

monthly review

October

Federal Reserve Bank of Atlanta - 1974

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A Primer on Productivity

by **Brian D. Dittenhafer**

One basic economic problem of society, and a primary cause of inflation, is that we try to do more than resources will allow. We want to put a stop to poverty, reduce pollution, increase housing, maintain military defense, and become self-sufficient in energy. We start lofty programs to accomplish these objectives but do not always realize the claims these make on the resources of the economy. Many people do not recognize that the resources available are not limitless but accumulate only gradually. When society's demands on resources grow faster than the resources available, the bidding results in higher prices for goods, or inflation. However, if the volume of goods and services available grows more rapidly, we can raise our demands upon the economy more rapidly. The primary source of growth in resources during the past twenty years has been growth in productivity. This article explains what productivity is all about, and how its growth is related to that of the resources in the economy.

What is Productivity?

To economists, productivity refers to the relationship of output to the labor, materials, and machines (factor inputs) that are used to make the goods and services we consume. The ratio of output to factor inputs is a measure of total factor productivity, or the efficiency with which factor inputs are combined. If we were able to measure exactly how much each factor, such as labor, added to total output, we could calculate the contribution each factor makes to increasing total output. Economists refer to the ratio of total output to a single input as partial factor productivity. Exact measurement of partial factor productivity for the entire economy is impossible, but several economists have estimated the contribution which each factor (and other influences) has made to increasing output. For example, over the years, the amount of capital equipment per worker has increased and this has been a significant source

Monthly Review, Vol. LIX, No. 10. Free subscription and additional copies available upon request to the Research Department, Federal Reserve Bank of Atlanta, Atlanta, Georgia 30303.

of productivity growth. At the same time, the quality of that capital equipment has improved, and as old machines were removed, more efficient ones took their place. Thus, more machines as well as more efficient ones contributed to productivity growth and helped society produce more goods and services.

According to one estimate,¹ better utilization of men, materials, and machines has caused productivity to increase at an average annual rate of 2.3 percent during the postwar period. Estimates such as this are made after detailed and time-consuming study in an attempt to measure the precise contribution of each separate production factor. To obtain more current productivity estimates, a simpler process is used. We simply count the number of man-hours worked and use the total as a substitute, or proxy, for other measures of factor inputs into the economy. Current estimates of total output are also made on a routine basis, so it is relatively easy to estimate labor productivity by forming the ratio of real output to number of man-hours worked. There are technical problems in measuring both the labor input proxy and the total output proxy (see box); but, in general, output per man-hour provides a reasonable estimate of goods produced per hour of labor worked.²

Why Does Labor Productivity Change?

The productivity growth rate changes from year to year and even from quarter to quarter. Influences on productivity growth can be classified as either short term (having quick impact on output and productivity) or long term (when more fundamental forces are at work). Short- and long-term forces are at work simultaneously, but the sudden changes in productivity growth rates graphically portrayed in Chart I provide evidence that short-term influences are powerful and can easily overwhelm long-term forces.

Short-Term Influences

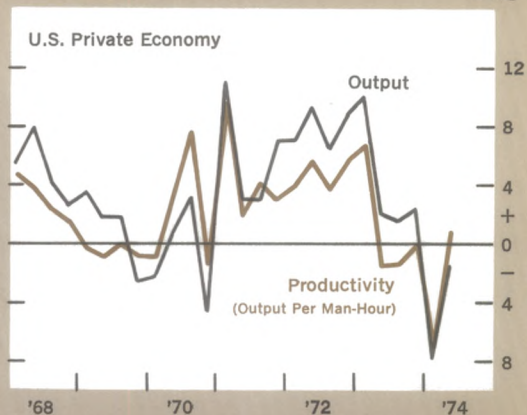
Labor productivity usually declines during a business slowdown and increases during business expansions (see Chart II). In a business slowdown, employment usually declines, but not as much as production. Some workers lose their jobs; but many skilled individuals, who would be difficult or expensive to replace if they were laid off, are retained even when they are not needed for current production. Output declines more than man-hours worked, causing output per man-hour to decline. Partially offsetting

¹John W. Kendrick, *Postwar Productivity Trends in the United States, 1948-1969*, National Bureau of Economic Research, New York, 1973, p. 39.

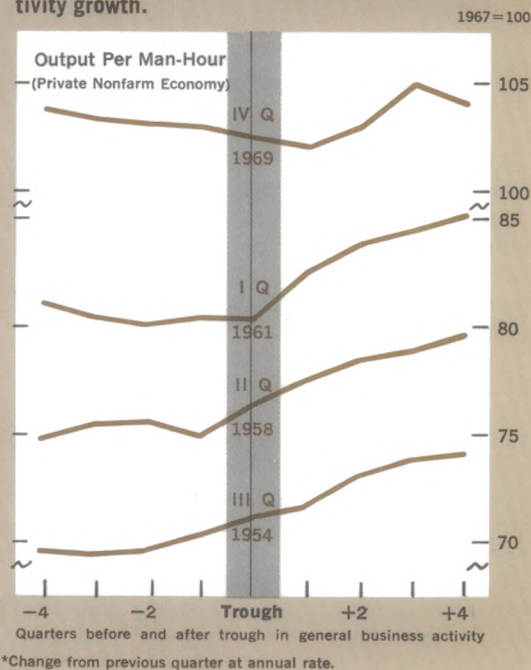
²Throughout the rest of this article, unless otherwise stated, the term "productivity" refers to output per man-hour as measured by the U.S. Department of Labor, Bureau of Labor Statistics.

