MONTHLY

Business Review

FEDERAL RESERVE BANK of CLEVELAND

May 1955

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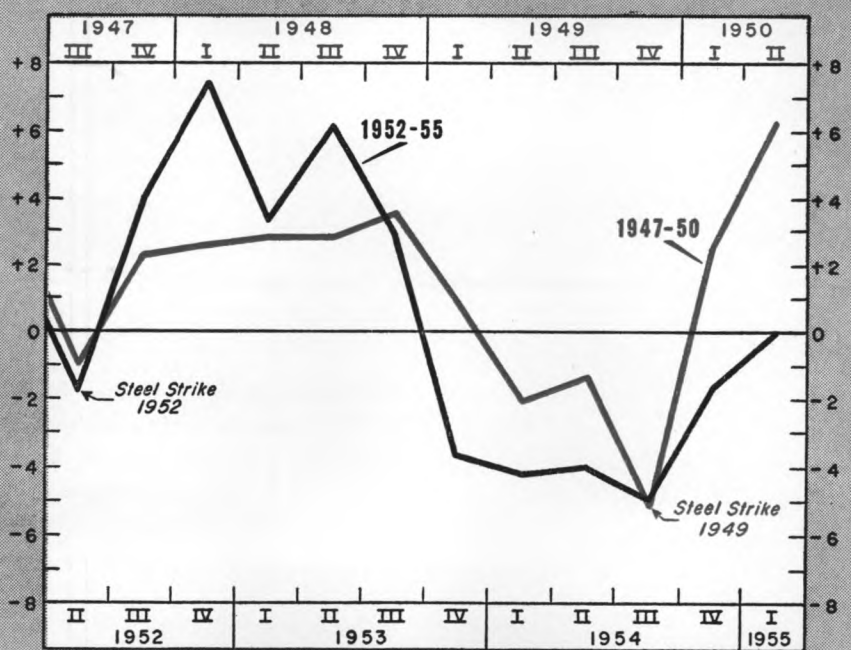
TWO CYCLES IN BUSINESS INVENTORIES

Changes in Billions of Dollars at Annual Rates



Seasonally adjusted, nonfarm only.

Source of data: U.S. Department of Commerce, national income and product series.

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Inventories and the Business Recovery

THE SUSTAINED VIGOR of the general business recovery which has been under way since early last autumn raises some important questions regarding the current role of business inventories.

It should be recalled that sharp changes in the rate of business inventory investment played a key role in the economic instability experienced during 1948-50 and again during 1953-54. Has inventory investment now become largely stabilized, or is a period of rapid accumulation in prospect? Are inventories an especially important factor to be considered in appraising the current business situation? Help in answering such questions may be obtained by examining recent developments in the inventory sector, as well as the performance of business inventory investment in previous years.

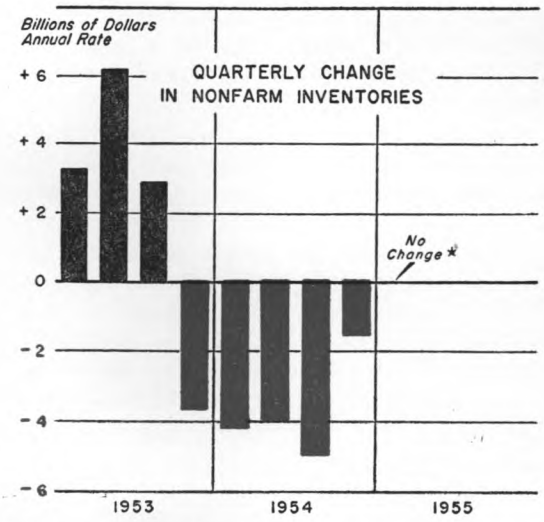
An accompanying chart indicates that inventories (nonfarm) were being liquidated during 1954, with the peak rate of reduction occurring in the third quarter when stocks were falling at a $5 billion annual rate. It is significant that in the fourth quarter of last year, when business conditions were beginning to improve, inventory reduction was slackening to an annual rate of $1.6 billion. This means that goods which previously had been supplied from stocks on hand were being obtained through an expansion of current production. Such inventory-based expansion accounted for 50 percent of the net increase in gross national product between the third and fourth quarters of 1954. According to preliminary estimates, the rate of business inventory investment continued to shift during the first quarter of 1955 to the extent that inventory liquidation was completely halted.

