A review by the **Federal Reserve Bank of Chicago**

Business Conditions

1956 December

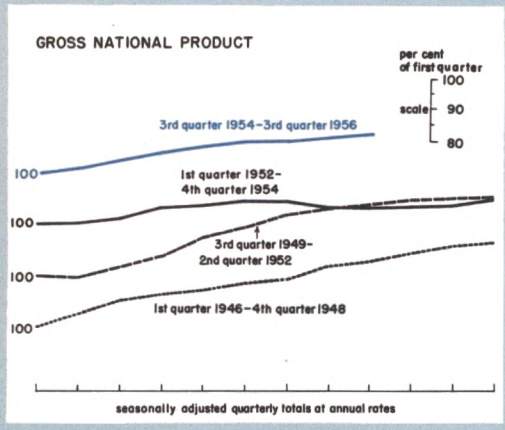
Contents

THE Trend OF BUSINESS

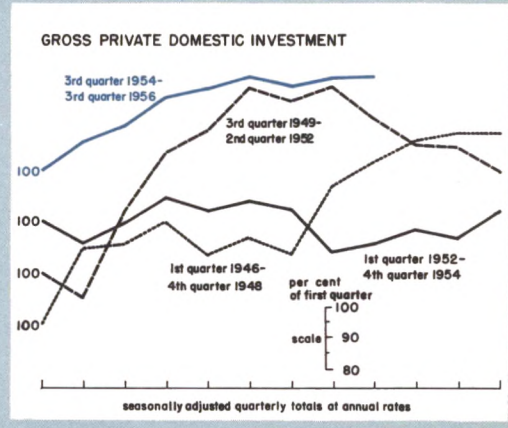
The turn of the year is the time-honored occasion for pronouncements as to what lies ahead for business. Behind each such "looking forward confidently" or "viewing with alarm" lies a pointed and sometimes surprisingly complicated consideration of the factors that affect the course of business. For some forecasters, weighing these considerations is an intensely personal task, drawing upon individual experience, perception and instinct. Others may rely heavily upon published statistics and the trends they seem to be pointing for the future. However his final conclusion is reached, it is characteristic of the business analyst to want to compare the hopes and fears attending his appraisal with others of his breed. As a consequence, the late autumn scene is dotted with huddles of forecasters comparing preforecast notes.

What goes on in such circumstances can be illustrated by the happenings last month on the campus of the University of Michigan, where the school's Department of Economics sponsored its Fourth Annual Conference on the Economic Outlook. Here some 115 economists, mostly from leading business and financial concerns across the country, gathered to weigh the future. The program was one of formal speeches followed by discussion—often lengthy and vigorous when a controversial issue was touched. The speeches were designed to present a variety of methods of economic forecasting, focused upon areas of strategic significance to business. Doing the talking were

Latest rise in output more sustained than two prior upturns . . .



a major cause has been persistent climb of investment outlays . . .



some of the nation's leading business and academic economists.

Growth potential

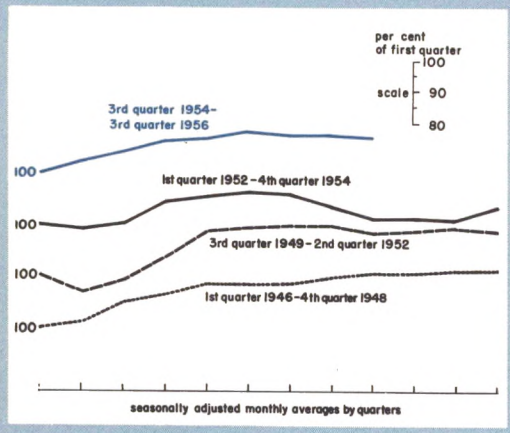
The lead-off speaker outlined the probable capabilities of the economy in 1957, based upon studies by the staff of the Joint Congressional Committee which receives and analyzes each year the Economic Report submitted by the President. The key factors in this projection were the long-run historical relationships within the economy in the past years of high employment. Within this sort of framework, a rise in every major segment of domestic demand was projected for 1957. Total consumption outlays were expected to increase 14 to 18 billion dollars. Governmental outlays were ticketed for a 4-6 billion increase, of which scheduled Federal defense expenditures might account for at least 2 billion. Even expenditures on housing seemed likely to rise; a projected further slip to the 1 million annual rate in new housing starts would be more than offset by the effects of increased prices, larger homes and stepped-up repair and modernization spending. All told, such demands were expected to push up the nation's total output of goods and services next year to the 430-440 billion range (1956 estimate: 412 billion); the gain would come partly in physical output and partly via a continued moderate price advance.

Consumer attitudes

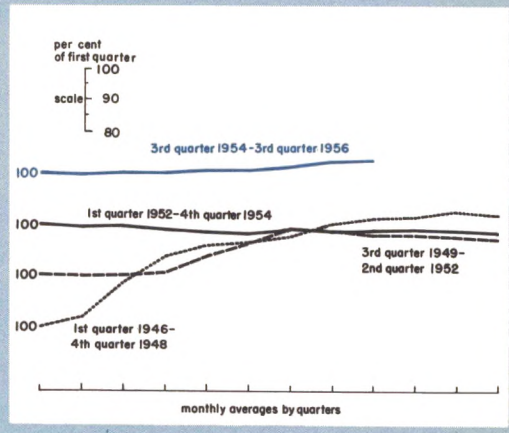
For a more intensive look at the nation's biggest spender — the consumer — the analysts heard a report of studies undertaken by Michigan's pioneering Survey Research Center. The Center carries on a formal program of interviews to plumb individuals' attitudes and intentions. The latest rounds of interviewing suggested a continuation of underlying optimism, but of the sort that would accompany a high-level stability in buying rather than a substantial further increase in consumer spending.

