MONTHLY
Business Review

FINANCE • INDUSTRY • AGRICULTURE • TRADE

FOURTH FEDERAL RESERVE DISTRICT

Vol. 34—No. 9 Federal Reserve Bank of Cleveland Cleveland 1, Ohio

SEPTEMBER 1952

CONTENTS

The National Product Before and After Korea

SUFFICIENT time has now elapsed since the outbreak of the Korean war to yield a fair perspective on the principal ways in which the nation's pattern of economic activity has changed. The period from mid-1950 through the second calendar quarter of 1952 — the latest for which data on national product are available at this time—embraces eight calendar quarters, or the equivalent of two full years.

Such a "post-Korean" period takes its place as the second broad phase of the seven-year span since the end of World War II, including an almost unbroken continuity of brisk economic activity in the aggregate. For convenience, the first postwar phase is designated as "pre-Korean" (from 1946 through the 2nd quarter of 1950) as distinguished from the second or post-Korean phase (from the 3rd quarter of 1950 to the present).

To discern similarities as well as differences in the composition of the national product in the two periods thus defined is the central aim of the article which follows. For this purpose examination is made of the total, as well as the makeup, of the statistical measure known as the Gross National Product or Expenditure, or GNP for short.

Movement of the National Product and Its Parts

The first chart of the series shown on page 4 depicts the course of the Gross National Product, as well as a number of its more important constituents, from the first quarter of 1946 through the second quarter of 1952. Looking first at the total, without reference to the parts, it is clear that: (a) GNP has risen during the entire period except for the year 1949, during which it sagged moderately, and (b) the rise in total GNP was accelerated in the early stages of what is called here the post-Korean period, especially during the last half of 1950 and the early part of 1951.

Before proceeding from the total to the parts of GNP, it should be noted that all figures shown on the charts are in current dollars, with no correction for price changes. That is the way in which GNP is compiled and ordinarily published. The question springs to mind, however, whether gains in GNP are illusory, reflecting merely the effects of price increase. The answer is that gains in GNP have been partly, but far from entirely, illusory in this sense. For example, the rise in total GNP in current dollars from the year 1950 to the year 1951 was

The GNP Concept. The Gross National Product or Expenditure is a statistical estimate of the market value of the total output of goods and services currently produced in the national economy, before deduction for depreciation and other allowances for consumption of durable capital goods.

The main streams of the Gross National Product are the purchase of goods and services by consumers and by government (including federal, state, and local), gross private domestic investment (including new construction, investment in producers' durable equipment, inventory changes) and net foreign investment.

All dollar figures for GNP or its parts used in this article, unless otherwise specified, are the official estimates of the U. S. Department of Commerce, National Income Division. Interpretations, as well as percentage computations, are our own.

about 16 percent; after allowance is made for price rises in the interval, the gain in GNP (in "constant dollars") is about 8 percent.[1] Furthermore, during each quarter since June 1950, it appears that GNP has increased even after allowances for price changes, although such gains would not be as large as those shown on the chart.

Six important components of GNP are shown in the first chart on page 4. Altogether they account for a large part of GNP, and a consideration of their magnitudes may help provide a framework for assaying day-to-day problems as the nation moves forward toward the "plateau of rearmament." The perspective which they yield may also be useful in taking the dimensions of the problems which will be faced when (or if) the rearmament program is eventually unwound, — at least in part.

The remaining three components designated as "All Other" are shown in detail on the smaller chart in the lower right corner of the same page.

Government Purchases The heavily shaded area at the base of the first chart indicates in billions of dollars, the portion of GNP represented by *federal government purchases of goods and services,* — mainly but not altogether for defense. Its rise since Korea is obvious. It is equally clear, however, that the federal government's share even after the rise has not been as large as certain other components of GNP. (More details on proportionate parts are discussed at a later point.)

Private Investment The item marked "Producer Durables," located on the chart just above the area for government purchases, refers to private investment in *producers' durable equipment,* e.g., machinery and plant equipment of all kinds. This share, although it has not risen as spectacularly as government expenditures, has been important in the period since Korea; its connection both with the defense effort and with the brisk pace of economic activity in recent times is a matter of common knowledge. "Producer Durables" together with "Construction," standing for private investment in *new construction,* constitute the bulk of the broad segment of GNP classified by the Department of Commerce as Gross Private Domestic Investment. (Inventory changes, shown nearer the top of the chart, are also part of gross private domestic investment.)

Personal Consumption The next layer, reading upward on the chart, is "Consumer Durables," or more exactly, *personal consumption expenditures for durable goods,* e.g., autos, appliances, furniture, etc. As a part of GNP, this sector appears in the chart to be somewhat steadier than might have been expected in view of the well-known fluctuations in production and sales of such goods during the postwar period. (The scale of the chart is small relative to the billions of dollars involved.) The two "post-Korean" scare buying episodes, however, are reflected in the chart by waves cresting at the third quarter of 1950 and the first quarter of 1951.

The sector entitled "Consumer Nondurables" is, as usual, by far the largest single major component of GNP. This refers to *personal consumption expenditures for nondurable goods,* including such vital consumer items as food and clothing. It is obvious from the chart that consumer expenditures for nondurables has tended to rise somewhat in dollar volume, but since Korea has declined as a proportion of GNP.

Inventory Change The dotted area above or below the upper boundary of the consumer nondurable segment represents *changes in business inventories.* During 1946 and 1948 it was an appreciable "plus" amount to take account of net additions to inventories of all kinds. During the minor recession of 1949, inventory reductions were a significant "minus" element in the GNP total. After Korea, inventory building was resumed on a large scale, due partly to fears of impending shortages, and became a large "plus" item by the second quarter of 1951. Subsequently, inventory building diminished, finally reaching a point during the first two quarters of this year where inventories show little over-all change.

