same companies can be compared with the average term of purchase orders, the closest that the Purchasing Agents data come to changes in outstanding orders for materials. Eighty-six per cent of the months are in like phase (Table 38, line 8); of the eleven matched terms, seven are within two months of one another. However, it is interesting to find that changes in sales backlogs lag rather than lead changes in the average term of outstanding orders for materials (there is only one lead); the average lag is two months.

Further and somewhat conflicting evidence on the impact of unfilled sales orders of the machinery and transportation equipment industries with those of the materials-producing industries—hypothetically the outstanding materials orders of the first group (though with

CHART 12

Changes in Outstanding Orders for Materials and Information on Market Conditions, 1946–64



[a] Diffusion Index based on Chicago Purchasing Agents Association data.

TABLE 38

Timing: Changes in Outstanding Materials Orders and Selected Market Data, Durable Goods Manufacturers, 1946–61

Line	Reference Series[c]	Section A: Months Lead (-) or Lag (+) for Matched Turns[a] Chronology[b]											
		P 1947	T 1947	P 1948	T 1949	P 1951	T 1952	P 1953	T 1954	P 1957	T 1958	P 1960	T 1961
	Specific Series: Change in Outstanding Orders, Materials												
1	D. I. vendor performance	⊙	0	+2	+2	+5	-2	-1	-1	-8	0	-9	+1
2	Change average term of purchase orders	⊙	+2	-3	+2	+7	-2	-2	+3	-4	+11	-2	+2
3	Change spot prices, metals	⊙	-2	-7	+1	+7	+8	+6	+5	-8	+9	-1	-7
4	Spot prices, metals	⊙	+8	-10	-10	+1	☊	☊	-3	-14	-4	-10	-8
5	Change unfilled orders, final product	⊕	☊	☊	+2	-1	☊	☊	+1	-9	+4	-4	-8
6	D. I. backlog sales orders	⊙	0	-7	0	+6	-4	-4	0	-2	0	-2	-8
7	Corporate profits	⊙	☊	-9	0	+3	-7[r]	-11[r]	0	-9	-5	-4	-10
	Specific Series: Change in Average Term of Purchase Orders												
8	D. I. backlog sales orders	⊙	-2	-4	-2	-1	-2	-2	-3	+2	-11	0	-10
	Specific Series: D. I. Vendor Performance												
9	D. I. backlog sales orders	⊙	0	-9	-2	+1	-2	-3	+1	+6	0	+7	-9
10	D. I. production	⊕	☊	-11[r]	+2	-1	+4	+3	0	-6	0	-8	+10
	Specific Series: Ratio Materials Outstanding to Shipments												
11	Change unfilled orders, final product	⊕	⊙	⊙	+6	+4	⊙	⊙	+9	+8	+16	+6	⊕
	Specific Series: Average Term of Purchase Orders												
12	Change unfilled orders, final product	-2	⊙	⊙	+3	-2	⊙	⊙	+6	-2	+7	+7	+3
13	D. I. backlog sales orders	☊	⊕	⊕	+1	+5	⊕	⊕	+5	+5	+3	+9	+3
	Specific Series: D. I. Backlog Sales Orders												
14	Change unfilled orders, final product	⊕	☊	☊	+2	-7	☊	☊	+1	-7	+4	-2	0

(continued)

TABLE 38 (concluded)