In probing for weaknesses in the consumer sector, the Survey Research Center had tried to throw some light on four "bogey-man" questions about the American consumer: Are his desires for durable goods becoming saturated? Is his interest in new housing on the wane? Is instalment debt currently a burden on borrowing families? Has the trend to "buying on time,"

general movement of **industrial production** has been more gradual . . .



and average **wholesale prices** have rivaled 1952-54 period in stability



along with other influences, weakened the will to save? Interviews revealed a set of consumer attitudes, compounded of past experience and innate desires, which suggested a negative answer on the part of the consumer to each of these questions so long as changes in his income flow or the general business picture did not upset his expectations.

On the other hand, the impetus for any major lift to the economy through a new upsurge in consumer spending was difficult to find. Likeliest candidate was judged to be the improvement in consumer asset-to-debt ratios as 1956 progressed, but this is the gradual sort of influence that seldom can trigger a sudden general reaction.

Business surveys — capital spending

The gist of surveys of businessmen as well as consumers was also reported to the Conference. The McGraw-Hill Publishing Company, still in the midst of its annual study of business intentions regarding plant and equipment spending, was not in a position to present results of the latest survey. However, gleanings from previous questionnaires suggested that plant and equipment outlays would rise moderately throughout 1957. Some slackening in such expenditures might materialize thereafter, but the survey-takers felt that it could not be deep or long-lived in the face of the basic long-run vitality underlying the capital spending boom.

This projection of capital outlays by business is supported by regional surveys recently completed in several areas. Such findings carry special significance at this juncture since the business boom of the past two years has rested heavily on the tremendous expansion in the capital goods industries. Furthermore, the strong demand for credit to help finance the capital goods expenditures has limited the expansibility of credit for other uses such as residential construction.

$$C = -46.8 + .618(W_t) \ldots$$

At the opposite extreme as a forecasting device was the statistical "model" of the domestic economy to which the Conference was introduced. Basically the model is a set of twenty-two equations, describing the short-run relationships between important variables (e.g., consumption expenditure) which are deemed to play active roles in shaping the level of over-all economic activity. Which factors are chosen, and precisely what are their mathematical relationships, are subjects of continuing study in the University's Seminar on Quantitative Economics. The statistical model is a device for supplying concise answers to specific questions, based upon the past experience of the American economy as recorded in statistical records. Fed a dozen triggering assumptions concerning 1957, the model generated an "answer" concerning probable over-all output which coincided closely with estimates presented by other speakers.

The record of accuracy of the model in its five years of operation is intriguing—often remarkably accurate yet occasionally very much in error. For example, it predicted total national output within 1 per cent for the years 1953, 1954 and 1956; yet in 1955 its estimate of gross national product was a 4 billion rise instead of the 30 billion gain which materialized, and the calculations were relatively as much in error for several key sectors of over-all activity in one or more years.

Special markets

Besides attention to the broad picture, the convening forecasters spent a good bit of time discussing some particular markets within the economy which were believed to hold significance for the pace of activity in 1957. A labor specialist described the labor market outlook for the coming year as one of continued advance in wages with probable drives for a shorter work week and added fringe benefits; at the same time, the relative lack of major wage contract terminations foreshadowed a year of comparative labor peace.

A similar intensive look at the consumer instalment credit market led to the expectation of a further rise, albeit of moderate dimensions, in the coming year, in line with expected new

passenger car sales of 6.5 to 6.7 million units at retail.

Finally, conditions in the markets for money and credit were analyzed. Outstanding in this picture was the striking dimension of demands already placed upon such markets and the probability of some further net increase in borrowing in coming months by most credit users other than the Federal Government. Attention focused also on the sharp reductions in corporate and bank liquidity which have occurred over the past two years and on indications that some liquidity positions might be approaching a practical minimum. The result is to make the banking system far more responsive to changes in over-all monetary policy from now on than it has been up to now.

A consensus

As the fruits of two days' discussion were reviewed in the concluding session, the business analysts found themselves with considerable areas of general agreement. No one foresaw a substantial downturn in 1957, nor did anyone see a serious inflation immediately ahead. The consensus seemingly lay close to the estimates presented at the outset: total output up 5-6 per cent, about half of which might stem from price increases. However, there were some clouds remaining on the horizon. Some feeling persisted that present capital spending levels might be subject to cutback if either profit margins continued their recent narrowing trend or credit conditions were allowed to become excessively stringent. A more vague cause of uneasiness was the delicate international situation. The economists had little choice but to base their judgments on the assumption of no significant change in that turbid area. The realization existed, however, that such an assumption might not be correct and that any major change could have rapid repercussions on the pace and direction of domestic business activity. With this usual note of uncertainty but an unusually large area of agreement, the forecasting conference for forecasters came to a close.

Saving on the uptrend?

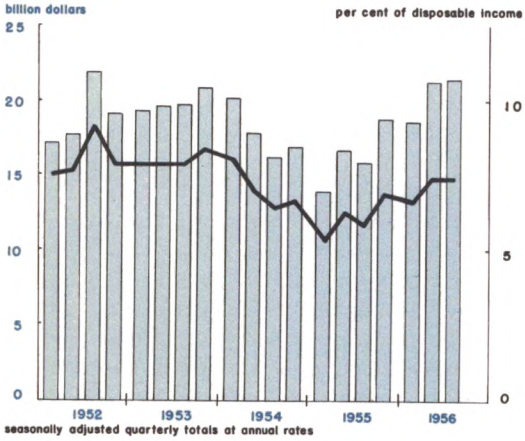
From late 1953 to early 1955, American consumers showed a marked tendency to spend more and save less. The annual rate of new personal saving declined more than 3 billion dollars even though consumer income was rising steadily. Thus, income channeled into savings during this period represented a *declining* portion of a *rising* income stream.

Beginning with the first quarter of 1955, however, personal saving has reversed its downward trend and now is an *increasing* portion of the *rising* total income. Preliminary estimates put saving during the second and third quarters of 1956 at an annual rate of 21 billion dollars—the highest since the fourth quarter of 1953. At this rate, the amount of new personal saving for the first nine months of 1956 was nearly one-third greater than for the same period last year.