From Recession to Boom

In many respects the similarities between the recessions of 1954 and 1949 are striking. The durations of the two downturns and their impact on industrial production and employment were closely similar. Both periods were dominated very largely by fluctuations in business inventory investment, although other factors, especially declining Government defense expenditures in 1953-54, were also important.

The chart shown on the cover compares the cycle of inventory investment during 1947-50

The heavy inventory liquidation characterizing last year's business recession lessened in the fourth quarter and ended in early 1955.



* Early estimate by Council of Economic Advisors.

Source of data: U. S. Department of Commerce, national income and product series.

with that of 1952-55. It can readily be seen that there is a resemblance between the two cycles. The resemblance becomes even more marked if allowances are made for the effects, and after-effects, of the steel strikes of October 1949 and June-July 1952.

The rising line applying to the fourth quarter of 1954 and the first quarter of 1955 indicates that inventory investment was increasing at an average annual rate of about $2.5 billion during that six-month period. Will it continue to rise as it did in the corresponding 1950 recovery period, generating or reinforcing a major business boom in the process?

The answer seems to be that inventory investment may very well increase further, but not as rapidly as it did in early 1950. There are some differences as well as likenesses in the inventory situations now and five years ago. During the entire 1946-49 period, inventory accumulation had been restrained, first by the intensity of consumer demand in the light of capacity limitations, and later by business conservatism. Between 1949 and 1954, however, the value of business inventory holdings rose by percentages appreciably greater than the gain in business sales or the gain in gross national product. Part of these inventory additions were related to the expansion of defense production, but a large part also were accumulated to support normal civilian sales.

The fact that the recent inventory liquidation ended well before stocks had fallen to a level (relative to sales) comparable to that of 1949 indicates that the level of stocks relative to sales which business wants to maintain has risen during the intervening years. The most likely reason for this rise appears to be a striking improvement in business confidence. The specter of a serious postwar depression began to fade in 1949 after it became clear that the recession then taking place would be short and mild. In the first half of 1950, the spurt in inventory investment was reflecting not only the immediate improvement in business conditions, but also an upward shift in the longer-term concept of a "normal" stock-sales relationship. No such upward shift appears to be in process now.

Inventories Related to Sales

While an inventory boom of the 1950 proportions does not seem to be in the offing, the recent improvement in general business conditions, particularly the large gains recorded by business sales since last October, seems to imply further increases in inventory investment.

It is widely recognized that the principal factor influencing business inventory investment under relatively stable peacetime conditions is the volume and trend of business sales. During the peacetime years since World War II, aggregate business inventories, as reported monthly by the U. S. Department of Commerce, appear to have followed fairly closely the movements of aggregate business sales, after a delay of some three to five months. The delay is apparently related to the time it takes a given change in sales to be recognized by a business firm and then translated via orders and production into physical changes in stocks on hand.[1] Thus, an average of the monthly stock-sales ratios, computed by dividing current stocks by the volume of sales four months previous, for example, provides a sort of period benchmark or "norm" which may be used to indicate whether stocks in any particular month or months are unusually high or low (for the general period) in relation to sales.[2]

The red lines in the accompanying charts represent the calculated "normal" inventory-sales ratios (in the sense defined) for the periods represented. The bottom chart shows

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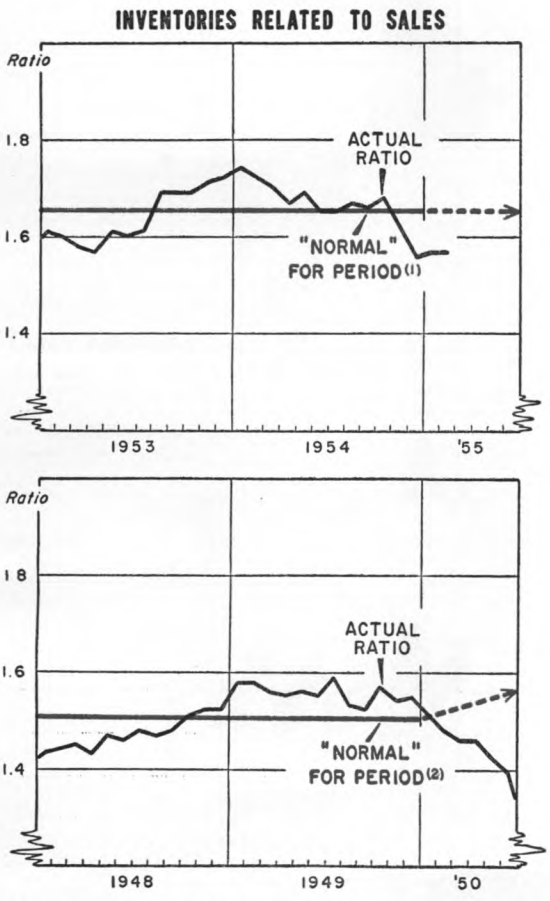
(1) The empirical fact that movements of inventories are more closely related to previous movements of sales than they are to current movements of sales can be established by inspection of charts which are not shown here. The "best" choice of period for the lag of sales is not germane to the current argument; correlation coefficients have not been computed in this connection.