Line	Reference Series[c]	Section B: Average Timing of Turns — Number Matched (− + 0)	Median[e] P	Median[e] T	Median[e] All	Average Deviation[f] P	Average Deviation[f] T	Average Deviation[f] All Turns Wt'd	Section C: Percentage of Months in Like Phase[d] — Timing Adjustment[g]	% Mos. 7/46–12/61
	Specific Series: Change in Outstanding Orders, Materials									
1	D. I. vendor performance[h]	5 4 2	-2.3	0	-0.3	5.1	1.0	2.8	0, -1	82
2	Change average term of purchase orders	5 6 0	-2.3	+2.0	+0.7	2.5	2.3	3.6	0, +2	79
3	Change spot prices, metals[i]	5 6 0	-0.7	+3.0	+1.7	5.6	5.0	5.5	+1	68
4	Spot prices, metals[i]	7 2 0	-10.0	-5.0	-7.3	3.8	6.6	5.2	-8	77
5	Change unfilled orders, final product	4 3 0	-4.7	+1.5	-1.3	2.9	3.2	4.0	-1, 0	77
6	D. I. backlog sales orders[h]	6 1 4	-2.7	0	-1.3	2.7	2.0	2.9	-1, -2	83
7	Corporate profits	7 1 2	-7.3	-4.0	-6.0	4.1	3.6	4.0	-5, -6, -7	77
	Specific Series: Change in Average Term of Purchase Orders									
8	D. I. backlog sales orders[h]	9 1 1	-1.0	-2.5	-2.0	1.8	3.0	2.5	-2	86
	Specific Series: D. I. Vendor Performance[h]									
9	D. I. backlog sales orders[h]	5 4 2	+1.3	-1.0	-0.7	5.1	2.3	3.7	0	79
10	D. I. production[h]	4 4 2	-5.0	+2.0	0	4.4	2.8	4.5	0	70
	Specific Series: Ratio Materials Outstanding to Shipments									
11	Change unfilled orders, final product	0 6 0	+6.0	+10.3	+7.0	1.3	3.8	2.8	+6, +7, +8	84
	Specific Series: Average Term of Purchase Orders									
12	Change unfilled orders, final product	3 5 0	-2.0	+4.5	+3.0	2.2	1.8	3.2	+3	89
13	D. I. backlog sales orders[h]	0 7 0	+6.3	+3.0	+4.3	1.8	1.0	1.8	+4, +5	82
	Specific Series: D. I. Backlog Sales Orders[h]									
14	Change unfilled orders, final product	3 3 1	-5.3	+1.5	-0.3	2.2	1.2	3.3	0, -1	76

Notes to Table 38

NOTE: For notes a, d, e, f, see Table 35.

[b]Chronology dates are years when business cycle turns occur. They indicate the sequence and approximate time when the specific turns occur for which timing comparisons are given.

[c]Reference series are the series whose specific cycles plus minor cycles constitute the reference dates with which matching cycles in the specific series are compared.

[h]D. I. signifies "Diffusion Index".

[i]Change in and level of spot prices of metals were compared with the change in outstanding orders materials for the time period 1/49–12/61.

serious impurities previously discussed). We have already noted that the data proper are poorly associated. Nor do the rates of change display an interesting confluence. Table 38, line 5, shows 77 per cent of the months in like phase on a synchronous basis: only seven turns are matched, and leads and lags are equally common. In Chart 6, where the two series were plotted, we saw that changes in backlogs do not have extra movements in 1947 and 1952; beginning in 1959 they had virtually no movements at all. This last characteristic brings to mind the ratio of outstanding materials orders to shipments, and further examination does indeed suggest other similarities. The rate at which back orders for final products built up or declined rose or fell on the average at least six months or more before the matched fluctuations in the ratio. Allowing for this lag, 84 per cent of the months were in like phase (Table 38, line 11).

All in all, the evidence bearing on the impact of backlogs of sales orders on materials buying is frustrating. For one thing the CPA data, which are highly pertinent, since they concern sales and purchase orders for the same companies, show close correspondence in, in effect, rates of change in the two sorts of unfilled orders; those for materials moved a bit sooner. The census data show an association between the level of purchase orders outstanding, expressed in terms of months of sales and the rate of change in sales orders of the heavy industries a good half a year earlier. The difference may conceivably be the result of the difference in the sorts of firms covered in the two sets of information; if so, this has some economic meaning. But the possibility cannot be ruled out that difference results from technical characteristics of the CPA data.[15]

But I do not want to overemphasize the ambiguities of the evidence. The predominant impression is that of similarity. The empirical materials certainly are not inconsistent with the notion that a manufacturer is more likely to buy more materials farther ahead than usual at a time when backlogs for his own product are large, or that he is likely to return to a hand-to-mouth position when his customers are getting prompt deliveries.

[15] Concerning the problem of composition of the two sets of data, the CPA companies that report backlogs of sales orders are certainly not all members of the machinery and transportation equipment industries. Indeed, the proportion that are in some intermediate type of manufacture may well be large. For these, sales orders would be covered only as materials orders in the census data. This explanation seems consistent with the fact that when the two sets of statistics on change in unfilled sales orders are compared, the census series lags the other at the three peaks that can be matched (the average is five months) and leads slightly at the three troughs. This suggests a very long term for backlogs of orders in the heavy industries at peaks in business, and certainly this is sensible.

Concerning the problem of the technical character of the indexes, the CPA data for both sales and purchase orders are diffusion indexes of answers which themselves have no quantitative dimensions, but only a direction of change. It is possible that the *amount* of change tends to have a different pattern for sales and purchase orders. The census data are of course first differences of unfilled orders proper, which take the quantitative aspects of change into account.

