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**FEDERAL RESERVE BANK  
OF KANSAS CITY**

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# *Commercial Bank Investments*

## *In Recession and Expansion*

**F**EW INVESTMENT ACTIONS require more attention in analyses of money and capital market developments than those of the Nation's commercial banks. The important role which the commercial banking system plays is only partly explained by the relative size of its security ownership—more than one third of total marketable Federal securities and almost half of the amount held by the public are found in bank portfolios. A more significant characteristic is that bank ownership of securities exhibits pronounced changes over the course of the business cycle, reflecting wide swings in the credit demands of bank loan customers and the effect of monetary policies in alternately expanding and restricting the growth of bank reserves. Transmission to the securities markets of these basic changes in demands for and supplies of funds—and the corollary influence on open-market rates of interest—occurs mainly through adjustments in bank holdings of Treasury issues.

Banks face a wide range of choices in deciding upon the maturity of Treasury securities to be purchased or sold as their total investment portfolios expand and contract over the course of the business cycle. These maturity choices are an important factor determining the cyclical pattern of interest rate movements in the various maturity sectors of the market, if for no other reason than that the scale of bank transactions is so large. Bank investment actions are not the sole influence on the rate level in any given maturity range, but no areas of the maturity scale are fully immune to these actions.

Interest in cyclical changes in the maturity structure of bank investments is stimulated by the relationship of these fluctuations to public policy questions. Much theoretical reasoning concerning credit conditions and economic activity points to the importance of shifts in the yield structure during recession and expansion, or, more specifically, to changes in long-term borrowing costs and in the supply of funds available for long-term investment. The investment decisions of commercial banks are therefore an important determinant of the effects of monetary policy upon economic activity. The topic is equally significant for questions dealing with the changing term structure of the Federal debt. Analysis of the impact of a new Treasury issue on market rates of interest and on the supply of funds available for other investments scarcely can be undertaken without due regard to the investment objectives of the banking system.

The discussion of bank investment transactions in this article is based on cyclical adjustments in commercial bank ownership of Treasury issues from mid-1953 to mid-1958, a period encompassing the two recessions of the 1950's and the major industrial expansion which separated them. During these broad changes in business activity, monetary policy was being employed actively as an instrument of economic stabilization. This period, therefore, provides valuable evidence for appraising the behavior of banks and its implications for the money and capital markets under varying economic and financial conditions.

### **Cyclical Adjustment Patterns—Some Logical Alternatives**

Prior to examining the recent data, it is worthwhile to consider the kinds of changes in the maturity structure of bank-held Treas-

ury issues which might be expected to occur in recession and expansion as a consequence of the pursuit by banks of certain investment policies. Reviewing various hypotheses dealing with this problem helps to establish some standards against which actual experience may be compared and interpreted, and provides a means of judging the extent to which past experience may be indicative of future adjustment patterns.

One view encountered is that cyclical swings in total bank ownership of Government securities primarily will affect bank holdings of short-term issues. The reasoning underlying this position depends upon the fact that banks hold a comparatively large volume of short-term issues in order to permit a liquidation of security holdings with minimal capital losses. Liquidity provisions are at least partly for meeting the requirements encountered in periods of rising customer loan demands, and as these demands expand during economic expansion, short-term issues are sold or redeemed at maturity. When holdings of these liquid instruments have been reduced to minimal levels, liquidation may begin to influence ownership of intermediate- and longer-term issues. The process reduces bank liquidity, however, and the desire to restore liquidity positions tends to channel bank purchases into the short-term sector when total investment holdings subsequently turn upward. Following the restoration of liquidity, further acquisitions may be diverted into securities with longer maturities.

One means of evaluating this hypothesis is to consider other factors influencing bank investment policies as total security ownership expands and contracts. Among these is the desire to maintain a balanced distribution of securities in the various maturity brackets. A staggered, or spaced, term structure of Government security holdings, with perhaps a greater concentration in short-term issues, is one of the devices banks have been known

to employ as a type of protective investment policy. Systematic pursuit of this objective would imply sales from a contracting portfolio (and purchases for an expanding one) spread rather evenly over most of the maturity structure. Purchases of securities in the longest maturity bracket, meanwhile, would be made more or less continuously to compensate for the aging of existing holdings.

Sensitivity to anticipated changes in security prices might generate still different patterns of cyclical adjustment. Banks might be induced to liquidate intermediate- and longer-term obligations in the comparatively early stages of economic expansion, if security prices are expected to decline, rather than to take the risk of having to sell these securities later at substantial losses. Similarly, banks might initially respond to cyclically declining loan demands and expansive monetary policies by acquiring longer-term instruments in anticipation of capital gains, postponing the restoration of liquidity until later. It is not inconceivable that individual banks might cause their intermediate- and longer-term security holdings to bear the brunt of a cyclical change in total investments. Readjustments of portfolio composition in response to an altered term structure of yields also would be conducive to this type of response, since the differential between short- and long-term yields typically widens in recession and narrows in prosperity. It is possible, of course, to recognize different degrees of sensitivity to expected changes in security prices and to alterations in the term structure of yields, and in turn varying degrees of change in the maturity structure of bank ownership.

Manifestly, these influences do not exhaust the considerations governing the desired maturity structure of bank-held securities. They do suffice to indicate, however, that quite different cyclical adjustment patterns are possible. Although short-term securities are held by banks for liquidity reasons, it does not fol-

low that changes in bank investments over the cycle will be confined mainly to these instruments. Alternatives are open to banks in adjusting their security holdings, each of which may be viewed as logical in the judgment of the individual bank. Empirical evidence can supply indications of aggregate responses in past periods; the patterns which emerge, of course, are subject to change as banks review their investment policies in the light of historical experience.