Other Parts of GNP The parts of GNP designated as "All Other" now require explanation. Included are personal consumption expenditures for *services,* purchases of goods and services by *state and local governments,* and *net foreign investment.* Neither consumer services nor state-local government purchases have shown any sharp increase in the "post-Korean" period, although the dollar volumes tend to rise persistently from 1946 to the present.

Net foreign investment, which broadly includes the excess of exports over imports (other than those exports financed by grants or gifts) together with related items, represented an addition to total GNP during several of the earlier postwar years, and also, to a less extent, during recent quarters. During 1950 and early 1951, however, the foreign account was a "minus" item in GNP reflecting in part a sharp increase in imports of raw materials.

---

(1) Based on Department of Commerce estimates of GNP in "constant dollars."

The relationships discussed in this article are all in current, rather than constant, dollar terms, for the reasons that: (a) constant dollar estimates are not available regularly on a quarterly basis (b) relationships between parts of GNP, as for example when expressed as percentages of the total, tend to hold broadly true whether or not attempt is made to remove the effects of price change all along the line.

Shares of the Total

The foregoing resume of trends in total GNP and its major parts, as illustrated by the first two charts, is intended to show the main movements in national production before and after Korea, in a general context which exhibits the relative size of the various parts.

Within wide limits the relation of the parts to each other is constant. For example, consumer expenditures for nondurable goods by their very nature (a vast aggregate of many relatively small, but recurring, purchases on behalf of 157 million people) involve a considerably larger dollar total than investment in new construction, even in times when the latter is on the rise.

A closer view of recent changes in the composition of GNP requires a device such as that shown by the chart at the left side of page 5. Each of certain selected parts of GNP is expressed as a percentage of total GNP, and such percentages or "shares" are charted over the time periods under discussion, in such a way that the tendencies of change in the various shares may be compared.

Enlarging or Steady Shares

Reading downward on the "share" chart, and paying special attention to the positions at the right of the red lines (post-Korean period) it is clear at a glance that federal government purchases of goods and services make up the *only* major component which has risen since Korea as a percentage of total GNP. Investment in producers' durable equipment has kept pace in general with the rise of total GNP, as indicated by the relative steadiness of the line which represents its share. The share of total GNP represented by investment in new private construction, on the other hand, fell off somewhat in 1951, and then rebounded during the first two quarters of this year.

Diminishing Shares

On the consumption side, as represented by the three segments at the bottom half of the chart, the central tendency has been a decline of the respective components when measured as percentages of total GNP. In the case of personal consumption expenditures for durable goods, the post-Korean period opens with expenditures on such goods (autos, appliances, furniture, etc.,) at an alltime peak not only in dollars, but also as a proportion of GNP. This was the result of the scare buying immediately following the Korean outbreak. (It is interesting to note that concurrently, government expenditures as a percentage of GNP were at a temporary trough, prior to their renewed climb. See top section of chart.) The reaction to the scare buying of consumer durables, coupled with competing demands on materials entailed by the rearmament effort, resulted in a marked drop in consumer durables as a share of GNP during late 1950 and parts of 1951. During the past four quarters, however, this segment of GNP has tended to hold its own with the total.

In the case of the share of GNP represented by personal consumption expenditures for nondurable goods, the tendency to decline has been rather persistent during the period since 1947. (This is the other side of the coin from the emphasis on investment, durable goods, and defense that has characterized the postwar period in general.) Thus, from a high in the third quarter in 1947 when consumer nondurables represented 41.4 percent of GNP, this important component dropped to a low during the second quarter of 1951, when it was 33.8 percent of GNP. During the most recent four quarters, the ratio has recovered slightly, and has been running somewhat above 34 percent.

Personal consumption expenditures for services as a proportion of GNP, depicted in the final strip of the "share" chart, reached its highest point of the postwar period in 1949, when the dollar volume of expenditures for such services was sustained at the same time that the most volatile components of GNP were declining. Since Korea, the ratio declined for a time, but during the past year or more it has leveled off at a position about the same as in 1947 and 1948.(2)

The small chart in the lower right corner of page 5 summarizes the changes in the various components of GNP expressed as percentage shares of the total. For each share, the average for the peacetime years of 1935-39 is portrayed as a benchmark for comparison with averages for the pre-Korean and post-Korean phases of the postwar period.