A second possible technical basis for the high order of similarities for the CPA reports on sales and purchase orders outstanding could simply be that the same man, the purchasing agent, no doubt makes both reports. His judgment about what is happening to backlogs of sales orders may be colored by what he feels it necessary to do about buying—his own bailiwick.

CAPACITY LIMITATIONS

The Concept

All that has been learned about change in ownership of materials suggests that both buyer and seller participate in causing waves of market extension and contraction. This is dictated, in part, simply by the compound character of the phenomenon. It is dictated also by the fact that the cost of market extension is for the buyer an alternative to other ways of coping with the same problem; for the seller, rationing supply by selecting those customers who are willing to wait is an alternative to selecting those customers who are willing to pay a higher price.

However, it is perhaps also true that the entire phenomenon could be accounted for almost entirely in terms of delays in deliveries announced by suppliers, at times when the market could support them. This is an extreme statement and its truth or falsity is not important. A less extreme statement is clearly true: seller-instigated delays in delivery can be an important cause of market extension. How could a time series suggest the presence of this influence?

At first thought it might seem that the answer is simple—by a noteworthy parallelism between an index of percentage of capacity utilized and one depicting market extension. But a moment's thought disturbs the simplicity. Why should an increase in utilization from, say, 50 to 60 per cent have the same impact as an increase from 90 to 100 per cent? A more reasonable supposition may be that the increase from 50 to 60 per cent has no impact at all. This line of thought implies that a hypothetical perfect correspondence between time series on capacity utilization and materials outstanding could be something other than parallelism: extension might not start until utilization reached some minimum level. The association once underway might not be linear; rates of change might also be relevant.

A further difficulty concerns the degree to which capacity ceilings result from, on the one hand, growth in final demand, plus change in the stocks necessary to service it efficiently or, on the other hand, from growth of intermediate demand associated with the interplay between expectations and other short-term shifts in costs as visualized by buyers as well as sellers. Insofar as the first factors operate alone, capacity ceilings could be a chief cause of buying waves. Insofar as the second are also involved, they are at most only one of other contributing causes.

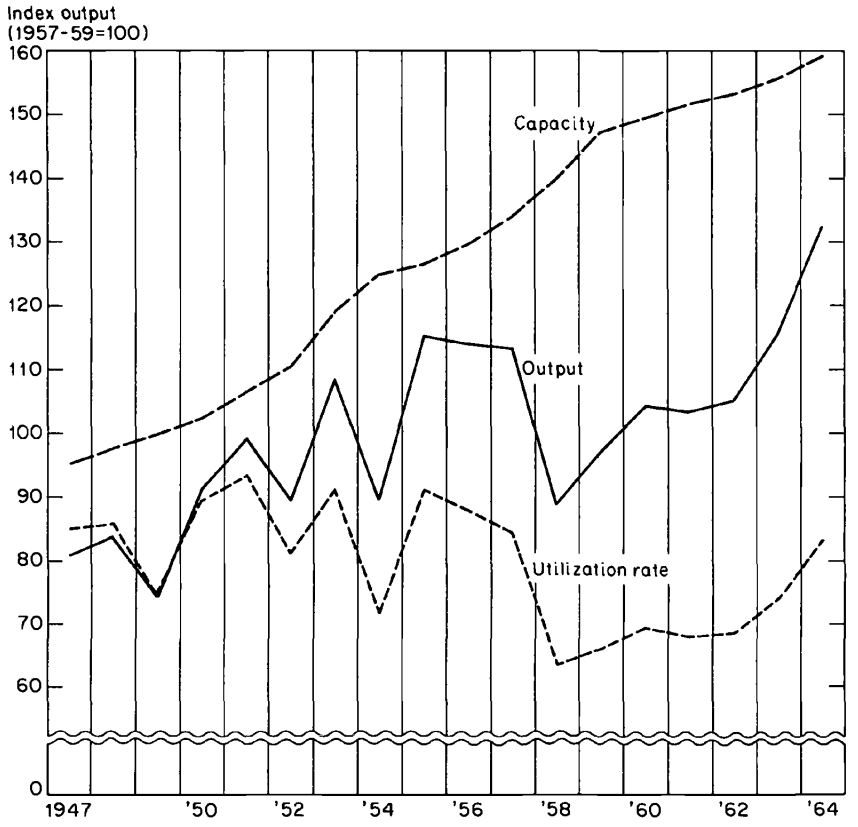
Obviously, then, it is not easy to specify precisely how evidence can inform on process. But in view of the character of the evidence, there is no reason to worry about the refinements. What, then, do the time series show? They show, in the first place, that they are most uncooperative. The basic difficulty is that the active element in estimates of percentage of capacity utilized is utilization. Utilization, ordinarily registered by an index of production, reflects the total level of demand whether for final sales or intermediate requirements of any sort. There is, therefore, no way to cleanse the picture of capacity limitations which are themselves the result of expected capacity limitations. The difficulty is accentuated by the fact that the data are annual. An interpolation for shorter time intervals virtually excludes any influence other than simply the current level of production.