### Recession Experience

The commercial banking system's principal response to declining loan demands and expansive monetary policies during the two recessions of the 1950's was to increase greatly the demands for Government securities with a maturity of more than 5 years. When reserve balances became available for enlarged investments in the latter half of 1953, there followed a remarkable lengthening of bank investment portfolios. Bank ownership of marketable Treasury issues maturing in 5 to 10 years rose nearly \$14 billion between mid-1953 and the end of 1954. An additional \$0.8 billion was acquired in

### Commercial Bank Investments in Treasury Securities Lengthened in Maturity as They Expanded During 1953-54.

Table 1.

| Marketable Treasury Securities Maturing in: | Total Publicly Owned |          | Held by all Commercial Banks |          | Commercial Bank Share of the Total |          |
|---|----------------------|----------|------------------------------|----------|------------------------------------|----------|
|   | June '53             | Dec. '54 | June '53                     | Dec. '54 | June '53                           | Dec. '54 |
|   | (Billions)           |          |                              |          | (Per Cent)                         |          |
| Less than 1 year                            | \$ 48.9              | \$ 43.3  | \$22.2                       | \$17.8   | 45                                 | 41       |
| 1-5 years                                   | 25.7                 | 26.4     | 20.2                         | 20.6     | 78                                 | 78       |
| 5-10 years                                  | 16.9                 | 32.2     | 9.1                          | 22.7     | 54                                 | 70       |
| More than 10 years                          | 27.6                 | 27.5     | 4.7                          | 5.5      | 17                                 | 20       |
| All securities                              | \$119.1              | \$129.4  | \$56.2                       | \$66.6   | 47                                 | 51       |

NOTE: Details may not add to totals because of rounding. Data are for end of month.

SOURCE: *Treasury Bulletin*, together with estimates by the Board of Governors of the Federal Reserve System for banks other than those reporting in the Treasury Survey of Ownership.

issues due in more than 10 years, while holdings of very short-term issues — those maturing in a year or less — were reduced by over \$4 billion. Little change was observed in the 1- to 5-year maturities. The average maturity of bank-held marketable Treasury issues increased by about 1 $\frac{1}{3}$  years in that 18-month period, with all of the increase occurring in calendar 1954. In the latter half of 1953, short- as well as longer-term securities were acquired by banks, as outstanding issues in the less-than-1-year range increased sharply.

In Table 1, bank ownership of securities in the various maturity brackets is compared with the amounts held by the public (total marketable Treasury securities outstanding less issues held by the Federal Reserve banks and the U. S. Government Investment Accounts) on June 30, 1953, and December 31, 1954. It may be noted that the decline in bank ownership of issues maturing within a year accounted for most of the \$5.6 billion reduction in publicly held securities in this range. Consequently, the percentage of these publicly held short-term securities found in the banking system declined from 45 to 41. In the over-5-year groups, the bank percentage increased significantly — from 54 to 70 in the 5- to 10-year bracket, and from 17 to 20 in the over-10-year range.

A similar, but less drastic, lengthening of maturities occurred with the expansion in bank ownership which began in July 1957. In the following year, commercial banks added \$9 billion to their portfolios of marketable Treasury issues. Of this increase, \$6.5 billion took place in securities due in 5 to 10 years, and \$1.0 billion was in issues with more than 10 years to maturity. In this instance, however, there was no decline in ownership of short-term obligations. A moderate increase was registered in the less-than-1-year range and also in the 1- to 5-year maturities. Consequently, lengthening of the average life of bank-held Treasury issues, a change of about

*. . . A Lengthening of Maturities Also Accompanied the Expansion in Bank Holdings From June 1957 to June 1958.*

Table 2.

| Marketable Treasury Securities Maturing in: | Total Publicly Owned |          | Held by all Commercial Banks |          | Commercial Bank Share of the Total |          |
|---|----------------------|----------|------------------------------|----------|------------------------------------|----------|
|   | June '57             | June '58 | June '57                     | June '58 | June '57                           | June '58 |
|   | (Billions)           |          |                              |          | (Per Cent)                         |          |
| Less than 1 year                            | \$ 49.6              | \$ 43.9  | \$14.6                       | \$15.4   | 29                                 | 35       |
| 1-5 years                                   | 37.3                 | 38.5     | 26.0                         | 26.9     | 70                                 | 70       |
| 5-10 years                                  | 13.7                 | 22.0     | 9.4                          | 15.9     | 69                                 | 72       |
| More than 10 years                          | 26.6                 | 30.2     | 4.4                          | 5.4      | 16                                 | 18       |
| All securities                              | \$127.2              | \$134.6  | \$54.5                       | \$63.5   | 43                                 | 47       |

NOTE: Details may not add to totals because of rounding. Data are for end of month.

SOURCE: *Treasury Bulletin*, together with estimates by the Board of Governors of the Federal Reserve System for banks other than those reporting in the Treasury Survey of Ownership.

one half year, was considerably less than in the 1953-54 recession.

As in the earlier recession period, maturity lengthening by banks resulted in a rise in their share of publicly held longer-term securities — from 69 to 72 per cent in the 5- to 10-year range, and from 16 to 18 per cent in issues with more than 10 years to maturity. These increases were smaller than in the 1953-54 period. A more striking contrast with that earlier period is in the differing behavior of ownership in the less-than-1-year range. In this maturity group, outstanding issues held by the public declined \$5.7 billion, but commercial bank holdings rose \$0.8 billion. Their share of the total advanced from 29 to 35 per cent, in comparison with a decline between June 1953 and December 1954.

The exceptionally large dollar increases in ownership of issues maturing in more than 5 years during the two recession periods of the 1950's obviously reflect new offerings of longer-term Treasury issues. Nevertheless, the rise in the bank-held proportion of total publicly owned longer-term securities indicates a genuine desire among banks to lengthen the maturity of investment portfolios. Without the

presence of this objective, bank ownership in relation to outstandings would have been expected to decline. This conclusion is supported by the knowledge that banks were acquiring longer-term issues through market purchases as well as through participation in new Treasury offerings. From June 1953 to December 1954, commercial banks which report monthly in the Treasury Survey of Ownership (a group which holds about 90 per cent of the Federal issues owned by the banking system) effected market purchases of an estimated \$2.7 billion in securities maturing in more than 5 years. About \$2 billion of these were in the 5- to 10-year range. From June 30, 1957, to June 30, 1958, market purchases of these banks included an estimated \$0.4 billion in 5- to 10-year issues, and \$0.2 billion in the more-than-10-year sector, all of which were acquired in the final three quarters of the 12-month period.