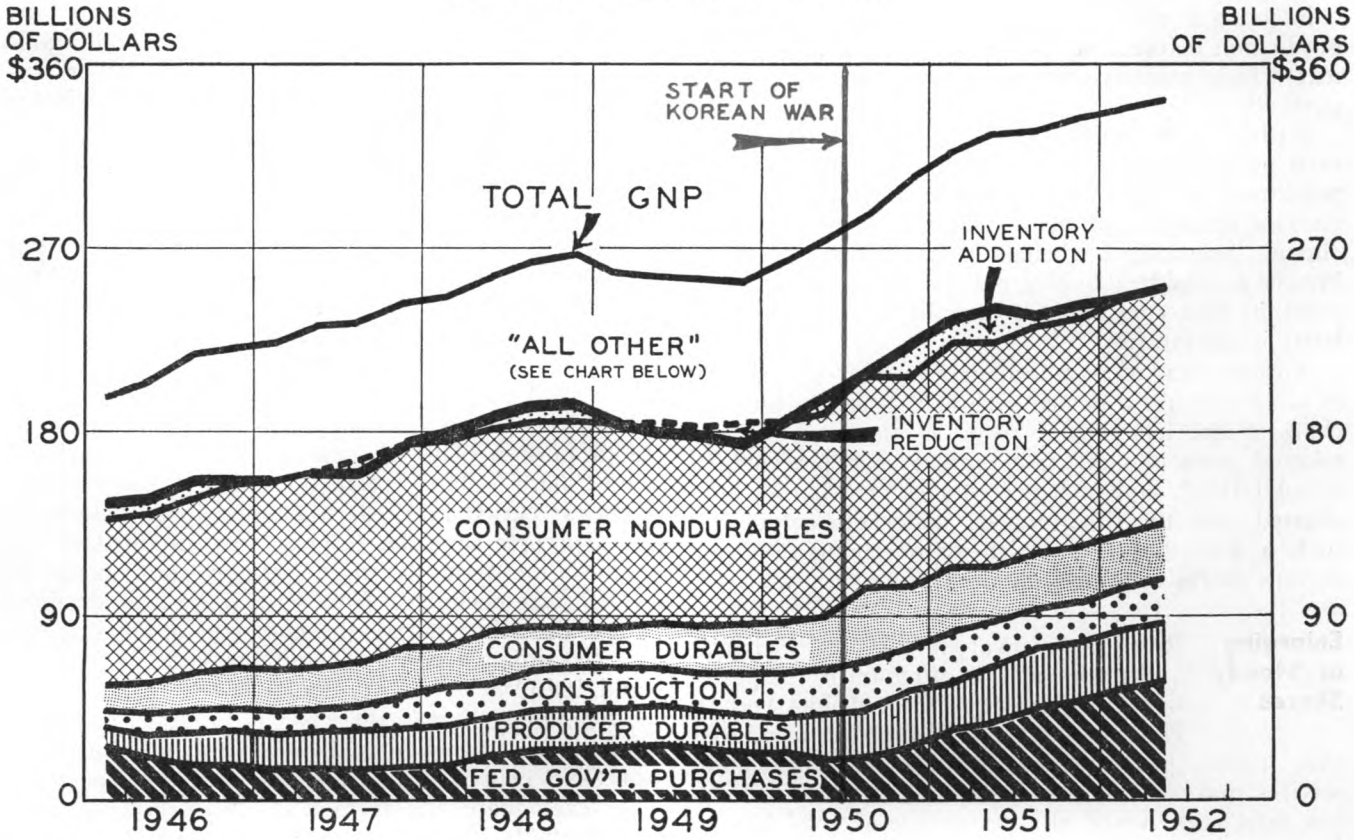
Viewed against the background of the late 1930s, it is clear that federal government purchases, producer durables and new construction show a broadly comparable pattern. In all three cases, the postwar shares of total GNP are substantially larger than the 1935-39 percentages, and in all three cases the post-Korean share is larger than the pre-Korean share. In the case of federal government purchases, the post-Korean share is more than twice the 1935-39 share, expressed as a percentage of total GNP.

The role of consumer durables is somewhat different. Here the post-Korean share of total GNP is smaller than the pre-Korean share, although larger than the 1935-39 share.

Consumption expenditures for nondurable goods and for services, both of which are large components of GNP, have behaved at the opposite extreme of federal government purchases as a share of GNP. (Contrast extreme right of the bar chart with the extreme left.) In the case of these consumption items, the pre-Korean phase of the postwar period

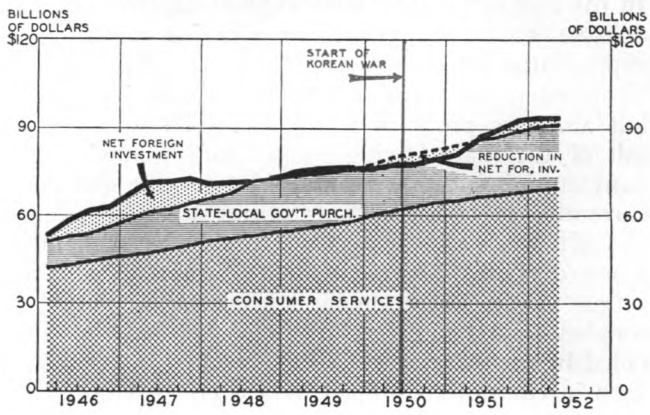
(2) The elements of GNP which are not shown in the "share" chart are state-local government expenditures, inventory change and net foreign investment.

COMPOSITION OF GROSS NATIONAL PRODUCT
Quarterly 1946-1952
(Seasonally Adjusted, Annual Rates)



. . . the gross national product has risen in each quarter of the entire postwar span, except during 1949; purchases of goods and services by the federal government have been an important element in the rise since the outbreak of the Korean War; inventory building was significant in late '50 and the first half of '51; personal consumption expenditures for nondurable goods (the largest single component of GNP) has tended to rise in dollar volume but to decline somewhat as a proportionate part of GNP.

COMPOSITION OF "ALL OTHER"
Components of GNP Not Shown in Detail in Previous Chart
(Seasonally Adjusted, Annual Rates)