(2) For instance, end of January inventory totals are divided by sales totals of the previous September. An average of such monthly ratios is then calculated for a selected period during which the ratios appear relatively stable.

The use of the term "normal" in this context is for convenience only, and is not intended to imply a permanent or inherently desirable relationship of inventories to sales. The term is used as a caption in the accompanying charts to provide a short-cut for the longer expression "period averages of stock-sales ratios, based on lagged sales".

Inventories currently appear to be low in relation to business sales, when the norm prevailing during 1953 and 1954 is used as a reference point.



(1) Average for 1953-54: ratio of month-end inventories to sales four months previous, both series seasonally adjusted.
(2) Average for 1948-49: ratio of month-end inventories to sales four months previous, both series seasonally adjusted.
Source of data: U. S. Department of Commerce, monthly book-value series.

how at the end of the 1949 recession, the "normal" inventory-sales ratio was shifting upward from its extremely low 1947-49 level of 1.50. In contrast, in early 1955 the "normal" ratio appeared to be holding steady at the 1.65 level which prevailed throughout 1953 and 1954.

The black lines on the charts represent monthly ratios of inventories to sales, calculated without any delay or lag, i.e., January inventory totals are divided by January sales totals, etc. It follows that the actual ratio (black line) tends to move toward the "normal" ratio (red line). The reasons why the two lines seldom coincide lie in the instability of sales and the delay in effecting inventory adjustments initiated because of changes in sales. During the three to five months it takes inventories to respond to a change in sales, sales usually change again. Then too, changes in inventory investment tend to induce further fluctuations in business sales, since much business inventory buying is from other business units. The latter factor creates a tendency for inventory movements to become cumulative and self-perpetuating, if not counteracted by offsetting developments in other sectors of the economy.

Despite the oscillations, the fact remains that, at any given time, inventory investment tends to change in such a way as to restore the normal relationship (for the period) between the level of inventories and the level of sales. In early 1953, for instance, heavy inventory investment took place because inventories were too low in relation to sales (represented on the chart by the position of the current inventory-sales ratio below the "normal" ratio). By August 1953 a better balance between inventories and sales was achieved and inventory accumulation was coming to a halt. The equilibrium was short-lived, however, because by this time sales had begun to fall, sending the current ratio above the "normal" ratio. Inventory liquidation followed.

By the third quarter of 1954, inventories had declined to a point where they were again in better balance with sales. Had sales held steady, inventory investment would have tended to stabilize at a zero rate, i.e., with the existing stock of goods just being maintained, but not increased or decreased.

Equilibrium was not to be had, however, for just as inventory liquidation was slowing of its own accord, the auto industry embarked on a spectacular production boom. Business sales, which were already experiencing some stimulation from the cessation of inventory liquidation, as well as from the high and rising level of construction activity, were further

stimulated by the surge of activity in the auto and related industries.