The less aggressive pursuit of maturity-lengthening objectives in the second recession period was conditioned by the less liquid position of the banking system at the onset of the downswing. On June 30, 1953, the volume of Federal securities due to mature within a year held by banks reporting in the Treasury Survey comprised approximately 40 per cent of their total ownership of marketable Government obligations, and issues maturing in 1 to 2 years accounted for another 20 per cent. Ownership of short-term instruments was much smaller at mid-1957, when holdings of issues due within a year were one third less than in 1953, and issues in the 1- to 2-year range were about half the figure of 3 years earlier. The ratio of loans to deposits in the banking system also was substantially higher in June 1957. Quite probably, the aggregate figures mask a more stringent liquidity problem facing some individual banks at mid-1957, the solution of which required acquisitions of short-term issues. The liquidity problem, however, did not prevent the banking system as a

whole from moving quickly into longer-term instruments in 1957 when a shift in monetary policy was signaled by a reduction in Reserve bank discount rates in November.

#### Experience During Economic Expansion

Separating these two periods of growth and maturity-lengthening of bank portfolios was a 2½ year interval in which bank ownership of Treasury issues contracted severely, evidencing the pressure of greatly increased loan demands and the restrictive influence of monetary policy. The commercial banking system relinquished about \$12 billion in marketable Treasury obligations between December 1954 and June 1957 — nearly one fifth of the total held on the earlier date.

In the first half of this 2½ year interval—from December 1954 to the end of March 1956 — the reduction in bank ownership of short-term securities was unusually heavy, amounting to nearly \$11 billion. This was only partly a reflection of the reduction in the publicly held supply of these issues, which amounted to \$6 billion. A large quantity of short-term issues was finding its way into the hands of nonbank investors, and the commercial bank share of publicly held issues in the 1-year range declined strikingly, from over 40 per cent to less than 20 per cent.

The behavior of short-term holdings between March 1956 and June 1957 stands in marked contrast to developments in the previous 15 months. Bank ownership of less-than-1-year issues began expanding in the second quarter of 1956 to record an increase of almost \$8 billion by June 1957, and the commercial bank share of the publicly held total rose to 29 per cent. Short-term issues held by public nonbank investors continued to rise in absolute amounts, however, as the supply available to the public increased \$12 billion.

Changes in bank ownership of intermediate- and longer-term securities during the 1955-57 boom are not clearly perceived in the absolute levels of their holdings as presented in Table 3, since a major factor producing change in each maturity group was the movement of securities to lower age brackets with the passage of time. Few new securities of longer maturity were being added to bank portfolios during this period, and the average life of bank-held obligations was shortening persistently between December 1954 and June 1957. The decline in average maturity was almost a full year, and occurred mainly in the latter half of the period.

Estimated market transactions in securities by banks reporting monthly to the Treasury indicate a large volume of sales of issues in

#### ... Aging of Longer-Term Issues and Sales of Intermediate-Term Securities Shortened The Average Life of Bank Investments During the Boom.

Table 3.

| Marketable Treasury Securities Maturing in: | Total Publicly Owned |          |          | Held by all Commercial Banks |          |          | Commercial Bank Share of the Total |          |          |
|---|----------------------|----------|----------|------------------------------|----------|----------|------------------------------------|----------|----------|
|   | Dec. '54             | Mar. '56 | June '57 | Dec. '54                     | Mar. '56 | June '57 | Dec. '54                           | Mar. '56 | June '57 |
|   | (Billions)           |          |          |                              |          |          | (Per Cent)                         |          |          |
| Less than 1 year                            | \$ 43.3              | \$ 37.3  | \$ 49.6  | \$17.8                       | \$ 6.9   | \$14.6   | 41                                 | 18       | 29       |
| 1-5 years                                   | 26.4                 | 35.5     | 37.3     | 20.6                         | 23.6     | 26.0     | 78                                 | 66       | 70       |
| 5-10 years                                  | 32.2                 | 29.9     | 13.7     | 22.7                         | 20.6     | 9.4      | 70                                 | 69       | 69       |
| More than 10 years                          | 27.5                 | 28.5     | 26.7     | 5.5                          | 4.9      | 4.4      | 20                                 | 17       | 16       |
| All securities                              | \$129.4              | \$131.3  | \$127.2  | \$66.6                       | \$56.0   | \$54.5   | 51                                 | 43       | 43       |

NOTE: Details may not add to totals because of rounding. Data are for end of month.

SOURCE: *Treasury Bulletin*, together with estimates by the Board of Governors of the Federal Reserve System for banks other than those reporting in the Treasury Survey of Ownership.



## Commercial Bank Investments

the 1- to 5-year range. The \$4.9 billion sold by this group of banks over the 2½ years were spread over the entire maturity bracket. These sales may represent transactions by banks whose ownership of very short-term issues had been exhausted, or they may partly reflect switches to avoid capital losses in a declining market. The timing of the sales suggests that the former may have been an important element; a major portion took place after mid-1955, by which time many individual banks virtually had emptied their portfolios of bills, certificates, and near-term notes and bonds.

Market transactions by this group of banks in securities due in more than 5 years were quite moderate, as a small volume of sales in the 5- to 10-year range were a bit more than counterbalanced by acquisitions in the over-10-year group — chiefly issues maturing within 15 years. Thus, there is no evidence of a significant volume of switches from longer-term to short-term obligations which could be interpreted as a response to expected declines in bond prices. Yet, it is clear that the appetite for longer-term securities present in the two recession periods was conspicuously absent during the intervening years of economic expansion. Not until reserve positions were eased and bank ownership of Treasury issues turned upward did the commercial banks

begin to make adjustments for the gradual decline in the average maturity of their holdings.