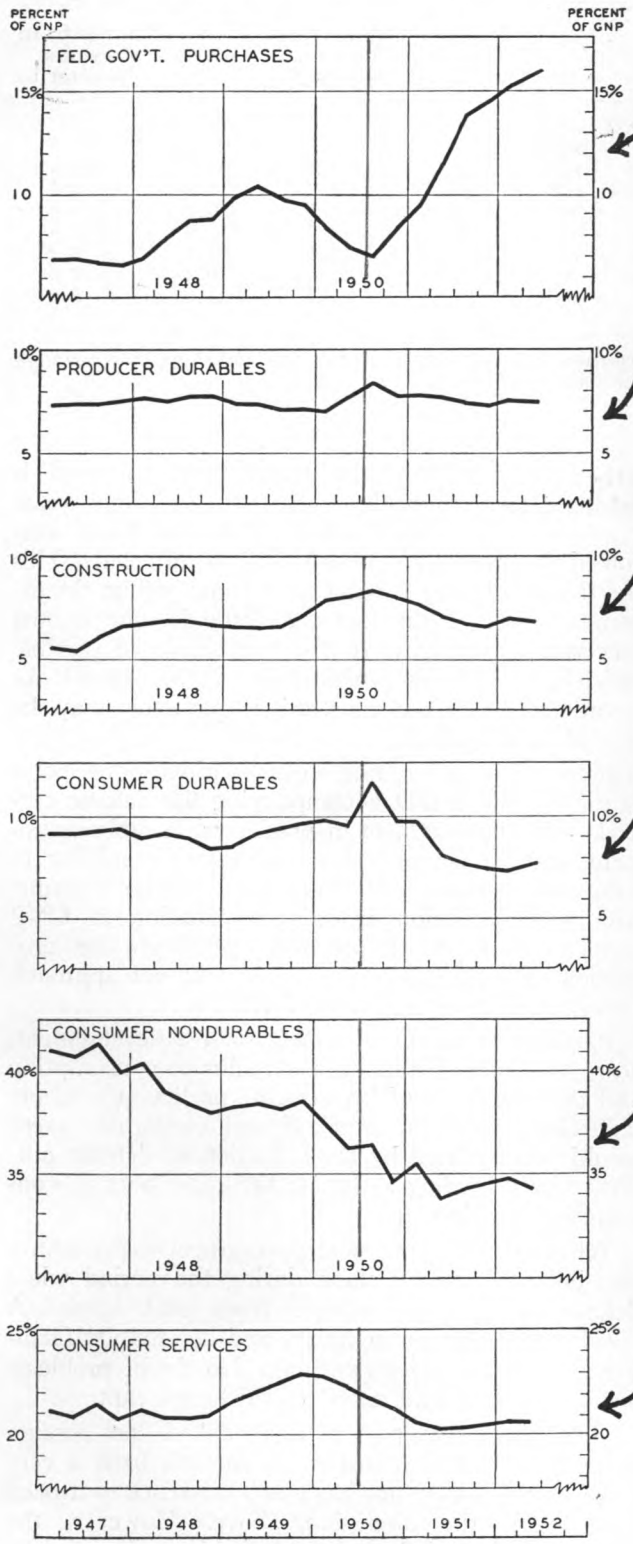


. . . largest of the remaining parts of the gross national product (not itemized on the previous chart) are personal consumption expenditures for services, and the total of state-and-local governments' expenditures for goods and services; these have shown no acceleration since Korea.

SELECTED COMPONENTS OF GROSS NATIONAL PRODUCT

Expressed as Percentage of Total

(Quarterly 1947-1952; red marks date of Korean outbreak)



. . . purchases of goods and services by the federal government have accounted for an increasing share of the total GNP since Korea, but the rate of rise has been slowing in recent quarters.

. . . private investment in producers' durable equipment, expressed as a share of GNP, has been maintained fairly steadily since Korea at a rate slightly higher than during 1947 to mid-'50.

. . . the share of GNP represented by private investment in new construction showed some falling tendency during 1951, but rebounded in early 1952.

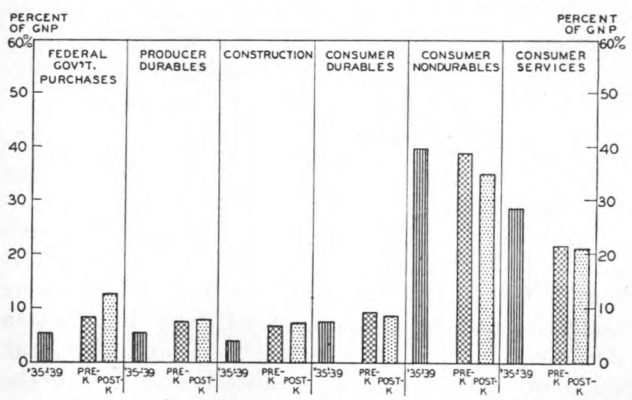
. . . personal consumption expenditures for durable goods has accounted for a decreasing percentage of GNP since the scare-buying peak of the 3rd quarter of '50, but the ratio has tended to level off during recent quarters.

. . . from early 1947 through mid-'51, personal consumption expenditures for nondurable goods tended to decline as a proportionate part of GNP; the last four quarters have seen a slight recovery in this ratio.

. . . personal consumption expenditures for services, expressed *as a share of GNP,* have returned about to the 1947-48 position, after a rise to a peak in late 1949.

AVERAGES FOR POST-KOREAN PERIOD, COMPARED WITH IMMEDIATE PRE-KOREAN PERIOD, AND WITH 1935-39

(For Selected Components of GNP, Expressed as % of Total)



. . . purchases of goods and services by the federal government since Korea have accounted for a larger share of total GNP than during 1947 to mid-'50, and for about twice as large a share as the average for the prewar years of 1935-39; at the opposite extreme, consumer expenditures for services have recently represented a smaller share of GNP than in prewar times, and a smaller share after Korea than just before Korea.

witnessed a decline of the percentage shares from the 1935-39 average, and the decline was continued further in the post-Korean phase.

Interrelations of the Parts

When one or more components of GNP rise as a percentage of the total, it is arithmetically inevitable that one or more of the other components will fall as a proportion of the total. Does it follow from this that the marked rise in federal government expenditures during the post-Korean rearmament has been *at the expense* of the other shares in the final reckoning? Arithmetic does not answer this question. It could be so, to the extent that demands are pressing on scarce materials and manpower, and actual "physical diversion" takes place. The other possibility is that the stimulating effects of government expenditures (and the associated rise in private investment in equipment, etc.) make for a larger total of real GNP than otherwise would be the case, assuming the existence of the necessary industrial capacity. Which way the balance falls in the period under review is a very important question, but it will not be tackled here; at best, the question is "iffy."

Two additional facts, related to the showing made by the charts, may serve to amplify the relation of government expenditures to other parts of GNP.