The Data

Chart 13 presents the dilemma. The figures are those compiled by the Federal Reserve Board for the metals segment of "major materials." Capacity is based on engineering es-

CHART 13

Capacity and Output, Major Metals Materials, 1947–64



Source: Federal Reserve Board, Division of Research and Statistics.

timates.[16] The figures for 1962–64 exclude steel ingot capacity, reports on which were discontinued by the industry. All of the peaks in percentage of capacity utilized occurred in the same year as those of output. Thus the utilization series merely changes the trend of the output series from a rising slope to a level or declining slope (whether level or declining would depend on what inclusion of data for steel ingot capacity would do to the index).

A second group of information on plant utilization is reported by corporate officials in response to the McGraw-Hill Survey. It provides the basis for estimates of capacity utilized in the durable materials industries, as they have been defined in this study, for 1954–62. After 1962 the steel reports are not available; accordingly, the index with iron and steel omitted is also shown.[17]

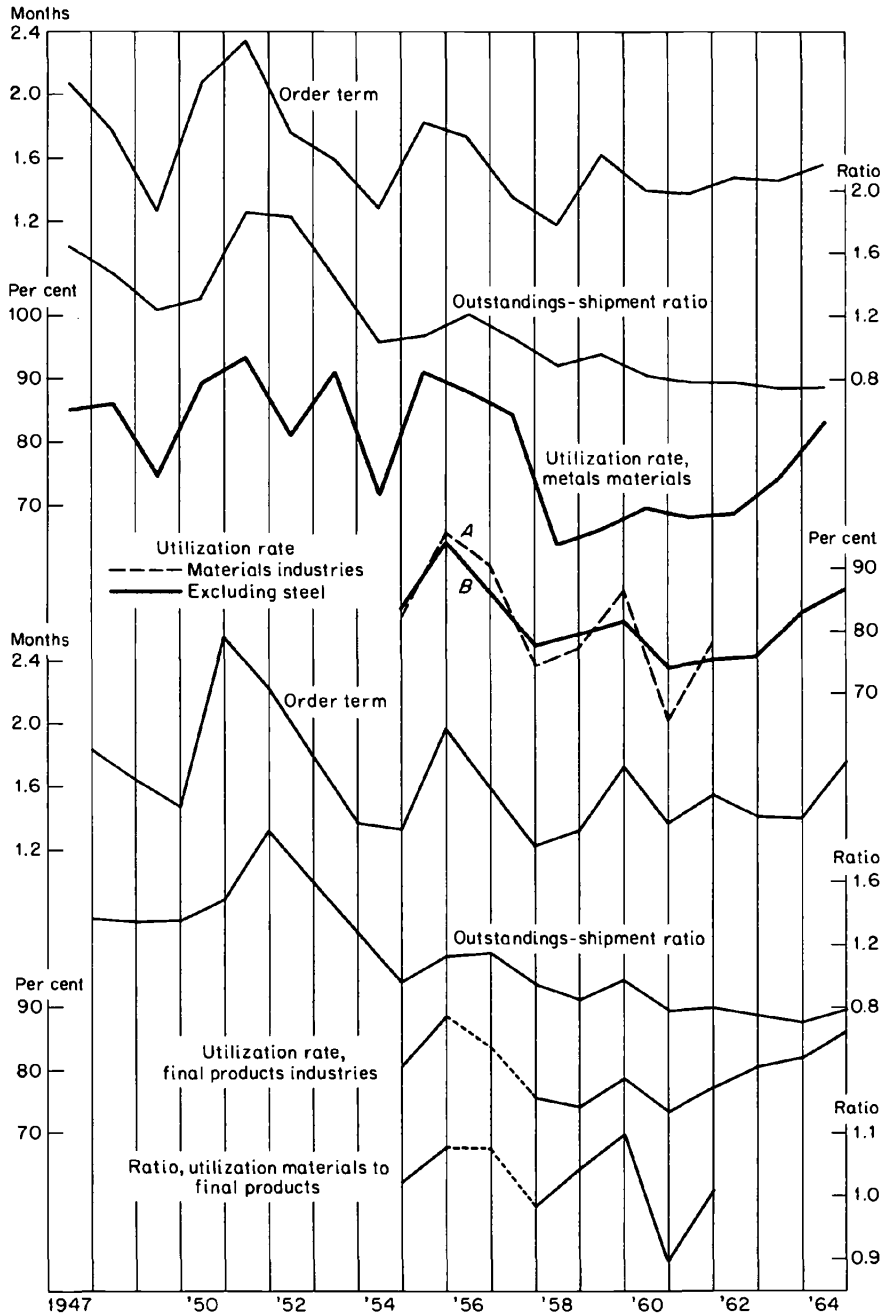
The McGraw-Hill materials industries index differs from the Federal Reserve Board major metals materials in several respects. For one thing, the former is dated December of each year and the latter covers the full year. For another thing, the coverage of the figures is, as I have described, different.