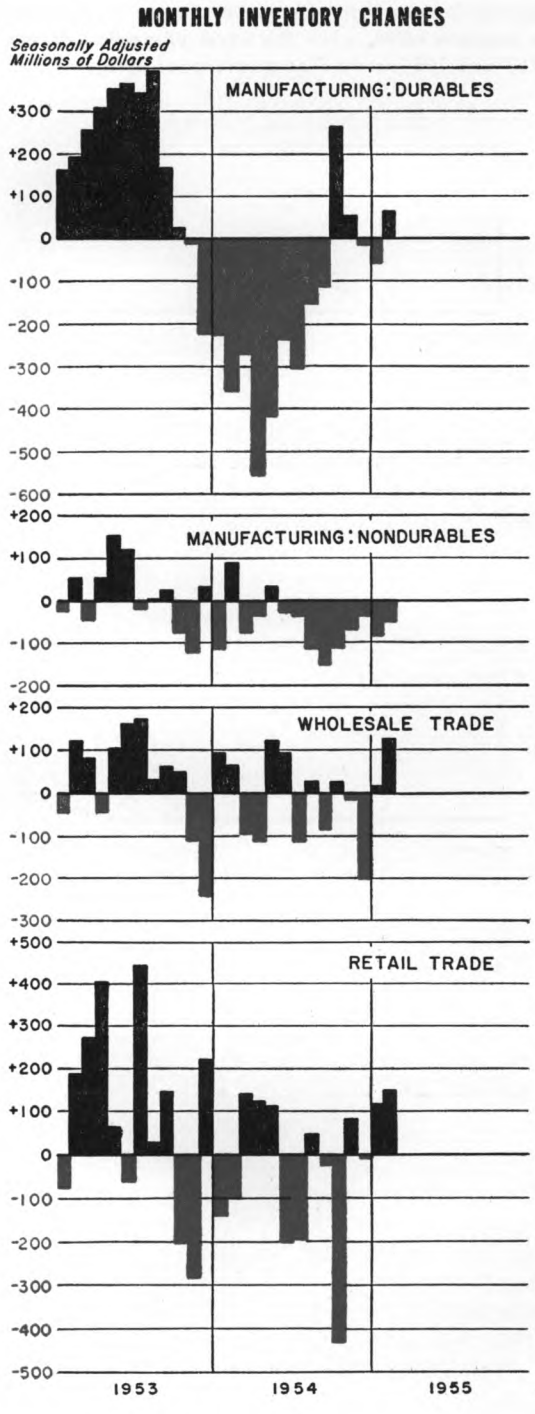
Sales volume jumped and inventories were involuntarily reduced further by the rush of orders from industry and by a spurt in consumer demand, so that by the end of the fourth quarter, stocks were well below the "normal" relationship to sales. With business sales continuing to rise during the early months of 1955, the existence of a wide gap (fully as wide as in early 1953) between the current and the "normal" level of inventories would imply that a sharp increase in the rate of business inventory investment was impending. The rather tense international situation, the prospect of industrial price increases, and the threat of supply interruptions because of labor difficulties could be listed as providing additional incentives to build "protective" stocks even beyond the levels dictated by sales (and production) trends.

Limiting Factors

The above analysis indicates that, on the basis of past relationships, a new inventory boom is well within the range of possibility. A number of other factors, however, throw doubt on such an outcome.

There is nothing absolutely fixed about the 1.65 ratio of inventories to sales which persisted throughout 1953 and 1954. Such ratios have changed in the past (witness 1949-50) and will no doubt continue to change at times in the future. Particularly, an erosion of business confidence in the long-term economic outlook would surely result in a sharp reduction in the "normal" ratio of inventories to sales. At the present time business confidence seems quite secure, but as the Secretary of Treasury has recently stated, "Confidence is a subtle thing. It is built slowly and can easily be shaken."

Furthermore, there is an important limitation to an analysis of the type just presented, insofar as it depends upon *aggregate* sales and inventory movements. The use of aggregates ignores the cross currents often present among the diverse components of business sales and inventories. Manufacturers, whole-



salers, and retailers of all varieties and descriptions, with widely varying inventory practices, are all lumped together. This fact does not necessarily invalidate analysis based on aggregates, however, as long as the various business sectors maintain fairly constant positions relative to each other.

An accompanying chart illustrates how the durable goods manufacturing industries dominated the 1953-54 inventory cycle. Major inventory cycles, however, usually center in the durable goods industries because of their high inventory-sales ratios and the instability of consumer demand for durable products. This tendency was present in 1949-50 and has again been evident in the early stages of the current business recovery, thus helping to maintain the comparability of the periods.

One factor that might differentiate the 1955 business recovery from its recent predecessors is the unusual concentration of the upturn within a very few individual industries — at least in the early stages of the recovery. The motor vehicle and equipment industry alone[3] accounted for half of the aggregate increase in total business sales (seasonally adjusted) between August 1954 and January 1955. Steel, rubber, and other industries closely related to the auto industry accounted for a large part of the remainder.