(1) Although, as already noted, "federal government expenditures" as a *percentage share* of GNP is the only major component to have risen since Korea, it is *not* the only component to register significant increases in dollar volume during the post-Korean period. Of the eight calendar quarters of this period, five show rises in government purchases which were substantially less than total gains in GNP. (See Table 1, especially third and fifth columns.) So far this year, however, gains in government purchases have been about equal to the gains in total GNP, which means stability in the dollar totals of all other components together.

(2) The "share" chart reveals that major shifts in the percentage makeup of GNP after Korea have so far been confined to the first year, i.e., from mid-'50 to mid-'51. By contrast, the four quarters from mid-'51 to mid-'52 show a greater stability of relations. (Concurrently, inflationary tensions were easing.) This suggests the possibility, but not a guarantee, of a smooth passage through the peak period of rearmament lying ahead, and up to the period of slackening of defense expenditures.[3]

(3) A steadiness of relations among the parts of GNP is by definition an avoidance of certain types of strains and distortions. In itself, however, it is no guarantee against inflation. It is possible to have a sharply inflationary situation when all major parts of GNP are moving upward (in dollar terms) in an approximate unison.

Table 1

DOLLAR RISES IN FEDERAL GOV'T PURCHASES COMPARED WITH DOLLAR RISES IN GNP

(Seasonally Adjusted Annual Rates)

	Federal Government Purchases	Change from Previous Quarter	GNP	Change from Previous Quarter
1950—2Q	20.8		277.8	
—3Q*	20.5	— .3	291.3	+13.5
—4Q*	25.5	+5.0	304.2	+12.9
1951—1Q*	30.8	+5.3	319.6	+15.4
—2Q*	38.3	+7.5	329.3	+ 9.7
—3Q	45.5	+7.2	330.9	+ 1.6
—4Q*	48.9	+3.4	337.1	+ 6.2
1952—1Q	51.2	+2.3	339.4	+ 2.3
—2Q	54.9	+3.7	343.0	+ 3.6

* Quarters in which rises in federal government purchases were less than total gain in GNP.

Post-Mobilization When the rearmament program is over the crest two or three years hence (according to the latest version of the outlook) how will GNP be affected? This question is already a subject of some public discussion, in spite of the fact that little is now known concerning the timing or the magnitude of possible cutbacks in defense expenditures. A few broad observations and some illustrative questions may be offered at this point.

In the first place numerous considerations point to the likelihood that accompanying the defense cutback, private investment in producers' durable equipment and in new construction may be subject to influences making for reductions in dollar volume. Any such reduction in this combination of GNP segments could be appreciable, although the proportion of total GNP involved should not approach the dimensions of the 1945-46 shift.

Partially or totally offsetting such a development, however, there should be a stimulus to consumption and to some types of investment, particularly as tax reductions (both in personal and corporate taxes) would be permitted by the reduction of defense outlays, thus providing a climate favorable both to consumption and investment.

Will a rise in state-local government expenditures also help to take up slack during the period when defense outlays are reduced from peak levels? A backlog of needs for highways and community facilities is certainly suggestive here. No doubt problems of local finances and taxation will be relevant.

How about that part of GNP called "net foreign investment"? This item has not recently been a very large part of GNP, nor has much reference to it been included in the discussion above. However, the whole question of the relation of this country to the

(CONTINUED ON PAGE 10)

Farm Short-Term Debt—Top-Heavy?

IN absolute dollar volume, the short-term debt of American farmers today is the largest on record. For each $1000 owed in 1939, farmers are now obligated to the amount of $3100, in the form of short-term debt.

On the other hand, in *relation* to the value and volume of the instruments of production currently in use in American agriculture, and the dollar value of farm output, the present short-term debt of farmers seems to be unusually small.

Between these two extremes there is another valid comparison, namely, the ratio of short-term debt to *net income*. By this third yardstick, short-term debt is neither light nor heavy — at prevailing prices.

The real status and possible significance of the "record" short-term debt of farmers can be appraised only by surveying the situation from several different angles, not one of which will provide a conclusive answer by and of itself.

In Relation to "Working Assets"

Credit is an almost universal prerequisite of rapid growth in business. Any growing industry requires a steady increase of investment not only in plant but in the production implements therein. To the farmer growth has meant more tractors, machinery, and livestock. These "tools" for production have boosted farm output at unprecedented rates. Yet the amount of short-term debt currently outstanding is near the lowest in history in relation to the investment in these "working assets."

Farm short-term debt dropped to less than twelve percent of the value of equipment and livestock within a year after our entry into World War II. It has remained at this low level throughout the seven postwar years.

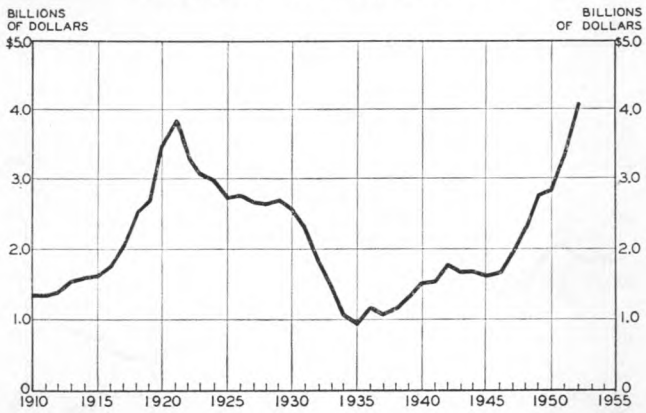
This contrasts sharply with the period following World War I. By 1921, short-term debt had also risen to a record dollar high which stood until this year, but this debt was then equal to 40 percent of the value of these non-real-estate assets. This unfavorable relationship was followed by many years of painful readjustment. The ratio was reduced to 25 percent by the early 1930's, but was still in excess of 18 percent as recently as 1940 and 1941.