### Cyclical Change in Demands for Intermediate- and Longer-Term Securities

The preceding review of changes in the maturity distribution of bank-held securities from mid-1953 to mid-1958 gives evidence of a strong cyclical component in bank demand for intermediate- and longer-term securities. Providing quantitative dimensions to the variation in demand is difficult, for as indicated earlier, the large acquisitions of longer-term investments by banks coincided with periods of new Treasury offerings. The dollar volume of these securities acquired in the two recession periods clearly would have been substantially less in the absence of an expanded supply.

Examination of market transactions in longer-term instruments by banks reporting in the Treasury Survey of Ownership indicates that the extent of cyclical change is sizable, however. Market purchases of issues due in more than 5 years were at annual rates of \$1.8 billion from mid-1953 to December 1954; \$0.1 billion from December 1954 to June 1957; and \$0.6 billion from June 1957 to June 1958. In the last period, purchases in the final three quarters were at an annual rate of \$0.9 billion. Supplementing these cyclical swings were parallel fluctuations in bank ownership of securities other than Treasury issues. Holdings of "other securities" by all commercial banks rose at an annual rate of \$1.4 billion from June 1953 to December 1954; \$0.1 billion from December 1954 to June 1957; and \$3.3 billion in the year ending June 1958.

In the area of intermediate-term issues — securities in the 1- to 5-year range — cyclical changes are also observable in the market transactions of banks reporting in the Treasury Ownership Survey. The period from mid-1953 to December 1954 witnessed net market

### Estimated Market Transactions in Intermediate- and Longer-Term Securities.

Table 4.

Commercial Banks Reporting in the Treasury  
Survey of Ownership  
In billions

| Securities Maturing in: | December 1954-<br>March 1956 | March 1956-<br>June 1957 |
|-------------------------|------------------------------|--------------------------|
| 1-5 years               | \$-3.5                       | \$-1.4                   |
| 5-10 years              | -0.4                         | *                        |
| More than 10 years      | +0.2                         | +0.3                     |

\*Less than \$0.05 billion.

SOURCE: *Treasury Bulletin* for ownership statistics. Estimates of market transactions by the Federal Reserve Bank of Kansas City.



sales at an annual rate of about \$0.5 billion, but this rate was stepped up to \$1.9 billion from December 1954 to June 1957. Beginning in the fourth quarter of 1957 and continuing through June 1958, net market purchases were made at an annual rate of \$1.3 billion.

The magnitude of these changes in transactions involving intermediate- and longer-term Treasury issues and in other securities indicates that the investment decisions of banks affect importantly the terms on which funds can be borrowed in the Nation's capital markets. Sizable quantities of funds were placed in the capital markets by banks during the two recession periods, directly through purchases of non-Treasury issues and indirectly through acquiring Federal obligations from nonbank holders, but this source of funds was withdrawn in the boom of 1955-57.

The initial impact of this changing supply of funds on market rates of interest may be felt primarily in the range of maturities up to 10 years. The cyclical component of market transactions in Treasury issues is confined mainly to issues due in 10 years or less, and acquisitions of other investments by commercial banks—principally municipal securities—usually are thought to be limited to the shorter maturities of serial issues. But securities ranging up to 10 years in maturity are sufficiently close substitutes for instruments of longer maturity, in the portfolios of permanent investors, to warrant the assumption that yield changes in this maturity sector are at least partly transmitted to even the very distant end of the maturity spectrum. That the transmission may be only partial, however, is suggested by the “hump” in the yield curve from about mid-1956 until late in 1957. Reflecting the pressure of sales by banks as well as other investors, yields on Government obligations maturing in approximately 2 to 7 years were above those on outstanding issues in the more distant maturities, as well as above the rates on shorter-term instruments.

### The Changing Pattern of Short-Term Holdings

An identifiable cyclical pattern of change in bank ownership of very short-term issues, on the other hand, is much less evident. During the expansion phase of the business cycle, when commercial banks were liquidating securities to meet customer loan demands, a substantial reduction did occur during 1955 and the first quarter of 1956 in bank ownership of Treasury issues due within a year. The resulting transfer of short-term issues to nonbank investors in this period evidently was an important factor in the upward movement of interest rates on short-term, open-market instruments. Subsequently, however, bank holdings of issues due in 1 year rose markedly with the increased supply of securities outstanding in this range. While the bank share of publicly held short-term issues advanced between March 1956 and June 1957, the absolute volume in the hands of the nonbanking public also increased. Thus, it is difficult to segregate the influence of bank activities on short-term rates from that exerted by the expanded supply of short-term issues in the latter half of the expansion period.

Changes in bank ownership of short-term issues in the recent recession contrasted sharply with those occurring in the post-Korean dip. As noted earlier, the differing behavior seems partly to have been explained by the reduced liquidity of the banking system at the onset of the more recent slide in economic activity. The consequence was a much stronger bank influence in depressing short-term rates late in 1957 and in early 1958 than was exerted by the commercial banking system in 1953 and 1954. In both periods, however, a contracting volume of short-term securities outstanding, as well as a growth in nonbank demand for short-term investments accompanying the build-up of business liquidity, were important to the descent of short-term rates.

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in MEAT

CONSUMER DEMAND for meat has tended to change in a gradual and routine manner, while per capita meat supplies have fluctuated cyclically. The impact of these variable supplies on a market with a routine demand has caused instability of meat and meat animal prices.

This topic is of particular interest currently because favorable feeding ratios in recent months have encouraged producers to expand production cyclically again. Continuation of current rates of expansion are likely to cause sharply increased per capita supplies of meat and lower meat animal prices when these cyclically increased supplies hit the market. Assuming that a close relationship has prevailed between the changing supplies and prices during the period since World War II, familiarity with such a relationship would be helpful in efforts to evaluate the meat situation during the prevailing phase of the meat cycle. An effort will be made to point out some of the significant aspects of demand for meat and to show the relationship between changing supplies and prices in the actual economy as it has existed during the postwar period.