The impact of the auto industry upon recent inventory changes is demonstrated on the last chart by the developments in October of 1954 when, during the auto model-changeover period, a $300-million drop in the stocks of the automotive group at retail was matched by a $200-million buildup of inventories by auto manufacturers. These changes dominated the aggregate business inventory statistics. Again in January and February, 1955, large increases in retail auto stocks weighed heavily in the aggregate inventory totals, although a number of offsetting fluctuations were taking place.

As long as one industry tends to dominate the movements of aggregate sales and inventories, there is little chance that an extended inventory cycle will develop. An essential element of a major inventory cycle is the sales momentum generated when various industries simultaneously attempt to carry out identical inventory policies by buying from (or selling to) each other.

Between August and January, the upturn in production and sales was too heavily concentrated in the auto industry for this requirement to be met. However, during February, March, and April, participation in the business expansion definitely broadened. Consumer demand remained strong, and business expenditures for plant and equipment appeared to be reversing the declining trend of the past year and a half. The latest data on manufacturers' new orders, which usually anticipate sales movements, show rather general increases for a series of industries, such as machinery, primary and fabricated metals, and certain nondurable goods.

To the extent that the current broadening of the general business upturn succeeds in freeing the recovery from its dependence upon the vagaries of the auto industry, the chances of a resumption of active inventory accumulation are enhanced. Inventory fluctuations are certainly capable of playing a major part in determining the course of business activity in 1955.

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(3) Manufacturing, wholesale, and retail taken together.

Hog Prices After a Year of Slide

RECENT WEEKS have seen an encouraging rally in hog prices. Farmers, lenders, and other interested observers are hopeful that these gains mark the return of a seasonal movement which has been largely missing from the hog market since the winter of 1953-54. Over the 46 weeks prior to mid-March, hog prices skidded 44 percent, or nearly one percent a week. During at least two fairly extended periods within this span, hog prices were running contrary to the seasonal pattern.

Over the years, pork *production* tends to follow a cycle alternately overshooting and undershooting market requirements. When the production cycle is in a rising phase, the normal seasonal influences on price are sometimes overpowered; such was probably the case over the past year. Other factors have also had a bearing on the long price decline.

In the Fourth Federal Reserve District, hogs account for $155 of every $1,000 the farmer receives; in western Ohio the proportion runs to nearly $250 for each $1,000 of cash receipts.

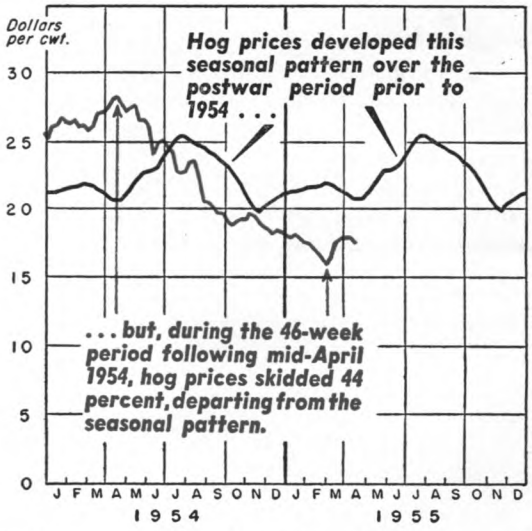
Extent of the Hog Price Decline

About a year ago, during the winter and early spring months, hog prices were at or near record levels. By March of the present year, such prices had sunk to the lowest point for the month in nine years. The price slide began last spring at a time when a sharp upswing would have conformed more nearly to seasonal expectations. (See chart.) The decline continued during the summer and fall months in line with the usual seasonal decline.

Prices continued on the toboggan through December and on up into March of this year, even though price strength would again have been more in line with seasonal expectations during that period.

Despite the relatively modest recovery since mid-March of this year, hog prices are still far below the year-ago levels. During March and early April, it would have taken 27 hogs to make a $1,000 mortgage payment, compared with only 17 hogs a year ago. Both farmers and machinery dealers have been keenly aware that it took the equivalent of about 60 hogs to pay for a tractor this spring, whereas 40 hogs paid the transaction a year ago.

While the decline in hog prices over the past year has been a spectacular one, an ap-



Weekly averages of daily Chicago quotations for choice medium weights. The seasonal pattern is smoothed by use of a three-week moving average.