For the nation's commercial banks, evidences of the pickup in saving activity have been a more recent development. Gains in time deposits, largely savings accounts, in these banks barely kept pace with the previous year's growth during the early months of 1956. Around midyear, however, the growth began to quicken, and by the end of the third quarter, the rise had exceeded 1½ billion dollars, roughly one-third more than the nine-month increase during 1955.

Time deposits in Midwest commercial banks have followed essentially this same pattern.

Personal savings increased in 1955-56, still below 1952-53 as per cent of income



One of the most comprehensive of the many different measures of personal saving in common use is provided by the Department of Commerce. This measure, which is charted above, is derived within the framework of the national income estimates and is the difference between personal income after taxes, i.e. disposable income, and personal consumption expenditures for goods and services. The accuracy of this "residual" measure of personal saving is, of course, dependent upon the accuracy of estimates of the two much larger quantities, income and spending. Also, "saving" in this sense is a broader concept than the term itself generally suggests. All uses of current income other than for consumption expenditures in a given year (such as debt repayment) add to savings while expenditures financed by other means than current income (such as borrowing) subtract from savings.

Within this framework, net additions to personal holdings of liquid assets such as currency and deposits, savings and loan shares, Government bonds, and municipal and corporate securities are viewed as savings. Increased equities in private life insurance and pension funds are also classified as saving. New investment in housing and in plant, equipment and inventories of unincorporated businesses and farms is included, after allowance for depreciation on existing property. Finally, repayments of consumer, residential mortgage and unincorporated business and farm debt add to personal saving while additions to such debt are counted as subtractions from saving.

Through May, deposit growth lagged behind the year-ago pace. Recently increases have exceeded by a substantial margin the comparable 1955 rise. As a result, time deposits gains have caught up percentagewise with the rise in over-all personal saving. To the banker, the rise in time deposits may appear less impressive because of the continuing strong demand for bank credit. As in most savings institutions, the recent increase in flow of new savings seems a trickle compared with the flood of loan demand.

Exact measurement of growth in the savings deposits of individuals is somewhat restricted by the inclusion in time deposit totals of accounts other than regular savings. Time certificates of deposit, savings club funds, trust department accounts and various other types of time accounts are included in the over-all figures. Their share of the total dollar volume, however, is small enough to have little influence on the measures.

Savings deposits in the Midwest

For commercial banks in the major Midwest centers, a monthly survey of regular savings deposit trends provides more direct and detailed evidence of what is happening to this form of personal saving. Recent results of this survey show that not all areas have shared in the upturn of commercial bank savings deposits. Among the Seventh District's 44 centers (excluding Chicago) for which figures for the first three quarters are available for both 1956 and 1955, 19 showed net gains in savings balances greater than in 1955. In an additional three cities, deposits declined less this year than last. But in the remaining 50 per cent of Midwest areas, such balances showed either smaller net gains or larger net declines than in the comparable period of 1955.

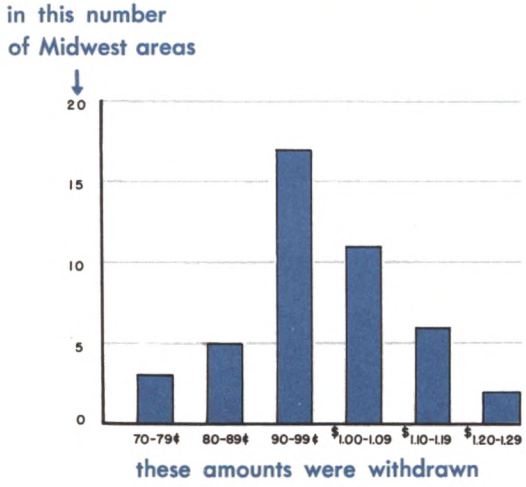
Among the major metropolitan areas, both Milwaukee and Indianapolis banks showed a net rise in savings deposits for January through September 1956 compared with a net decline in the first three quarters of 1955. Savings balances in Des Moines banks, while continuing to rise this year, fell somewhat short of their

1955 gains. Detroit was the only large Midwest city to show a decline—about twice as great in dollar volume as the rise for the first nine months of 1955. Among the smaller centers, even greater diversity appears. In the aggregate, commercial bank savings balances for all cities excluding the District's two largest cities—Chicago and Detroit—showed a somewhat greater rise in January through September 1956 than in the comparable period last year.

Many factors typically influence the growth of commercial bank savings deposits in any given area, including the amount of funds going into competing forms of saving and the tempo of local business conditions. But recent growth of savings deposits in Midwest banks appears to reflect strongly the widespread increases in interest rates paid on savings balances. In many cases, interest rate differentials seem to be an important—if not the sole—factor in explaining divergent growth trends in commercial bank savings balances among Midwest areas.

A consideration of the gross flows affecting savings balances sheds further light on recent trends in savings deposits in Midwest commercial banks. In 28 of the 44 cities, the total *inflow* of new savings (deposits) exceeded last year's volume during the first three quarters of 1956. However, the total *outflow* of savings (withdrawals) has also risen, exceeding the year-ago rate in commercial banks in 31 cities. In fact, in numerous cities, withdrawals have increased enough to more than offset a rising inflow. Commercial banks, of course, have been but one of the major kinds of savings institutions with rising turnover in savings funds during recent months. Increasing competition for the savings dollar has resulted in a general rise in the rate of turnover of such funds.

For every dollar deposited in savings accounts during Jan.-Sept. 1956



Other liquid savings

Not all forms of saving have exceeded their year-ago growth. Growth in time deposits in the nation's mutual savings banks, for example, was slightly less than in the first three quarters of 1955. While savings deposited were 4.8 per cent above 1955 levels, withdrawals were up 5.5 per cent, for a smaller net gain.