### **Demand for Meat**

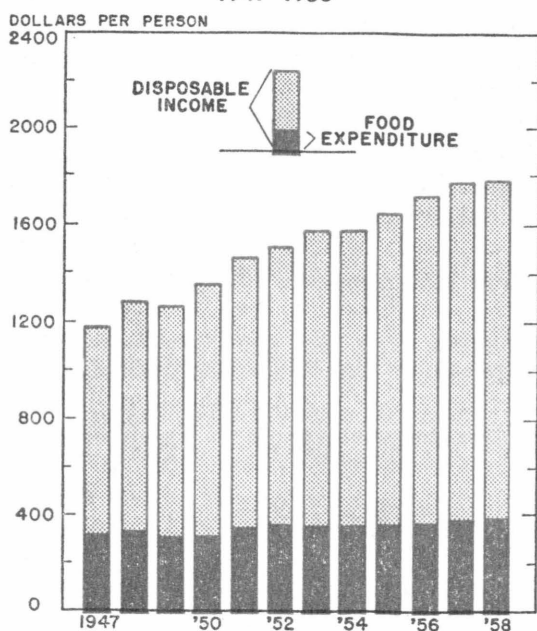
To trace the relationship between variability in per capita supplies of meat and prices, it is necessary to understand clearly what assumptions have been made pertaining to demand. If price variability from year to year could be traced clearly to a rapidly changing and highly variable demand for meat, com-

parisons of variability in supplies and prices would not be appropriate.

For purposes of this analysis, it will be assumed that the demand for meat has remained high and that any changes have occurred in a gradual and routine manner. Although no effort will be made to derive demand curves for meat, both empirical evidence and review of the literature indicate that the above assumptions are reasonably realistic. Therefore, comparisons between the year-to-year rate of change in per capita supplies of meat and meat animal prices should be helpful in analyzing the future outlook for meat animal producers.

Prior to the beginning of World War II, a close relationship existed between the retail value of meat consumed and consumer incomes. During the war years, rationing and price ceilings caused the retail value of meat consumed to lag substantially behind consumer incomes as these incomes increased sharply. With removal of rationing and price ceilings, the retail value of meat consumption jumped rapidly and approached prewar relationships with consumer incomes during the late 1940's. Since that time, the retail value of meat sales has increased, but at a substantially less rapid rate than have consumer incomes. This probably is explained by the fact that consumers increase per capita consumption of meat more slowly when their incomes increase from higher levels than they do when their incomes increase from lower levels. In other words, the income elasticity for meat is

### PER CAPITA DISPOSABLE PERSONAL INCOME AND FOOD EXPENDITURES 1947-1958



SOURCE: Agricultural Marketing Service, U. S. Department of Agriculture.

less at higher levels of income than at lower levels of income. Studies on this topic lend credence to this assumption.

Per capita disposable personal income increased by approximately one half from 1947 to 1958. Food expenditures, measured on a per capita basis, increased only about a fourth during the same period of time. These data verify that food expenditures during the post-World War II period changed at a much less rapid rate than did income. The less rapid rate of change in food expenditures indicates a relatively low income elasticity for food expenditures at the income levels that prevailed during this period.

Furthermore, a significant part of the increased expenditure for food during this pe-

riod is accounted for by such factors as substitution of purchased foods for home-produced foods, increased cost of food expenditures because of a larger proportion of meals being eaten away from home, and the substitution of convenience foods for less processed foods. Insofar as these factors account for the increased food expenditures, the additional dollars spent for food would not necessarily be reflected back to an increased demand for food at the farm level. In fact, the Agricultural Marketing Service has estimated that the actual per capita consumption of food has increased only about 3 per cent during the past decade. This increase reflects an expansion in quantity consumed and the substitution of more expensive for less expensive foods. Although the income elasticity for meat as a whole may have differed from that for all food, it is highly probable that any differences were relatively minor. Furthermore, where significant differences for certain meats—such as beef—did exist, year-to-year changes probably were routine in nature and did not result in wide variability in demand from year to year.

If the stage in economic growth has been achieved where consumer incomes are sufficiently high so the income elasticity of meat is low, this fact is of substantial importance to the meat animal industry. Such a situation would mean that demand for meat would not be influenced as greatly by moderate changes in economic activity as during earlier periods. Under these circumstances, demand for meat in the future would tend to be more stable and more closely tied to population growth. Furthermore, increasing per capita demand for meat would continue to occur slowly and in a routine fashion with rising per capita income. If these assumptions are accurate, they emphasize the importance to producers of closely observing cyclical changes in meat production. Insofar as it is possible for them to do so, producers will find it advantageous

to plan their production programs on the basis of a demand determined by population growth, plus a small additional increase for the routine change in per capita consumption that is likely to occur because of economic growth.

A study by Rex F. Daley on "The Long-Run Demand for Farm Products," published in the July 1956 issue of *Agricultural Economics Research*, tends to confirm such an analysis. He concludes that growth in demand for farm products during the next quarter of a century will depend primarily on growth in population and consumer income—with most of the increase being attributed to population growth. It is estimated in this study that with an approximate doubling in the size of the gross national product and the resultant rising consumer incomes, total consumption of farm products will increase about 40 to 45 per cent. Per capita consumption is expected to increase only around 10 per cent.

Karl A. Fox, in an analysis of demand for farm products published in the August 1955 issue of the *Journal of Farm Economics*, states: "It is obvious that the world of 1955 is not the world of 1940; and yet I believe many of us have been over impressed by the novel elements in the postwar situation and have underestimated the continuity of mass economic behaviour . . . If other people are like ourselves, it seems reasonable to believe that the structure of demand for farm products has undergone a gradual evolution rather than a dramatic upheaval."