[16] The data are unpublished and I am indebted to Frank de Leeuw for making them available.

[17] The capacity estimates are published for the two-digit industries covered in our analysis for the durable goods materials group. I have combined them, using output weights.

CHART 14

Capacity Utilization Rates Compared with Outstanding Orders and Order Terms, 1947–64



Notes: Order term is the Chicago Purchasing Agents Association Series on the average delivery term for purchase orders for major materials previously shown on a monthly basis. Curve 1 gives annual averages; curve 5 gives December figures.

Outstandings-shipment ratio is based on the Commerce data for durable goods materials manufacturers, previously shown on a monthly basis. Curve 2 gives annual averages; curve 6 gives December figures.

Utilization rate, metals materials. Curve 3 is FRB data as in Chart 13, curves 4A and 4B are McGraw-Hill data (see text).

Utilization rate, final products industries (curve 7), based on McGraw-Hill data (see text).

Ratio, curve 8, is curve 4A divided by curve 7.

Chart 14 shows both series, and there is no way of judging whether the difference in their course is due to conflict or to the technical differences. In any event, the two estimates of capacity utilized each drawn with a heavy line in the chart, may be compared with economic data which might be causally related. I choose outstanding orders and vendor performance, and they are shown above as annual averages (compare with curve 3) and below as December figures (compare with curves 4A and 4B).

Doubtless the annual figures are not adequate to display the subtleties of timing association. Nevertheless the troughs in outstandings seem to synchronize rather than lag, as they would if utilization rates did not influence buying until they had exceeded some trigger level. The dip in plant utilization in 1952 and its failure to peak in 1959 is no doubt associated with the long strikes in those years. Perhaps the most damaging aspect of the association is the very modest rise in outstandings in response to the sharp increase in capacity utilization in 1955 and 1956.

Rather more interesting is the visual correspondence with the average term of purchase orders (top or fifth curve), which incorporates the answers of purchasing agents to the question, "How far ahead must you buy in order to have principal materials on hand when needed?" Again, the low utilization rates in 1952 and 1959, doubtless associated with the strikes, do not have a corresponding tendency to improve vendor performance (cause the curve to fall). Allowing for this, there appears to be a general similarity in the direction and orders of magnitude of the movement in the two series—curves 1 and 3, or 5 and 4. And certainly, if activity in a plant starts to press on available capacity, customers are likely to find that they have to order farther ahead in order to have the product on time. Of all the factors influencing ownership that have been examined, the average order term is the one that should most exactly transmit the impact of tight or slack supply conditions.

Of course, the figures say nothing about the sort of process that is involved in the deteriorating performance of vendors—whether, for example, it is associated with pressure from final demand or from a buildup in intermediate demand. One fragile piece of evidence on this point is afforded by a second segment of the McGraw-Hill data—an index covering the industries in our final products group (curve 7, Chart 14).[18] Though the average utilization rate in these industries is about the same as for the materials group, it fluctuates substantially less (compare curves 7 and 4A). The bottom curve, the ratio of the utilization rate of materials to that of final products, replicates much of the movement of its numerator. For whatever the figures are worth, they argue that something which happens as demand moves to earlier stages exacerbates variations in planned utilization.