Net increases in savings accounts in savings and loan associations throughout the nation during the first eight months of 1956 exceeded gains in the comparable period of 1955 by only 6 per cent. Here again, while a record amount of money was deposited, withdrawals also increased substantially. Among the four largest Midwest areas, Chicago and Detroit showed net increases in savings capital of insured savings and loan associations substantially in excess of that of a year ago. In Milwaukee and Indianapolis, on the other hand, growth fell moderately short of the 1955 rise.

Cumulative sales of E and H savings bonds in the nation through August were roughly 3 per cent below the year-ago total. The excess of such sales over redemptions was only 300 million dollars compared with 570 million in 1955. About 75 per cent of Midwest centers reported combined E and H savings bond sales below a year ago during the first eight months. Among the remaining 25 per cent, increases ranged from less than 1 to more than 16 per cent. In the aggregate, District area sales ran slightly more than 5 per cent under a year ago.

Year-to-date gains in these particular forms of liquid savings were not alone in falling short of the rise in over-all personal saving. Saving

through private insurance, which is usually based upon a contract and is subject to less variation than the foregoing kinds of saving activity, was slightly below the year-ago gain through August.

Securities holdings up

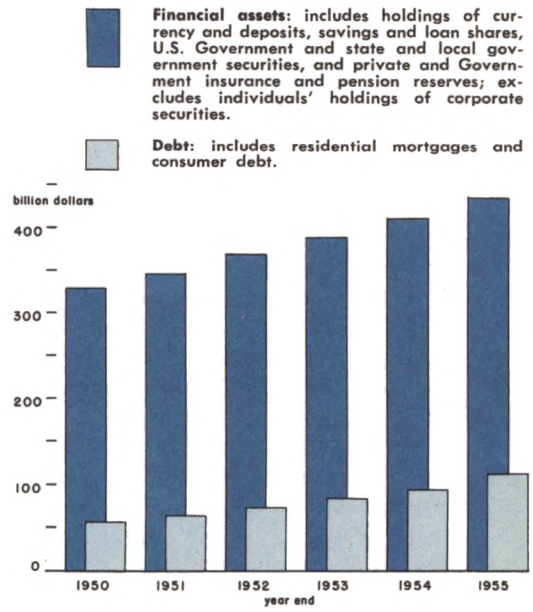
The question then arises as to what form the recent upturn in personal saving has actually taken. The higher level of commercial bank time deposits alone accounts for not much more than 10 per cent of the indicated gain.

From figures recently published by the Securities and Exchange Commission for the first half of 1956, increases in security holdings of individuals appear to be a major factor in the saving upturn during this period. Whereas new U. S. savings bond holdings lagged behind last year's level, holdings of other U. S. Government securities were greater. These holdings, plus increased investment in corporate and other securities and state and local government obligations, accounted for well over half of the 3 billion dollar increase in liquid savings estimated by SEC for the first half of the year. It should be noted, however, that much of this new investment, particularly in government issues, was made by nonprofit organizations and personal trust funds, rather than by individuals as such.

Consumer indebtedness down

A second major factor in the rise in personal saving is the decline in the purchase of automobiles. Inasmuch as credit normally plays a major role in car buying, the effect upon saving has been double-barreled. With the reduction in spending for automobiles from the peaks reached during 1955, the volume of new consumer borrowing also has declined. Moreover, repayment of such debt contracted in 1955 and prior years has continued to mount. Both factors have resulted in a slowing down in the rate at which consumers add to their outstanding debt, which in turn has increased saving. Viewed in a different way, with personal income after taxes rising more rapidly than consumption expenditures, mainly because of reduced purchases of autos, the residual of income after expenditures, i.e. saving, has increased.

Debt becomes a more important offset to financial assets of individuals



For the first half of 1956, consumer indebtedness increased less than 1 billion dollars, in the SEC estimates, compared with roughly 2⅓ billion in the same period last year. That consumer debt was not an even smaller offset to personal saving this year is due largely to the fact that credit extended for car purchases has not declined as much as auto sales. The drop in auto sales during the first six months was heaviest in the cash sales.

Prospects

Whether or not the apparent revival in personal saving will be sustained depends, as always, on the collective decisions of consumers. Saving is typically a volatile quantity influenced by numerous factors including changing consumer needs, income, assets, indebtedness and, quite importantly, expectations.

Viewed against the whole post-World War II experience, the currently rising ratio of sav-

ing to disposable income may represent a return to a more "normal" relationship between these two measures. Even the relatively high rate of saving at midyear represents no more than the average percentage of disposable income saved during the period 1951-54. The second and third quarter ratios of roughly 7½ per cent could increase further in the months ahead without exceeding the levels established as recently as the 1951-53 period. On the other hand, if consumers should decide to increase their spending relative to income, say by borrowing to buy more automobiles, the saving rate would again ease off. In any case, what happens to consumer indebtedness is likely to be the key to future trends in saving activity.

Liquid assets and bank liquidity

Bankers face the same investment considerations that confront businessmen and individuals, except on a generally more pressing basis. For a consumer, his potential investment outlets are legion—cash, savings bonds, time deposits and common stocks, to mention only a few. How does an individual decide which of the alternatives to choose and in what proportions? Many times this decision is made by whim or even by default. More often it is based on an implicit recognition of the paradox raised by different forms of investment, while in other cases these conflicting factors are carefully weighed.

The investor's paradox can be briefly stated: more liquidity means less earnings; more earnings mean less liquidity. At the extreme, the asset with perfect liquidity—cash itself—yields no income at all. Other liquid assets, those that can be readily converted into cash with little risk of price fluctuations, usually rank just above cash in the lower end of the interest scale. Conversely, if an investor prefers a high yield on his funds, he must be willing either to hold an asset not readily salable or one that may undergo large price swings in the market.

An investor may be willing to give up a high return in favor of liquidity for several reasons. First, the funds may be tagged for some specific purpose and may have to be paid out shortly. Second, an individual or businessman may want to be in a position to take advantage quickly of profitable business opportunities that may arise. And, third, he may desire to be able to meet any unexpectedly large outlays he may be called upon to make. These factors will sway most investors to keep at least a portion of their funds in liquid assets.