Other studies and analyses could be cited to verify the appropriateness of assuming a gradual evolution in demand for meat and other agricultural products. They also would indicate that in most instances the assumption of gradual change in demand is realistic, so a comparison of year-to-year changes in meat supplies and meat and meat animal prices during the post-World War II period should reveal some useful relationships.

#### Relationship Between Variability in Supplies and Prices

Per capita supplies of red meats, as measured by per capita consumption, have varied substantially during the past decade. In 1951, per capita consumption was at a post-World War II low of 138 pounds, but by 1956, it was at a record high of 167 pounds—an increase of 21 per cent within a 4-year period. With the exception of 1950 and 1954, significant changes in per capita consumption of red meats from the preceding year have occurred each year since the end of World War II. Furthermore, average prices have shown significant inverse changes with changing supplies as measured by per capita consumption.

For analytical purposes, comparisons of changes were made between: (1) per capita red meat consumption and retail prices of red meats on both an actual and deflated basis; (2) per capita consumption of beef and prices received by farmers for beef cattle; (3) per capita consumption of pork and prices received by farmers for hogs; and (4) per capita consumption of lamb and mutton and prices received by farmers for lambs. In all cases, these comparisons were made in terms of per cent change in annual per capita consumption from the preceding year as related to per cent change in average annual price from the preceding year. For example, in 1948, per capita consumption of red meats was 6.4 per cent lower and retail meat prices 13.7 per cent higher than 1947 levels.

Plotting these per cent changes for annual per capita consumption with the comparable changes in retail meat prices indicates that the relationship was inverse and close. The chart on page 14 indicates by the slope of the line that, as total meat supplies changed enough to cause a 1 per cent change in the annual per capita consumption of red meats, on an average the price changed almost  $1\frac{2}{3}$  per cent in the opposite direction. Thus, if demand changes were routine, it is apparent

that changing supplies, as measured by per capita consumption, have had a dominant influence on meat prices during the post-World War II period.<sup>1</sup>

The demand for beef cattle is derived largely from the demand for beef. Therefore, prices received by farmers for beef cattle would be expected to be closely associated with beef prices and, thus, to be influenced by changing supplies of beef. As indicated on the accompanying chart, the relationship between changing beef supplies as measured by the per cent change in annual per capita consumption of beef and prices received by farmers for beef cattle was inverse and more closely related than changing per capita supplies of all red meats consumed were to the changing retail price of all red meats.

The data indicate that, on an average during the postwar period, for each change in total supplies of beef large enough to cause a 1 per cent change in annual per capita beef consumption there was an average inverse change of about  $1\frac{3}{4}$  per cent in the price received by farmers for beef cattle. Thus, beef cattle prices changed more than did per capita consumption of beef.

The demand for hogs also is a derived demand. It is derived from the demand for pork

and lard. Slope of the line on the chart indicates that, on an average, hog prices changed inversely about 2 per cent for each change in total pork supplies of sufficient magnitude to cause a 1 per cent change in the annual per capita consumption of pork. Thus, hog prices were influenced even more by changing supplies of pork than beef cattle prices were influenced by changing supplies of beef.

The relationship between prices received by farmers for lambs and changing supplies of lamb and mutton as measured by per capita consumption also was inverse. However, prices received for lambs were influenced less on an average by changing supplies of lamb and mutton than cattle and hog prices were by changing supplies of beef and pork. On an average, lamb prices changed about 1 per cent for each 1 per cent fluctuation in per capita supplies as measured by per capita consumption.

### Epilogue

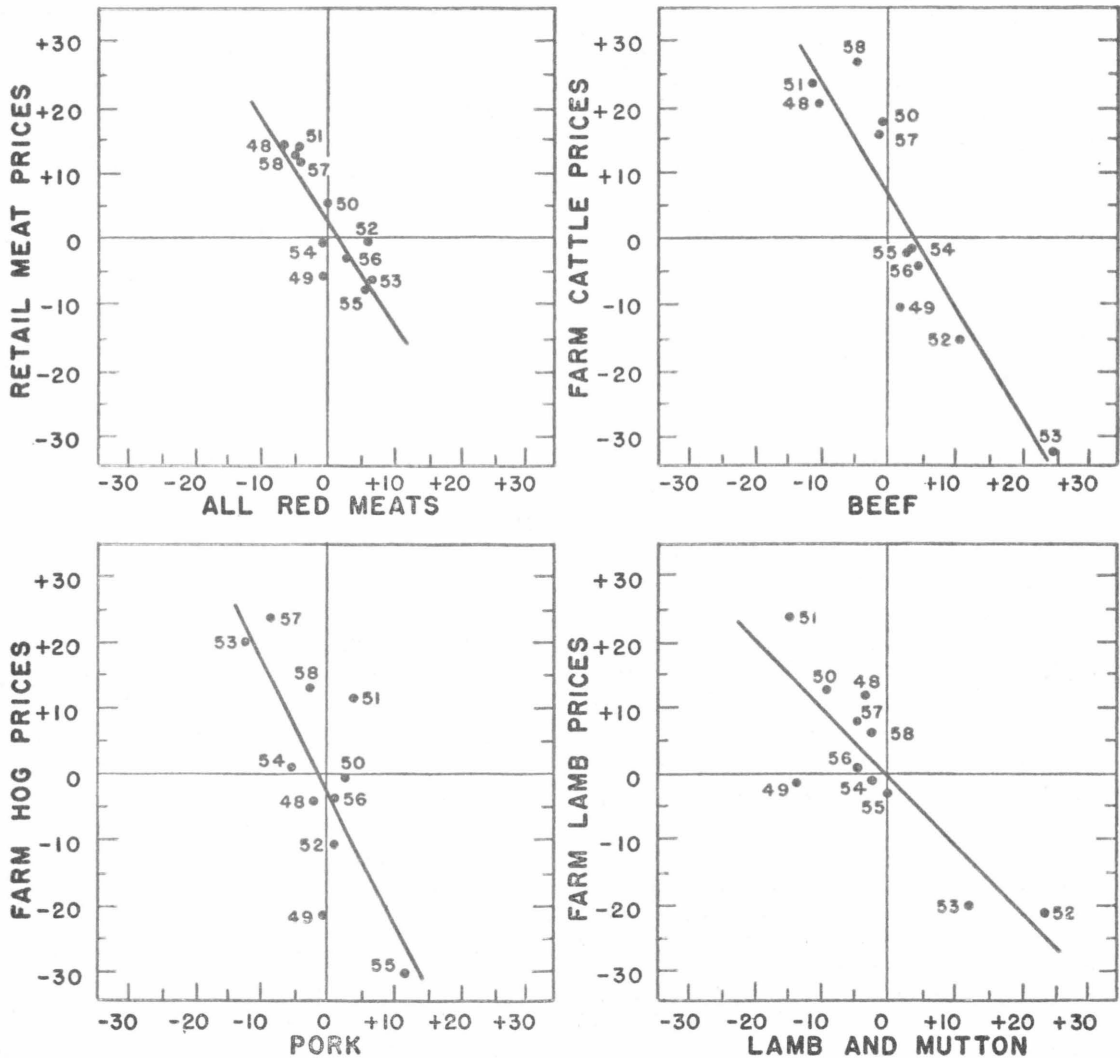
Available evidence indicates that demand for meat in recent years has remained strong and that any changes that occurred took place in a routine manner. Empirical analysis also verifies that a close inverse relationship has prevailed between changing meat and meat animal prices and fluctuating per capita consumption. These factors are of particular interest currently because all indicators point toward a rapid cyclical increase in meat production. It is almost certain that per capita supplies of meat are now increasing and the increase may be sharp. The major factors to observe in viewing the outlook for meat animals in the current expansionary phase of the meat cycle are: (1) amount of expansion; (2) timing of the expansion; and (3) the effect that increasing per capita supplies will have on prices.