However the basic difficulty sketched at the start of the chapter remains: it is hard to say how parallelism in market extension, or even in the speed with which vendors make deliveries, and capacity limitations should be interpreted. What is the meaning of the association which the statistics seem mildly to display? For one thing there is a question whether the timing is really appropriate as evidence of association. Why should order terms start to extend just when utilization rates first start to increase? At such times, there should be plenty of capacity to meet the increased demand; an analogous argument speaks for lags at peaks also. In any event, even if the association did have causal implications, there is no indication as to

[18] Capacity utilized in the following industries was combined using Federal Reserve Board production weights: machinery, electric machinery, autos and trucks and parts (except for December 1956), transportation equipment and aerospace. The auto group was not included in 1956 and therefore, as the dashed line in the chart indicates, the data for 1956–57 are not entirely comparable with the other years.

whether it resulted from a quasi-independent high level of utilization, from expectations of shortages and further actions which could be generated in the intermediate industries group, or from the two types of influence in combination. Perhaps all that can be safely said is that high utilization rates appear to have characterized some of the periods in the past when other signs of market extension were numerous and strong.

SUMMARY OF EVIDENCE

The question with which the chapter started—What are some of the factors other than sales that influence ownership?—has been answered largely in terms of a change in conditions in the market in which materials are bought, and in factors that influence the cost of taking these changes into account. Exclusion of other potential influences was forced by the absence of information on them. Even for the market-oriented group, the data permit no more than a highly impressionistic description. However, the time series that have been examined generally support the notion based on considerations of the functions that stocks serve in a business enterprise.

The following observations summarize the findings:

1. There does seem to appear in the aggregate data evidence that expectations about market conditions change very materially from time to time. (a) They undergo cyclical fluctuations which reach their high points some months prior to those in general business. (b) Their periods of most rapid rise occur quite early in expansion, participating very strongly in the phenomenon that I have called the first thrust of expansion. (c) A number of the series that reflect market conditions appear to rise very steadily during these periods and then reverse abruptly without the usual interval of retardation.

The logic of business problems prescribes that a number of factors are likely to participate in market-oriented fluctuation. The tables and charts that have been reviewed provide evidence that a number of these happenings are characterized by broadly similar patterns of change: backlogs of sales orders may accelerate or profits rise, thereby changing the costs associated with advance buying; suppliers may demand a longer delivery period, or prices may be expected to rise, thereby changing conditions or expectations concerning conditions in the materials market.

But though these influences are often likely to change together and consequently to act on materials procurement with united force, their patterns are far from identical. It is therefore instructive, by way of summary, to point to such differences in behavior as appear with sufficient persistence to seem potentially meaningful. The behavior will then be linked with its meaning as suggested by the analysis of market phenomena with which this chapter started.

Differences are exhibited in Table 39. There, all of the evidence bearing on each factor that may influence market conditions or expectations is compared with the evidence concerning levels of market positions and their rates of change.

2. Unfilled sales orders tend to lag outstanding orders for materials (lines 1 to 6). Defined in terms of rates of change, they lag by short intervals, particularly at peaks (section B). Defined in terms of levels of outstandings, the lag is clearer and somewhat longer, especially so at troughs (section A). The association shown in the purchasing agents' reports is quite close when rates of change are compared; however, as explained earlier, technical aspects of the data may overstate similarities. For the book-value information, confluence is low except when the rate of change in backlogs is compared with the level of materials that are outstanding about

TABLE 39

Average Timing of Market Factors Compared with Outstanding Materials Orders, Durable Goods Manufacturers, 1946-62