Source of data: Market News, U. S. Department of Agriculture.

praisal of its significance should be tempered by at least one further consideration. Prices were unusually high during the spring of 1954; part of the slide since then might, therefore, be considered as a return to more normal levels. By November of 1954, after six months of general decline, hog prices picked up a little, reaching a position only a few cents below the postwar average level for the season. (See chart.) At that time, it might have appeared that the transition to normal patterns had been completed. As it turned out, however, further weakness after November brought hogs down into the price range where the less efficient feeders were fortunate to break even with costs.

A measure known as the hog-corn price ratio is frequently used to indicate how profitable the hog enterprise may be at a given time. (Corn is a major cost item in fattening hogs.) While the exact level varies widely among individual producers, it is traditional that farmers become apprehensive when the price of one hundredweight of pork is equivalent to the price of only 12 bushels of corn. The hog-corn price ratio on a national basis has been at or below the 1-to-12 level since December of last year.

Increased Production as the Major Factor

Much speculation and suspicion generally develops when the bottom appears to fall out of the price of a particular farm commodity. The recent spectacular drop in hog prices has been no exception. Pork imports have been blamed, generally decreased demand for pork has been blamed, and an increase in competition of beef and chickens has also been cited as responsible. In fact, however, the most important determinant would seem to be the 13 percent boost from the year before in numbers of pigs born in 1954 and marketed during the last half of 1954 and the first part of 1955.

The number of spring pigs going to market in the fall of 1954 was about 12 percent greater than the year before. The number of fall pigs ready for this spring's market was nearly 16 percent greater in number than a year ago. The marketing of this enlarged number of pigs was complicated by the fact that farmers, in their attempt to extract the top return for their hogs, altered the marketing pattern to the extent that the tail end of the fall marketing season overlapped the early marketings of the spring season. Thus, instead of having a period of relative shortage and strengthening prices, as would normally occur seasonally, the price downswing already in progress was accentuated.

The sharp boost in production in itself should have been little cause for surprise, as pork production is almost always stepped up when the hog-corn ratio substantially exceeds 1 to 12 during the breeding season. The ratio had ranged from 1 to 15 up to and beyond the extremely favorable level of 1 to 17 during the periods when farmers were making plans which determined the rate of hog marketings in late 1954 and early 1955.

Pork production and prices fluctuate over the years in an observable cycle. Sharply declining hog prices, for example in 1952, were largely responsible for the major retraction in the hog enterprise of that time; the latter, in turn, was responsible ultimately for the very favorable prices which continued to strengthen until early last year. By last spring, however, the favorable prices once again were attracting producers back into heavy production, with the consequent and traditional tendency to overshoot market "needs." Sharply skidding prices experienced in 1954-55 were the result.

Other Factors

Increased imports of pork products have been named by some observers as a significant contributing factor in the hog price decline. The point is open to question, however, when consideration is given to imports of pork products and lard as related to exports of pork and lard, and when these in turn are related to the nation's farm income from the hog enterprise.

Over the period of 1954 when hog prices were declining so rapidly, imports of pork and lard were up by 11 percent from the pre-

vious year. At the same time, however, exports of pork and lard from this country were up by 36 percent. (The increase was due to a 54 percent boost in lard exports.) On balance, imports exceeded exports during this period, both in 1953 and in 1954, but the import excess was reduced by more than one-third in 1954. In addition, when this excess of imports is weighed against the nation's income from hogs, it amounts to only a fraction of one percent—probably less than one-half percent.

Factors stemming from long-run changes in demand probably continued to have some bearing on the slide in hog prices. Poultry supplies have been large in recent years, and during 1954 at least, the price of chicken meat was quite low. Beef also was available in abundant quantities, although at prices not much different from those of the previous year. Over the long pull, the growth in consumption of beef and chicken, when compared with the growth in pork consumption, has been a matter of some concern to observers of the hog market. It is felt by many that a leaner type of pork should be marketed in order to achieve greater appeal to the consumer. In a sense, therefore, the 1954-55 price adjustment in hogs may even have contained some element of secular change in addition to seasonal and cyclical influences.

Note on the Discount Rate

The Board of Directors of the Federal Reserve Bank of Cleveland announced an increase in the discount rate from 1½ percent to 1¾ percent, effective April 15, 1955, on discounts and advances to member banks under Sections 13 and 13a of the Federal Reserve Act. The increase was approved by the Board of Governors of the Federal Reserve System in Washington, D. C. The previous rate of 1½ percent had been in effect since April 23, 1954.

FOURTH FEDERAL RESERVE DISTRICT