The current more favorable relationship between debt and assets implies a greater security both for lenders and for farm operators. A period of declining farm prices could reduce the valuation placed upon these assets. The rate of loss, however, would now have to be unprecedented in magnitude to precipitate a relationship as unfavorable as that which existed during the most unfavorable periods of the past four decades.

From 1930 to 1932 the value of farmers' investment in equipment and livestock was reduced by 35

Note: Short-term farm debt as used herein is to institutional lenders only. These include all banks and federally sponsored agencies and account currently for over one-half of the total short-term debt. Dealers, merchants, individuals, etc., are excluded. The discussion is confined to outstandings on January 1 and does not attempt to appraise turnover within the year. Comparisons represent national averages and thus do not necessarily apply to all specific localities; however, conditions within the Fourth District probably average at least as good as the national average. Some debts secured by farm mortgages are used to provide operating capital to purchase equipment and livestock. Such debts are not considered in this discussion.

SHORT-TERM FARM DEBT*

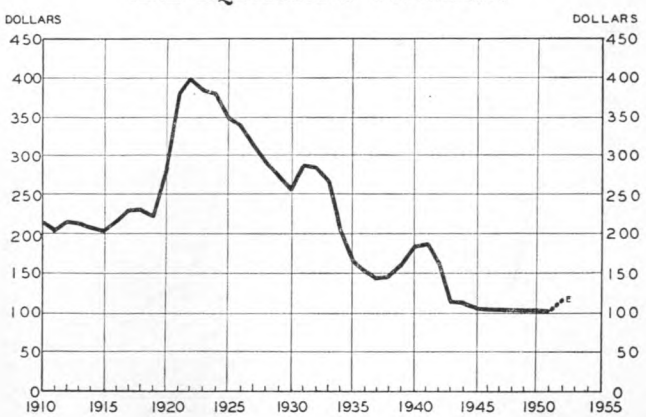


. . . the short-term debt of farmers now exceeds $4 billion, having recently broken through the former peak reached 21 years ago.

* As stated in the text, the data for this and all ensuing charts refer to institutional debt only.

Source: Bureau of Agricultural Economics.

SHORT-TERM DEBT PER $1,000 OF LIVESTOCK AND EQUIPMENT ON FARMS



. . . for every $1,000 of livestock and equipment on the farm the average farmer owes less than $120 in short-term debt, as against $400 in 1922.

E Estimated.

Source: Derived from Bureau of Agricultural Economics data.

percent. It would now take a drop in excess of 50 percent to create a similar debt-asset ratio in spite of the current record-high dollar debt. Similarly, from 1920 to 1922 these assets were reduced in value by 31 percent but the present value would have to be cut by over two-thirds to create a ratio of comparable unfavorableness. Actually the rate of shrinkage would likely have to be even greater because at the same time the debt itself would tend to decline, thus prolonging the period within which the relationship would reach historical lows.

In Relation to Cash Income Never before have farmers been able to repay a given quantity of debt with so small a physical volume of farm output. Except for the brief interruption just prior to the Korean War, rising prices for farm produce have reduced the amount of output required to pay each $1000 of debt during every year since 1939. The current favorable relationship surpasses even that of the booming years of World War I and ranges from one-half to less than one-fourth that of all other years prior to 1940.

This relationship has been improved even more by the fact that the physical volume of farm output available for paying each unit of debt has also risen to record heights. The greater output at rising prices has boosted cash farm income at a rate and to a level without parallel in the history of American agriculture.

On the other hand, as has already been pointed out, the short-term debt of farmers has by no means remained fixed or constant during this period of rising income. Debt more than tripled during the past thirteen years. The consequent ratio between actual debt and actual cash farm income shows a somewhat different situation than the comparison of a fixed debt with prices alone.

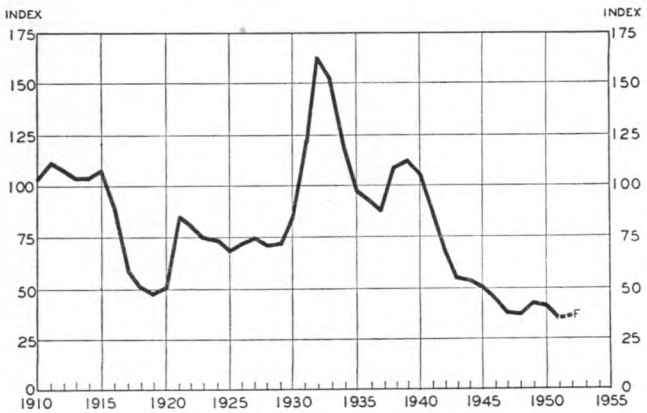
Cash farm income is expected to set another record in 1952, the ninth in eleven years. The proportion of this income, however, that will be needed to pay the January 1 debt may be the largest since 1941 and about equal to the 1935-37 average. An estimated 13 percent of the 1952 receipts will be required if the carry-over of debt from last year is paid in full. This would represent the fifth consecutive year of increase from the all-time low of six percent. It is still better, however, than in most years previous to the last decade, particularly in comparison with the 48 percent and 38 percent reached in the extremely unfavorable years of 1921 and 1932.

Net Income Ratio If any warning sign is evident concerning the general short-term debt position of agriculture it would perhaps be in the relationship it bears to net income.

Gross earnings have shown a marked change of distribution in recent years with a much larger share going to cover production costs. Net cash income now amounts to roughly 45 percent of gross cash income, whereas it was in excess of 57 percent for many years prior to 1948. This change is significant in that it is largely the remaining net income which must be drawn upon to pay outstanding debt unless assets are liquidated or the debt is refinanced with a long-term real estate mortgage.