Series Reflecting Outstanding Materials Orders (reference series)	Series Reflecting Type of Market Factor and Series (specific series)	Basis of Comparisons: A: Data Proper — Timing[b] P	T	All	Months in Phase[a]: Timing Adjustment	%	B: Rates of Change — Timing[b] P	T	All	Months in Phase[a]: Timing Adjustment	%	Source Table	Line
	Unfilled Sales Orders												
1. Outs. orders*	Unf. Orders, Fin. Prdt.*	+5	+5	+5	+4, +5	77						1	12
2. Chge. outs. orders*	Chge. Unf. Orders, Fin. Prdt.*						+5	-2	+1	0, +1	77	38	5
3. Chge. outs. orders*	Backlog Sales Ord., D. I.!						+3	0	+1	+1, +2	83	38	6
4a. Chge. av. term purch. ord.!	Backlog Sales Ord., D. I.!						+1	+2	+2	+2	86	38	8
4b. Vendor perform. D.I.!	Backlog Sales Ord., D. I.!						-1	+1	+1	0	79	38	9
	Prices												
5. Chge. outstandings*	Chge. Metals Prices						+1	-3	-2	-1	68[c]	38	3
6. Ratio outs. to ship.*	Metals Prices	-3	-4	-4	-3	80[c]						35	11
	Profits												
7. Ratio outs. to ship.*	Profits Dur. Gds. Mfrs.	-7	-6	-7	-7, -8	89[c]						35	15
	Vendor Performance												
8. Chge. in outs.*	Vend. Perform., D. I.!						+2	0	0	0, +1	82	38	1
9. Ratio outs. to ship.*	Vend. Perform., Proper!	-3	-1	-2	-1 to -3	88						35	5
	Av. Term of Purch. Order												
10. Chge. in outs.*	Chge. Av. Term!						+2	-2	-1	0, -2	79	38	2
11. Ratio outs. to ship.*	Av. Term! Purch. Ord.!	-5	-5	-5	-3 to -5	87						35	8

Notes to Table 39

!The series covered are the ones already familiar to the reader. However to aid in identifying them, those for which the source is the Census data for durable goods manufacturers are marked, and those for which the source is the Purchasing Agents Association of Chicago are marked!.

[a]The period that is covered is 7/46 to 12/61; exception, see note c.

[b]Number of months whereby market factor (Col. 2) lead (-) or lag (+), outstandings (Col. 1).

[c]Refers to the period 1/49–12/61. The timing for the rate of change in prices compared with the level of outstandings was: P, -12; T, -13; All, -12; 73 per cent of months in phase allowing for 12 or 13 month lead.

half a year later (Table 38, line 11). In general the picture is consistent with the notion that the presence of order backlogs tends, other things the same, to reduce the risk-cost of advance-materials ordering. However, the less than regular association, and the fact that extension of materials tends to precede that of finished products, indicates that other things are by no means the same. For one thing, we see that at least the backlog of sales orders needs to cease declining (or building up) at an increasing rate some months before procurement officers begin to extend (or contract) their orders outstanding. For retailers, since all sales tend to be for immediate delivery, the influence is entirely absent.

3. Profits, thought of as a source of funds, could also affect the costs that bear on procurement policy. Profits exhibit an impressive association with outstandings expressed in terms of months of sales about a half a year later. Eighty-nine per cent of months are in like phase. How can this association be explained? One possibility is that there is no direct causal link; instead we see merely parallelism in two sensitive representations of many things affecting sales and purchases. But there is a possibility that the confluence reflects a change in the opportunity cost of capital for firms that finance inventories largely with internal funds. The argument runs as follows: when internal funds are temporarily plentiful, businessmen are willing to invest the excess over normal supply of funds in assets that are relatively liquid (such as inventories or short-term financial obligations), but are unwilling to invest them in assets that will tie up the funds during times of possible future need. Thus the true opportunity cost of funds for inventories shifts from that of basic earning rates in the business to that of interest on liquid assets such as bonds or the like. As far as I know, the possibility of discontinuities of this sort has not been studied. It should be. For if there is anything to my argument, it would underscore the immunity possessed by some large firms, which finance stocks from internal funds, to efforts to restrict quasi-speculative inventory buying through monetary policy. For these firms, the argument would imply, not only would the restrictive monetary policy have little direct impact via a higher interest charge, but costs of funds for holding stocks could in effect actually be lower rather than higher (due to the shift in the appropriate opportunity cost) at just the times when credit stringency is developing.

4. Of the factors that bear on conditions in materials markets, sensitive prices are an obvious candidate. Prices tend to lead outstandings whether compared for department stores (Table 36, line 3) or for durables, whether as data proper or as rates of change (Table 39, lines 5 and 6). This is clearly not in accord with the causal explanation that moves from the actual rate of change in prices, through the expected rate of change in prices, to the desired level of ownership. The logic implies synchronous association between the rate of change in prices and the level of ownership. Instead, changes in

prices lead the level of ownership by about a year (Table 39, note c). The last chapter describes what a relationship of this sort might imply.

5. The time series also supply evidence concerning what earlier in this chapter I called the analytic components of increase or decrease in materials outstanding. The first component, outstandings associated with change in sales and sales-linked stocks, I have tried to remove by using ratios or first differences. But evidence on the others—changing delivery periods in the several categories (numbers 3 and 4), and changing weights in total outstandings of deliveries in each category (number 2)—is afforded by the body of data collected by purchasing agents concerning what they and their suppliers do—actions that affect these matters of delivery terms and their relative weights. This entirely independent source of information shows noteworthy correspondence to the level and rates of change in the book value of outstanding orders of materials.