Several reports that have been released recently are helpful in attempts to analyze the amount and timing of the current cyclical

<sup>1</sup> For the more technical reader, the regression curve had a slope of  $-1.62$  and the correlation coefficient was  $-.87$  if raw data were used for computing the per cent change from year to year. If retail meat prices were deflated for price level changes, the slope of the regression curve became  $-.91$  (much more elastic), but the correlation coefficient remained  $-.87$ . For purposes of this article, it was decided to make the analysis with use of raw rather than deflated data.

The regression line for beef had a slope of  $-1.73$  with a correlation coefficient of  $-.91$ . For pork, the regression line had a slope of  $-1.97$  and a correlation coefficient of  $-.75$ ; while for lamb and mutton, the figures were  $-1.03$  and  $-.85$ , respectively.

RELATIONSHIP BETWEEN PER CENT CHANGE IN ANNUAL PRICES AND  
PER CAPITA CONSUMPTION  
1947-1958



expansion. The U. S. Department of Agriculture's December *Pig Crop Report* indicated that the Nation's farmers produced 42.5 million pigs last fall, which was 17 per cent more than were produced in the fall of 1957. Furthermore, farmers indicated in the report that they intended to produce 59 million head of

pigs this spring, which would be 13 per cent above year-earlier levels. With these estimates of last fall's and this spring's pig crops, it is possible to make a reasonably good projection of pork production for 1959, since most of the pork produced this year will come from these pig crops.

The total of 101.5 million pigs produced in these two crops is 15 per cent more than were produced in the comparable year-earlier crops, most of which were slaughtered in 1958. Thus, it appears that about 15 per cent more pigs will be available for slaughter in 1959. If slaughter weights are maintained at about 1958 levels, which now seems to be a reasonable assumption, total pork production this year could be up about 15 per cent from 1958 levels. Population growth would result in a less rapid increase of about 12 per cent in per capita supplies of pork.

The *Livestock Inventory* report released by the U. S. Department of Agriculture in mid-February also confirms the analysis based on the December *Pig Crop Report*. The number of hogs on farms on January 1, 1959, according to the inventory, was 57,201,000 head, or 12 per cent more than a year earlier. It is this large anticipated increase in per capita supplies of pork in 1959 that is providing the basis for the lower hog price forecasts. If the current hog cycle follows a normal pattern, per capita pork supplies would be expected to remain large in 1960 and commence to decline by 1961 or 1962.

Beef production also is being expanded at a relatively rapid rate at present. Reduced levels of slaughter during 1958 enabled the Nation's farmers to increase cattle numbers by 3,501,000 head during the year. Thus, cattle numbers on January 1, 1959, were at a new record high of 96,851,000 head, which was only slightly above the previous record high, but 4 per cent above the January 1, 1958, number. The pattern followed by previous cattle cycles and the current feed and range situation indicate that farmers will continue to increase numbers this year at about the 1958 rate. If they do, withholding of cattle from slaughter can be expected to hold per capita supplies of beef at near 1958 levels.

Per capita supplies of beef normally would have dropped more sharply during the cur-

rent phase of the beef cattle cycle, but increased feeding has maintained supplies at high levels despite the withholding of cattle from slaughter. Slaughter of fewer calves and increased feeding is causing the average slaughter weight per animal to be substantially higher than in previous comparable phases of the cycle. Thus, it now appears most realistic to assume that numbers will continue to be expanded at a rather high rate in 1959, and that the cycle may peak sometime in the 1960-62 period. Despite heavy withholdings from slaughter during 1959, per capita beef consumption will remain higher than in previous cycles because of the small decline in numbers from the peak of the previous cycle and the heavier slaughter weights. With average weather conditions, beef supplies can be expected to commence increasing sharply sometime during the 1960-62 period.