At the prevailing ratio of net to gross cash income, the current short-term debt could become distinctly and widely burdensome if the gross were reduced

PHYSICAL VOLUME OF FARM OUTPUT NEEDED TO PAY A $1,000 DEBT

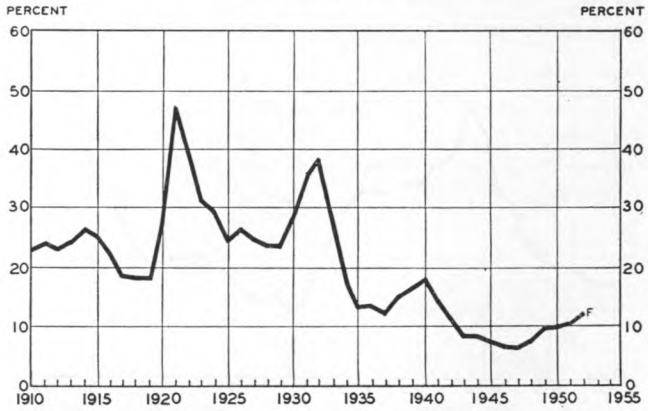


. . . in paying off a given short-term debt today, a farmer needs only 36 bushels, pounds, or bales, as against over 160 in the extremely adverse year of 1932.

F Forecast.

Source: Derived from Bureau of Agricultural Economics data.

PORTION OF GROSS CASH INCOME EQUIVALENT TO SHORT-TERM DEBT

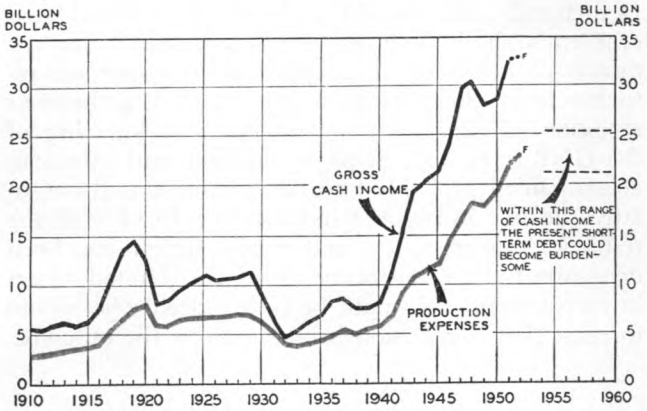


. . . to pay off existing short-term debt would require only about 12 percent of gross income, as against nearly 50 percent in 1921. The percentage has been rising, however, since 1947.

F Forecast.

Source: Derived from Bureau of Agricultural Economics data.

CASH FARM INCOME AND PRODUCTION EXPENSES

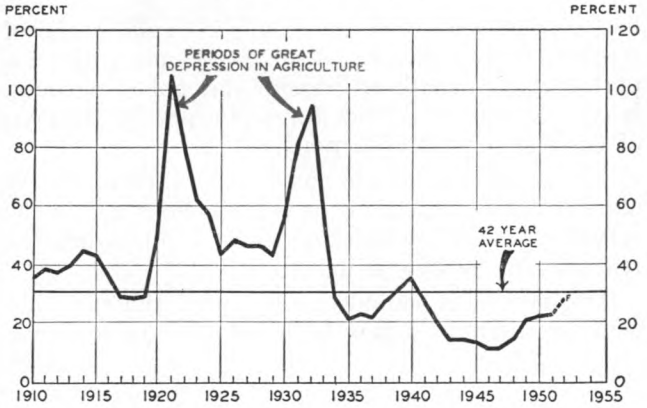


. . . a relatively small reduction in gross cash income to early postwar levels could greatly handicap farmers' debt repaying ability, because production costs have also increased sharply.

F Forecast.

Source: Derived from Bureau of Agricultural Economics data.

SHORT-TERM DEBT AS A PERCENT OF NET FARM INCOME



. . . the record short-term debt is not far from 30 percent of *net* income (long time average)—the residual out of which debts are paid.

F Forecast.

Source: Derived from Bureau of Agricultural Economics data.

merely to levels which prevailed during the early postwar years. This assumes that prices paid by farmers for production goods will largely maintain their "sticky" tradition.

Both net income and short-term debt have fluctuated widely over the past 42 years. An average of all these years will show that about one-third of the net income would be required if the debt carried over from the previous year were to be paid in full. This has ranged from a low of 11 percent in 1947 to a high point back in 1921 when the entire annual net income would not have retired the debt.

The record dollar debt outstanding on last January 1 was not far from that average in relation to prospective net income for the year of 1952. The relationship was about as favorable during World War I, and was more favorable in all but a few years since the early 1930's.

Net dollars remaining after subtraction of outstanding debt may be greater in actual numbers now than in other favorable periods previous to 1946. Their buying power, however, has been greatly reduced and any substantial loss of them would cut farm living standards and hinder agriculture's ability to mechanize and apply other improved practices for high efficient production. Even the liquidation of some existing production facilities would seem probable should they fail to yield a satisfactory return.

In the final analysis it appears that agriculture in general is not in an immediate precarious position even though dollar debt is the largest on record. In some respects most farmers are in excellent condition. It must be conceded, however, that their ability to repay the growing short-term debt out of current income has become slowly but progressively less favorable through most of the postwar years. With the present debt load, a distinct and widespread problem could emerge if gross cash receipts were reduced even to World War II levels. This would result in a considerable amount of asset liquidation and refinancing of short-term loans. A temporary weakening in domestic and foreign farm produce demand of a smaller degree than has occurred in many past periods could bring about such a situation.

The financial condition of many farmers would undoubtedly carry them through a rather short-run period of stress, but those who are heavily indebted would be severely affected by a relatively small decline in income.

NATIONAL PRODUCT

(CONTINUED FROM PAGE 6)

less developed parts of the world is bound to be of continuing importance. A relatively substantial export of capital, both on private and public account, is one of the possibilities for replacing the fractions of GNP slated for reduction.