For bankers, decisions on what to do with the funds received both from depositors and from repayments on outstanding obligations are of vital importance. Earnings on loans and investments are a bank's lifeblood. In 1955, income on earning assets accounted for 90 per cent of net current earnings. On the other hand, a bank must be prepared for any large-scale drain on its deposits. Demand accounts, which must be paid to depositors upon request, amount to 64 per cent of the liabilities of the nation's commercial banks. No other business or institution has such a high proportion of callable obligations. A banker therefore must manage his funds in such a way as to hold sufficient liquid assets and yet cover his costs and earn a reasonable profit for his stockholders.

What are liquid assets?

The usual definition of bank liquid assets includes a variety of balance sheet items. "Cash assets"—currency held in vaults, balances with correspondent banks, reserves on deposit at the Federal Reserve Banks, checks in the process

of collection and short-term Government securities—are normally grouped together as the most liquid of bank assets. At mid-1956, holdings of these items accounted for a fifth of total bank footings.

The largest portion of such holdings, however, is essential to the functioning of the bank and hence in an operating organization cannot be transferred to other uses or paid out to depositors without replacement. For example, of total reserves that members keep in their account at their Reserve Bank, 97 per cent are legally required to be held at all times, while only 3 per cent represent excess reserves, or funds that can be paid out. Moreover, a bank must always keep on tap enough coin and paper money to satisfy its customers' demand for hand-to-hand currency. Deposits with correspondent banks likewise do much to facilitate banking transactions. On the record, vault cash and correspondent balances have either increased slightly or remained virtually stable over the past two years of surging demand for bank loans. Although this indicates that banks are carrying on a substantially larger business on very little more additional working capital, it also indicates that they have felt unable to reduce these assets to accommodate additional credit demands.

Thus, we come down to the short-term investment issues as the predominant assets that banks hold as a liquidity cushion. At the end of last June, Treasury bills, which mature in three months from their issuance, and certifcates—issues that have a year or less maturity —made up less than 2 per cent of bank assets.

Liquidity is relative

All earning assets of commercial banks have some degree of liquidity, though they do not measure up to bills and certificates in the dual criteria of salability at a relatively stable price. In what sense are they liquid? Some assets are readily marketable, such as intermediate- and long-term Governments, but at a market price that may fluctuate widely. A change of one-half of a percentage point in the yield on an outstanding 5-year bond, for instance, is reflected by a change of over 2 per cent in its market price. Over the past two years, the yield on such issues has increased about 1½ points. VA- and FHA-guaranteed mortgages are also examples of assets readily salable at a price determined by the supply of and demand for such instruments. Typical FHA mortgages now sell for around $97 per $100 face value, whereas in the very easy credit conditions of June 1954, their market price was only a half of a percentage point below par.

The VA- and FHA-backed obligations contain another element of liquidity. These obligations are paid in instalments, so that they provide a continual stream of repayments, thus generating funds available for reinvestment. Similarly, repayments upon maturity give "terminal" liquidity to any loan or investment which a bank may hold. At Midwest banks, for example, over one-third of all bank loans to business mature within three months. Within six months, more than 60 per cent of such business outstandings come due. But much of this is credit that will not actually be repaid as scheduled. Both lender and borrower fully expect that many business loans now on the books will be renewed at maturity. According to a recent study by the Federal Reserve Bank of Cleveland, 75 per cent of all loans made for less than three months are renewed. Moreover, it is often considered poor customer relations for a bank to call demand loans, which make up 7 per cent of Midwest bank portfolios. Nonetheless, the stream of cash repayments flowing regularly into the nation's commercial banks is large by any standard.

These two dimensions of bank asset liquidity —salability and periodic repayment—are basically supplementary. But they may change in opposite directions under the influence of shifting economic conditions. Interest rates generally rise in periods of rising economic activity, thus reducing the market price and, hence, the liquidity of outstanding intermediate- and long-term Government securities as well as other fixed coupon-rate issues. On the other hand, the ability of business and consumers to repay their obligations promptly is ordinarily enhanced by

Bank portfolios show sharp swings over past two years

	Price range		Distribution of earning assets							
			All commercial banks		Central reserve city banks		Reserve city banks		Country banks	
	1954-to-date		Mid-	Mid-	Mid-	Mid-	Mid-	Mid-	Mid-	Mid-
	High	Low	1954	1956	1954	1956	1954	1956	1954	1956
	(per $100 face value)		(per cent of total)							
Callable loans			5	4	13	13	6	7	5	6
Salable assets										
Treasury bills			3	2	4	1	3	1	3	2
Treasury certificates	100.95	98.60	4	1	3	*	3	1	4	1
Treasury notes	100.34	96.22	8	8	8	5	9	8	8	9
U. S. bonds	100.32	92.19	28	25	25	20	27	23	28	26
Other securities	100.32	87.40	11	10	10	9	10	9	12	11
FHA- and VA-guaranteed mortgages	99.5	97.1	5	5	1	1	7	7	6	6
Total			59	51	51	36	59	49	61	55
Nonsalable assets			36	45	36	51	36	44	34	39

*Less than .5.

Note: Prices are based on the following obligations—Treasury certificates: hypothetical 1-year 1½% issue; Treasury notes: 1⅞%, 2/15/59; U. S. bonds: 2½%, 9/15/67-72; other securities: hypothetical 20-year 2¼% issue; FHA- and VA-mortgages: prices on sales of typical FHA-guaranteed mortgages.

prosperity. Similarly, falling interest rates and rising security prices generally accompany a downswing in business conditions, at the same time that borrowers are less likely to be able to meet their scheduled payments. In planning for the utilization of cash flows, banks have to give careful attention to the shifting liquidity character of their assets as business and credit conditions change.