The speed with which vendors offer to supply major materials ("vendor performance") accelerates or decelerates at much the same time as total orders outstanding (Table 39, line 8). Though there are minor differences, the same statement applies to rates of change in the average term of purchase orders (line 10). The first series is confined to changes in delivery periods—analytic component number 3; the second includes changing relative weights of advance and "at once" deliveries, component number 2.

The data proper have a different though quite systematic association (lines 9 and 11). The average term of purchase orders starts to decline and vendor performance starts to improve several months before the total volume of outstandings (expressed in months of sales) turns down; a like remark, toned down, applies to the trough comparison. The lag in outstandings may reflect, among other things, the tendency for orders bearing long delivery terms to remain outstanding after fewer new orders of these terms are currently being written. In this sense, the explanation is analogous to that of the long lead of outstandings relative to stocks that was suggested earlier.

6. For department stores, such evidence of parallelism as the data afford does not justify an effort to distinguish the particulars of factors bearing on outstandings. Clearly, relevant data on market conditions are lacking. Nevertheless, in view of these deficiencies, there does seem to be an association worth noting between the level of outstandings expressed in terms of months' sales and the rate at which vendor performance was improving or deteriorating two months earlier. Eighty-one per cent of months were in phase (Table 36, line 6). The rate of change in stock also showed a close relation to this series with a two months' lag—84 per cent of the months were in phase (line 12). As we shall see in the next chapter, it is quite possible that the seasonal and other problems of retail stores mean that levels of outstandings and rates of change in stocks on hand reflect rates of change in market conditions.

7. These various particulars of timing association are interesting and bear on the dynamics of the process of inventory fluctuation. Individually, the bits of evidence are frail. Collectively, they seem to make a more reliable assertion: the rates of change in each of the variables that constitute market conditions tend to move, broadly speaking, within a few months of one another. Note the similarity of timing for all items in the second set of columns (section B), in which the rate of change in each market factor is compared with the rate of change in outstandings. This fact seems to underscore the interrelatedness of the compound phenomenon of fluctuation in ownership. Whether individual businessmen tend to change their market positions primarily because they expect prices to rise, deliveries to tighten, or other costs to change, they will all tend to do the same thing at the same time.

8. Is it possible to separate, at least collec-

tively, the group of factors affecting intermediate demand from those affecting the supply side of materials purchasing? A negative reply was developed in the last section of the chapter. Though there was evidence of some parallelism between the level of capacity utilization and the average term for which the materials remained outstanding, the fact of parallelism has an unclear causal interpretation. Certainly some of the more extreme episodes of advance buying occurred when utilization rates were high, but the waves seem to start and stop before the capacity thesis affords an explanation. Moreover, there seems no way to separate pressure on capacity ceilings that result from customers' concern over possible shortages from the pressure that would have resulted had this concern, and the buying that it stimulated, not existed. The time series are lines on a two dimensional surface. They are incapable of describing the crooked wormhole that events bore through the N-dimensional space.

Without doubt both expectations of shortages and actual levels of demand must be involved. But I would like to hazard a guess that their impacts are not simply additive. Pressure on capacity that is a function of the flow of products into final use tends to sensitize the economy to buying waves. Since it is reasonable to assume that plants are tooled up to handle at least the basic levels of previous final use, this pressure may result largely from the high rate of change in final use. When pressure of this sort exists, any further increase in demand (which may be due to changed expectations, or any of the other elements that are associated with changes in the timing of materials buying) will cause more serious pressure than it otherwise would. Further, rounds of cause and effect follow. If this is so, it raises some questions of public policy with respect to the desirability of encouraging manufacturers to maintain second-string idle capacity. It may be that tooling up so that profits are only adequate at high levels of plant utilization contributes to instability in the economy at large.

This chapter has tried to hold the influence of sales at arms' length while "other influences" are examined. Yet there is every reason to believe that these two groups of changes do not simply total their influences but change as they combine. Certainly it was not possible to think about the role of capacity limitation or any other piece of the total without recognizing the geometry of interplay between supply, demand, and expectations. Nor can we conclude the analysis of the dynamics of the inventory cycle without opening this troublesome and yet fascinating Pandora's box.