The above notions are merely indicative of dozens of different permutations or combinations within the structure of GNP which may occur if and when the rearmament burden is lightened.

The possibility cannot be excluded that two less enticing alternatives may be faced: (a) an economic rescue mission, or pump-priming series of operations, by the federal government in order to "fill the gap" (structurally, this would maintain the federal government's share of GNP at a high level, but by means of activities quite different in important respects from the present ones) or, (b) a business recession. (The latter would imply a lowering of the GNP total both in physical terms and in prices, accompanied probably by unemployment and cumulative decline in business indicators.) In view of the resiliency under shock and strain which has been demonstrated by the economy of the United States in recent years, he would be rash indeed who would forecast that a recession is bound to be the outcome.

Announcement

The Farmers and Merchants Bank, Fairborn, Ohio, became a member of the Federal Reserve System on August 7, 1952.

The new member bank is located in a town with a population of about 10,000, a few miles northeast of Dayton, Ohio.

Incorporation of the bank took place October 31, 1951. At the present time, combined capital and surplus total $200,000. Officers of the new member bank are:

A. E. Chenoweth ..... President

D. W. Hoak ..... Vice President

Arthur J. Gneuhs ..... Cashier

Miss Marjorie Wones ..... Assistant Cashier

The Rare Earths and Their Future

by CLYDE WILLIAMS, Director, Battelle Memorial Institute

A relatively unused group of metals, only partially explored by the scientist and seldom heard of by most people, is today assuming greater importance to industry.

Commonly known as the "rare earths," the fourteen metals in the group have been classified in the Periodic Table by the following tongue-twisting names: cerium, promethium, praesodymium, neodymium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, and lutecium. Four others, lanthanum, yttrium, scandium, and thorium, are frequently attached to the rare-earth group because of their close relationship in the Periodic Table, in some minerals, and in some production properties.

The rising importance of the rare-earth metals stems from several developments. First, recent discoveries of large domestic resources of these raw materials will support a great expansion in their use for years to come. They will not be produced in tonnage quantities comparable to such common metals as steel, copper, and aluminum. They will, however, be used more to do a job better than some other material is now doing, or to do a job that some other material is unable to do. Second, improved technological practice will provide scientists with greater quantities of the individual rare earths and enable them to study industrial applications more completely. Third, sizeable new markets for use of the rare earths may develop in steelmaking, as well as in the aviation, electronics, and atomic energy industries.

Metallurgists have found that small amounts of the rare earths can improve the quality of end products made from such metals as steel, aluminum, and magnesium. The rare earths, added to some primary metals, can improve resistance to oxidation and corrosion at high temperatures, impart strength, cut down impurities, and make them easier to work into desired shapes.

Heretofore, it has been extremely difficult to isolate the individual rare earths because they occur together and are very much alike chemically. As many as 40,000 operations have been required to get some of the rarer rare earths really pure. Present commercial usage, consequently, has been largely confined to "misch metal," a mixed form of the rare-earth metals usually consisting of 50 per cent cerium, 30 per cent lanthanum, and a 20 per cent combination of the other rare-earth metals with a trace of iron.

The principal uses for the rare earths are as misch metal, to make "sparking" flints for cigarette lighters, and as oxide and fluoride compounds in the cores of arcing carbons for moving-picture projectors and searchlights, where they produce light of sun-like brilliance. Other uses are as oxide or carbonate compounds in the glass industry for coloring, polishing, and special optical effects, and in the electronics industry for making capacitors. For these and other highly specialized uses, the total consumption of monazite sand, from which misch metal and the rare-earth compounds have been derived in the past, amounted to about 3,000 to 4,000 tons in the United States in 1951.

Monazite sand has customarily been imported from India and Brazil. India, in 1949, and Brazil, in 1951, imposed embargoes on the exports of the mineral. This was done apparently to set up rare-earth processing operations for sale of more profitable finished products, and to curtail recovery of thorium for atomic energy uses by other countries. The price of monazite soared from $60 to $300 per ton in the United States. Old domestic sources that previously had been unprofitable to work were then reopened. An intensive search for rare-earth deposits also followed in an attempt to make our country independent in supply of the metals.

The recent search has brought forth startling discoveries of large deposits of rare earths in several western states, including California, New Mexico, and Idaho. The most promising discovery is contained in a huge "barite-carbonate rock" deposit, rich in bastnasite, found in southern California. The mineral bastnasite is a compound of cerium, lanthanum, and other rare-earth metals. Reports have been made recently, based on drillings to 50 feet, showing that this deposit may contain a very high potential of tonnage of the rare-earth metals.

Wider industrial usage of the rare earths has been brought closer also by the work of the Atomic Energy Commission in developing a more rapid, efficient method of separating the individual metals. The AEC has a stake in the rare earths because they occur as by-products of the atomic energy pile. Furthermore, the mineral thorium, usually found associated with the rare earths, is under study as a possible raw material for atomic energy generators.

The AEC's improved method for separating the individual rare-earth metals is based on "ion exchange." It is expected that the ion-exchange method will be used most extensively to isolate the more closely bound rare earths, such as neodymium and praesodymium. The more common rare earths, cerium and lanthanum, will probably still be separated by the conventional method known as fractional crystallization. A number of commercial firms are reported to be producing the rare earths by both methods.

There has not been much demand for the individual rare earths because so little is known about their individual properties, and such small quantities of isolated metals have been available at reasonably low cost. The tendency in the future, however, will be to separate the individual metals into pure form. A frequent result of purification is to give an entirely new field of usefulness not realized from the impure metal of the past. Speedier progress towards new uses is now possible, thanks to more efficient methods for recovering the pure rare earths and to a great improvement in the domestic supply of the raw materials.

Editor's Note — While the views expressed on this page are not necessarily those of this bank, the *Monthly Business Review* is pleased to make this space available for the discussion of significant developments in industrial research.