Liquidity in the boom

Over the past two years, the demand for loans has expanded sharply. Between September 1954 and September 1956, outstanding loans at the nation's commercial banks showed a gain of 20 billion dollars, or 30 per cent. Over the same time span, total bank assets rose by only 14 billion dollars. The boost in loans over and above the growth in total bank loans and investments was made possible by substantial reduction in bank holdings of Government securities. Treasury issues in the portfolios of commercial banks now total 57 billion dollars, about 10 billion under the September 1954 level. This represents 35 per cent of total loans and investments, the lowest percentage figure in the postwar period and a drop of 8 percentage points from the third quarter of 1954.

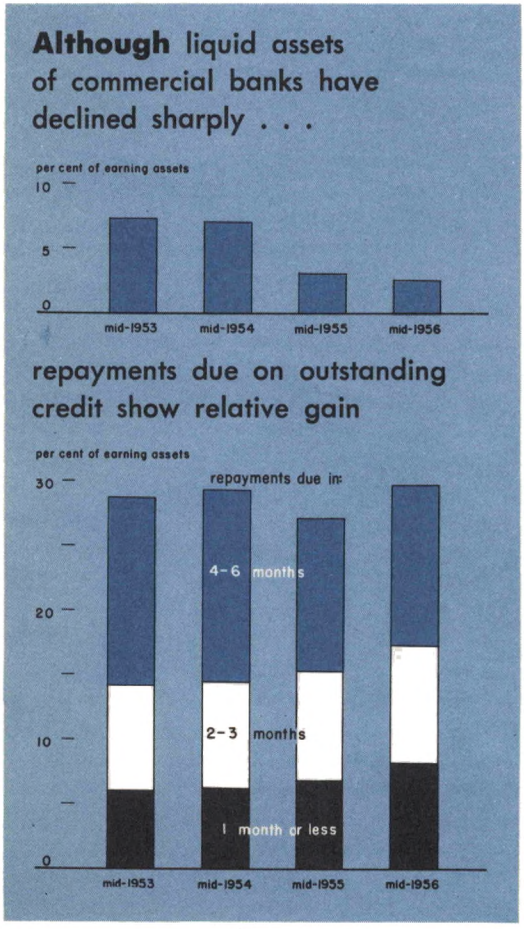
Moreover, in the two years ending in mid-1956, virtually all of the decline in bank holdings of Treasury issues was recorded in the within-one-year maturity class. These securities —bills and certificates plus notes and bonds maturing within 12 months—represent 9 per cent of all loans and investments at midyear, compared with 14 per cent two years earlier.

The drop in liquid assets has been sharpest in the nation's largest banks (see table). These lenders generally hold their excess reserves as close to zero as possible, regardless of loan

demands. Smaller banks, as typified by the "country" bank group, ordinarily maintain reserves well above those required, the amount of surplus reserves fluctuating with changes in the credit picture. Excess reserves at country banks, after reaching a recent peak of 740 million dollars in August 1954, dropped 270 million in the following two years.

The large and medium size banks have also been faced with a bigger boost in their outstanding loans. Borrowing at country banks has increased by a fourth between mid-1954 and mid-1956, while all other members have registered a 34 per cent climb.

Moreover, the large banks, while increasing their loans by a third, have barely shared in the increase in deposits since 1954. Though total deposits of all commercial banks have increased by 12 billion dollars, or 7 per cent, those at central reserve city banks have risen by a mere 2 per cent.



While liquid assets of commercial banks have dropped substantially, the stream of repayments has grown enough in dollar terms to maintain virtually the same relation to earning assets (see chart). A boost in the return flow of funds from the large increase in commercial and industrial loans, with a sizable portion coming due within half a year, has been largely offset by an increasing share of assets going into the long-lived real estate mortgages and by a slight extension in the average maturity of consumer instalment loans.

New situation

These developments have placed the banking system in a position which is more or less unique by postwar standards, As a result of the recent decline in their liquid assets, commercial banks are more sensitive to monetary policy. For one thing, they are increasingly dependent upon the continued growth in deposits as a means of expanding their outstanding loans. Moreover, a further rise in interest rates would mean an additional drop in the market price of medium- and long-term issues.

Banks are also influenced to a greater extent by changes in the economic climate. With debt repayment a larger factor in bank liquidity, the ability of borrowers to maintain payment schedules becomes correspondingly more important.

The banking system today, however, remains much more liquid than it was 25 to 30 years ago. In addition, many safeguards have been set up to ward off the type of debacle that occurred in the early Thirties. Deposit insurance, stock margin requirements, more careful bank examination and supervision and the like have all strengthened the nation's monetary structure. Moreover, the Federal Reserve System is in an improved position to supply the banking system with the liquidity necessary to forestall financial crisis.

Irrigation in the Midwest

Artificial watering of growing crops traces back through antiquity to the transition of mankind from pastoral societies to agrarian cultures. The ancient pyramids of Egypt, for example, were erected by workers fed through the use of a crude type of irrigation. The occasional introduction of new techniques has enabled the practice to persist and spread throughout its history of several thousand years. A relatively recent method—sprinkler irrigation—shows signs of giving the old usage one of its most spectacular boosts.

A farm equipment trade publication has estimated that by 1960 a total of 400,000 farms in the U.S. will be irrigating 40 million acres, about 10 per cent of our cropland. In 1954 some 300,000 farms irrigated less than 30 million acres. This projected increase would require the investment of something like 500 million dollars in new capital, most of it for sprinkler irrigation equipment. Although the above projection may be overly optimistic, it nevertheless indicates the potentialities that this development may contain.

Arid and humid areas

In the United States irrigation was largely confined to the arid West until recently. In that area the predominant method of applying the water involved the flooding of fields from canals and trenches supplied by river reservoirs, or deep wells in some cases.