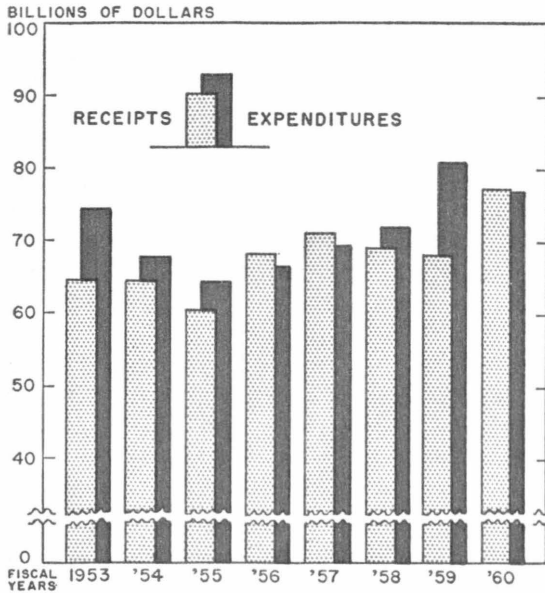
Sheep and lamb numbers have been at extremely low levels since 1950. Consequently, per capita supplies of lamb have been small. Favorable feed and range conditions caused farmers to increase numbers by 4 per cent during 1958, and it appears that numbers will be increased more this year. However, because of the small per capita consumption of lamb and mutton, relatively large changes can be made in numbers without having much influence on total red meat supplies.

Thus, per capita supplies of all the red meats are expected to increase over the next several years. During the period since the end of World War II, for each change in supplies of beef large enough to cause a 1 per cent change in annual per capita consumption, cattle prices changed inversely an average of about  $1\frac{3}{4}$  per cent; for similar changes in pork supplies, hog prices changed inversely by about 2 per cent; while changes of this magnitude in lamb and mutton supplies were associated with an average inverse change of 1 per cent in lamb prices.

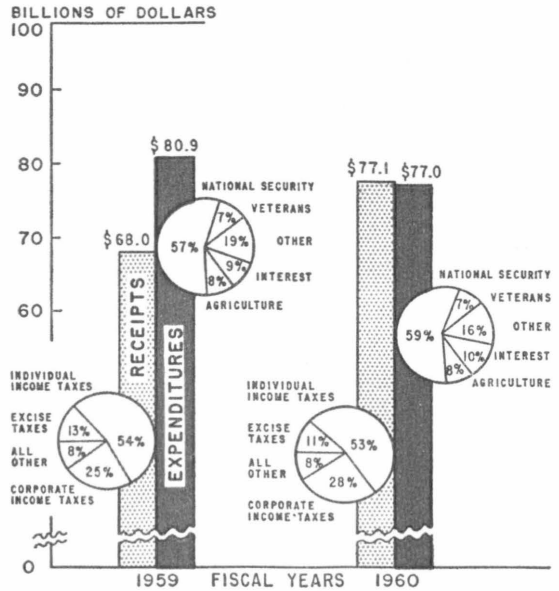


# THE FEDERAL BUDGET

## Recent Totals



## Distribution of Receipts and Expenditures



NOTE: Fiscal years 1959 and 1960 are estimates from *Budget Message of the President, January 1959.*

## BANKING IN THE TENTH DISTRICT

| District and States | Loans                     |           |                      |           | Deposits                  |           |                      |           |
|---------------------|---------------------------|-----------|----------------------|-----------|---------------------------|-----------|----------------------|-----------|
|                     | Reserve City Member Banks |           | Country Member Banks |           | Reserve City Member Banks |           | Country Member Banks |           |
|                     | Dec. 1958                 | Jan. 1959 | Dec. 1958            | Jan. 1959 | Dec. 1958                 | Jan. 1959 | Dec. 1958            | Jan. 1959 |
| Tenth F. R. Dist.   | -2                        | +10       | +10                  | +17       | -6                        | +9        | †                    | +12       |
| Colorado            | -1                        | +15       | +1                   | +18       | -3                        | +12       | †                    | +12       |
| Kansas              | †                         | +11       | +2                   | +21       | -1                        | +9        | +2                   | +12       |
| Missouri*           | †                         | +7        | -1                   | +9        | -4                        | +7        | -1                   | +12       |
| Nebraska            | -4                        | +13       | †                    | +19       | -8                        | +13       | +1                   | +14       |
| New Mexico*         | **                        | **        | -7                   | +16       | **                        | **        | †                    | +17       |
| Oklahoma*           | -5                        | +5        | +5                   | +17       | -13                       | +6        | -1                   | +10       |
| Wyoming             | **                        | **        | +2                   | +14       | **                        | **        | -1                   | +13       |

\*Tenth District portion only. \*\*No reserve cities in this state.  
†Less than 0.5 per cent.

## PRICE INDEXES, UNITED STATES

| Index                                 | Jan. 1959 | Dec. 1958 | Jan. 1958 |
|---------------------------------------|-----------|-----------|-----------|
| Consumer Price Index (1947-49=100)    | 123.8     | 123.7     | 122.3     |
| Wholesale Price Index (1947-49=100)   | 119.5     | 119.2     | 118.9r    |
| Prices Rec'd by Farmers (1910-14=100) | 244       | 244r      | 241r      |
| Prices Paid by Farmers (1910-14=100)  | 298       | 295r      | 290r      |

r Revised.

## TENTH DISTRICT BUSINESS INDICATORS

| District and Principal Metropolitan Areas | Value of Check Payments          | Value of Department Store Sales |
|---|----------------------------------|---------------------------------|
|   | Percentage change—1959 from 1958 |                                 |
|   | Jan.                             | Jan.                            |
| Tenth F. R. Dist.                         | +7                               | +9                              |
| Denver                                    | +9                               | +9                              |
| Wichita                                   | 0                                | +4                              |
| Kansas City                               | +6                               | +10                             |
| Omaha                                     | +12                              | +6                              |
| Okla. City                                | 0                                | +12                             |
| Tulsa                                     | -2                               | +6                              |