Although east of the Great Plains average annual precipitation is sufficient for most Temperate Zone crops, the moisture supply varies considerably from year to year, as does its distribution within the year. Hence, even in humid areas natural precipitation does not guarantee a fully adequate moisture supply throughout a crop's entire growing season. This can cut the yield substantially, especially if the water deficiency occurs at critical stages in the plant's development. Consequently, the output of many crops can be raised considerably by irrigation even in humid areas.

Artificial watering on a commercial scale is a rather expensive practice. Installation of the equipment requires a large investment outlay, and annual costs of operating the equipment are high. For this reason, in the eastern half of the U.S.—where irrigation is not subsidized by Government-developed water supplies—the usage gained its first footholds in areas specializing in the commercial production of vegetables, because these return a high value of output per acre and are especially sensitive to a steady supply of moisture.

In this part of the country, the water is typically applied by sprinklers—large-size relatives of the type commonly seen watering lawns. The water is obtained from wells, streams or ponds and is pumped to the sprinklers through portable pipes. Where a considerable area is involved, the apparatus is moved around the field in order to supply moisture to all parts of it. Obviously, the development of lightweight aluminum pipe has been a boon to this activity.

Sprinklers spreading swiftly

In 1954, according to the Bureau of the Census, a total of 2.6 million acres of farmland was irrigated in the 31 states east of the Great Plains, i.e. east of a line from North Dakota to Texas. Although ten times as many acres were irrigated in the West, the total in the humid region represented a jump of 73 per cent during the previous five years, compared with an increase of only 10 per cent in the West. In the humid area, very large percentage gains were scored by a number of states along the Atlantic Seaboard and in the Appalachian and Delta regions, as well as in the Corn Belt states of Missouri, Ohio and Illinois.

Irrigated acreage in Illinois leaped from 1,510 acres in 1949 to 6,789 in 1954. (Total cropland harvested in Illinois comes to about

Irrigated acreage in District states

Size of farm	Acres irrigated 1949	Acres irrigated 1954	Total crop acres 1954
	(thousand acres)		
Under 100 acres	7,067	11,251	7,438,963
100 to 219 acres	5,065	12,497	30,036,641
Over 219 acres	20,531	38,847	34,360,277
Total	32,663	62,595	71,835,881

SOURCE: U.S. Bureau of the Census.

20 million acres.) Several other states in the Seventh Federal Reserve District had earlier experience with the practice. Michigan and Wisconsin had significant amounts of irrigated acreage already in 1949 (see chart). Nevertheless, those acreages nearly doubled in the succeeding five years, with most of the increase occurring on fruit and vegetable farms, the types that previously had accounted for most of the irrigation in that region. In Illinois, Indiana and Iowa most of the gain in sprinkled acreage occurred on cash grain (primarily corn) farms, although Indiana also showed a significant addition on grain and meat animal farms.

Irrigation in the Seventh District is not primarily a small farm phenomenon. In both 1949 and 1954 the bulk of the sprinkled acreage was found on farms exceeding 219 acres in size. However, the largest percentage increase between those two dates occurred on farms in the 99-219 acre size class which includes the majority of District farms.

Water and corn

A considerable amount of experience has now accumulated concerning the irrigation of corn in the Midwest. Purdue University specialists report that irrigation "doubles and triples" corn yields in some sections of Indiana. A three-year test in northern Illinois showed an average corn yield of 144 bushels per acre on sprinkled land against a 50-bushel yield on nonirrigated soil. In a four-year Wisconsin test nonirrigated corn averaged 45 bushels per acre whereas full irrigation *plus heavy fertilization* boosted the yield to 96 bushels. Tests by Iowa State College on heavy Iowa soils in 1955 showed an average gain of 40 bushels per acre due to irrigation.

These tests were conducted for periods of only one to four years, whereas a longer span of time would be desirable for conclusive results. However, an Iowa study of rainfall records has disclosed that there were an average of more than three "dry periods" in June, July and August each year during the past 20 years at Ames. A dry period was defined as 10 or more consecutive days during which there was no more than one-quarter inch of precipitation on any day. "Every year in the past 20 had at least one period of 13 or more days with no effective rainfall; sometimes these periods last 20 days or longer."

This State study suggests that irrigation of corn might be warranted merely from the standpoint of supplying supplemental moisture during dry spells. However, an important additional advantage of artificial watering lies in the fact that it permits other changes in crop production practices. For example, it has been known that highest corn yields can be obtained from good soils if heavy applications of fertilizer are used along with dense stands of plants, i.e. more than 15,000 per acre. However, moisture deficiency can sharply reduce the effectiveness of fertilizer, and dense stands may actually reduce yields in dry years. The sheer threat of inadequate water—that is, the mere uncertainty connected with lack of irrigation—undoubtedly has held planting and fertility practices below optimum levels. Several observers report that installation of irrigation equipment usually should be accompanied by a 50 to 100 per cent boost in fertilizer application in order to utilize soil potentialities most fully. "For best results, fertility, water and plants per acre should all be high."

It takes money

In view of the results obtained through irrigation, it may seem surprising that the practice is not already more widespread in the Midwest. Undoubtedly part of the explanation is provided

by the cost of the necessary equipment. Pump, pipe and sprinklers cost from $40 to $80 per acre irrigated, depending on the location of the water supply, the layout of the fields and the farmer's taste in machinery.

The cost of obtaining the water supply is even more variable. Irrigation requires a lot of water; almost 30,000 gallons are needed to cover one acre with one inch of water. Sprinkler systems in this region vary considerably in capacity, squirting from 200 up to 1,500 gallons per minute. At the rate of 500 per minute it takes about one hour actual sprinkling time to cover an acre with an inch of water.

Sometimes the water is secured from streams that flow throughout the year, and sometimes small reservoirs are constructed to impound surface runoff in rainy seasons. Frequently shallow wells or sump holes are dug near creeks to utilize both surface runoff and underground water. Where the flow from these holes is small, the water is pumped into reservoirs over a period of time with the supply being drawn down when irrigation is necessary. Other systems rely exclusively on underground water, although some of them also utilize small reservoirs for storage.

Most of the Seventh District is underlaid by water-bearing strata yielding more than 50 gallons per minute to individual wells of suitable depth and dimensions. Moreover, the ground water level is close to the surface in the Midwest, compared with the West where deep wells are also used to some extent to provide irrigation water. Some Midwest farms have underground supplies capable of yielding more than 800 gallons per minute from a single well. It is the judgment of authorities that irrigation as currently practiced in the Midwest is feasible for a high percentage of farms in this region.

If the required water can be secured from a stream, pond or shallow well, the cost of securing the supply may be relatively low. However, the cost mounts rapidly if a deep well with a wide bore, sometimes up to three feet in diameter and several hundred feet deep, is required. A deep well may cost $5,000 or more. It behooves a farmer to seek technical advice before having such a hole drilled; its particular location can make a lot of difference in the cost. Also, the water laws should be investigated before a large investment is made in an irrigation system. Although these laws are quite indefinite in most Midwest states, in general they prohibit one user from interfering with normal uses of other users.

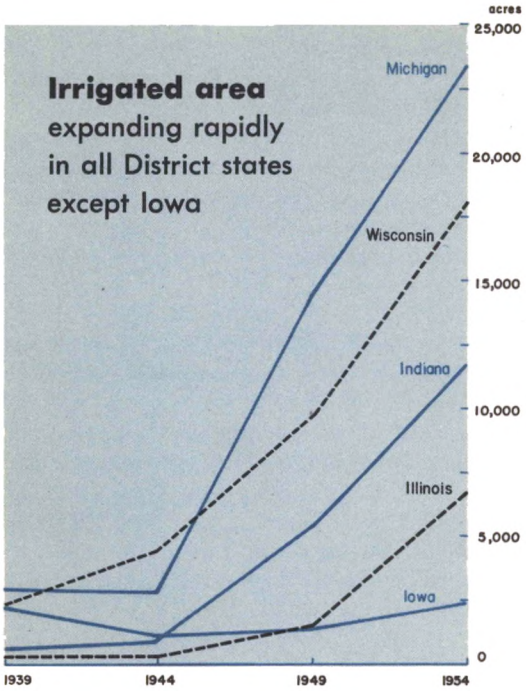
Complete sprinkler systems—water supply plus distributing equipment—require an investment of from $40 to $200 per acre, with the average around $90 in the Midwest, according to a company which fabricates and installs the equipment.

Various authorities are pretty well agreed on the annual cost of operating a sprinkler system. Iowa State College places the figure between $20 and $30 per acre. A company that sells the apparatus estimates average annual cost per acre for a typical installation in this region as follows:

Interest cost	$ 4.50
Insurance and taxes	.45
Depreciation	6.00
Electric energy for power	4.00
Labor	8.00
Maintenance	3.00
Total annual cost	$25.95 per acre

Although such an addition to production costs is sizable indeed, the profitability of installing a system must be appraised in view of the additional output and revenue that can be obtained through use of the practice. Assuming that over a number of years corn yields can be boosted an average of 40 bushels per acre (using the figure reported in the Iowa test results) and further assuming that the corn can be sold for an average price of $1.00 per bushel, the additional revenue produced by the innovation would amount to $40.00 per acre, $24 in excess of the added cost. Under these circumstances, the investment would pay for itself in four years. This probably explains why the use of irrigation is expanding rapidly in the Midwest despite the large investment and high annual operating cost associated with it.

Man's never-ending quest to control and im-



prove his environment has led to a continual succession of technological advances in methods of agricultural production. Successful innovations involve the altering of methods of production in such a way that the average cost of production is reduced. Income is improved for at least those farmers who adopt the usage reasonably early in the process. As the process comes into general use and the price of the product declines, the benefits tend to accrue to consumers and the whole economy shares in the gains.

Sprinkler irrigation is one of the more spectacular innovations that have been added recently to the tool kit of farming practices in this region. However, the economic effects of a widespread adoption of irrigation probably would be similar to those following most other improvements in farm technology.

The size of the individual farm business would be expanded, although in this case not necessarily the acreage. Capital investment per acre (and labor too) would be increased, and farm production would depend to an even greater extent on purchases of nonagricultural materials and services. The organization and operation of a farm business would become even more complex and difficult, and the premium on good management would be widened even further.

Because of the larger investment required to obtain an efficient farm business, fewer people who desired to obtain such a unit would be able to do so out of their own funds. Consequently, the demand for farm credit probably would expand further. Additional operating credit might also be needed to finance the higher annual outlays associated with use of the equipment.

Part of the uncertainty associated with vagaries of weather would be eliminated and total farm production would be boosted. The larger supply would tend to depress prices, but the average cost of producing a bushel of corn would be reduced for those farms which irrigated successfully. For tracts on which cost dropped more than price, land values would tend to rise, especially if permanent installations like wells and reservoirs were incorporated into the real estate. Level land with easily accessible water supplies might rise in value prior to the installation of irrigation facilities, merely in anticipation of their future use.

For the most part, these economic effects would be extensions of current trends. However, if irrigation is widely practiced in this region—and the usage is spreading rapidly at this time—those trends may be significantly accelerated.

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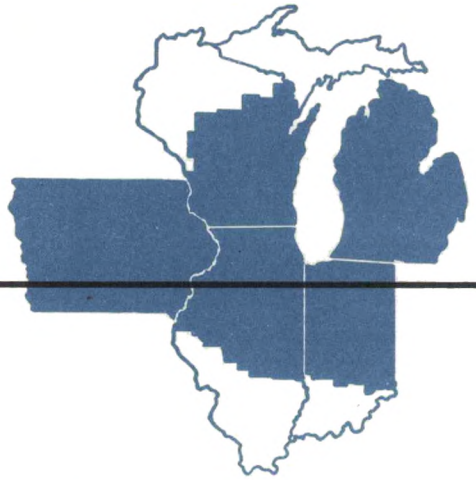

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