CHARTS I & II

Productivity growth rates change quickly, accompanying changes in output, % Chg.*



... causing a strong cyclical pattern in productivity growth.



this decline is the general tendency of employers to release less efficient workers first and to rehire them last. Therefore, when employment declines, the general quality of the work force increases. Further offsetting the productivity decline during a business downturn is the shortening of the average workweek. Working fewer hours, employees are generally less fatigued and work faster, increasing output per man-hour.

During a business expansion, output grows more rapidly than employment, and man-hours worked are spread over many more units of output. Therefore, as output increases, average productivity

SOME MEASUREMENT PROBLEMS

On a practical level, the measurement of output per man-hour is more complicated than simply dividing the total of real output by the number of man-hours worked. Only two of the many problems of measuring productivity change are mentioned, but they serve to illustrate the nature of others which exist in measurement of productivity.

The U. S. Department of Labor, Bureau of Labor Statistics (BLS), collects and compiles the output per man-hour data for the national economy. In these measures, output per man-hour is the ratio of the real value of goods and services produced to man-hours of all persons employed, including proprietors and unpaid family workers. The BLS uses man-hours paid rather than man-hours worked as the measure of labor input. The differences between the two concepts is small, but probably widening because of the trend toward more paid vacations, sick leave, and holidays.

Another problem is encountered in calculating

output. The measure of output used is the real Gross National Product (GNP) originating in the private economy. Economists identify useful output by observing what people are willing to buy. Accordingly, real GNP is the final market value of goods and services produced in the economy expressed in dollars of constant purchasing power. The market criterion introduces a fundamental bias into productivity calculations, because market price does not measure nonmarket benefits which contribute to society's well-being. A vivid example is available in pollution-control equipment expenditures. These do not result in greater output of marketable goods and, therefore, do not improve productivity. In fact, since they probably lower capital available for directly productive machines, pollution-control expenditures probably lower the long-run output and productivity growth rates. But few would deny that spending for pollution control contributes to real income by improving the quality of life.

also increases. Acting to offset these productivity gains, to some extent, is the hiring of new workers who are relatively inefficient during the training period before they become fully integrated into the work force. Lengthening the work week also increases worker fatigue, reducing productive capacity.

Long-Term Influences

While short-term changes in total productivity over a year or two are generally caused by ups and downs in output and employment, the factors affecting long-term productivity are more basic and occur more slowly. In a general sense, these factors are the amount of equipment that can be used efficiently (capital), the quality of that equipment (technology), the quality of the labor force using that equipment (education and training), and the efficiency with which production factors are combined (resource allocation).

Researchers generally agree that, during the postwar period, more capital has contributed between 20 and 30 percent to growth in total productivity and that improvements in the quality of the labor force, largely the result of education and training, have accounted for another large chunk. Estimates of the contributions of better education and training to total productivity growth range from 10 to 30 percent. Estimates differ because it is difficult to separate and measure the effects of a larger quantity of a factor input as opposed to a higher quality of that input. For example, it is

difficult to isolate the effects of quantity and quality when a growing firm installs one new machine for two of lesser quality. Estimates also vary with the number of sources of economic growth analyzed by the researcher. For example, the greatest contribution to total productivity is generally credited to technology, the result of new discoveries and new techniques for increasing output. However, technology's contribution is usually not measured directly but is estimated as the unexplained growth in production after all other factors are taken into account. Most researchers agree that both improvements in labor force quality and technological advances are dividends on society's investment in education. Increases in research and development expenditures result in inventions of new techniques and more efficient ways of production. (Chart III shows how one prominent researcher has determined the major sources of long-term total productivity gains.)

Still another factor responsible for productivity growth has been the reduction in hours worked in low efficiency sectors and the increase in hours worked in high efficiency sectors. In the U. S. economy, this effect has been most noticeable in the shift of labor out of farming. The actual amount of output per man-hour is lower in agriculture than it is outside farming, although the growth rate in productivity has been faster on the farm.

Making the Pie Bigger

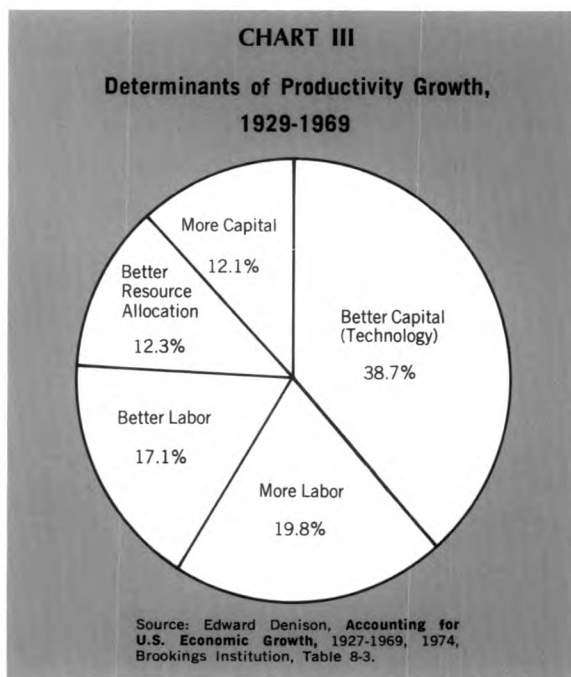
Is productivity growth the only thing which

increases the total amount of goods and services available in the economy? The answer is “no”; there are several other factors at work generating growth in total output and thus increasing the output pie. For example, variations in the length of the work-week and changes in the proportion of people of working age who are employed can alter total output without affecting output per man-hour. However, increases in productivity have been the largest factor contributing to growth in total output of goods and services. In fact, productivity growth is a prime determinant of the economy’s potential output.

What is “Potential” Output?

Potential output is the total of goods and services which could be produced if labor and other resources of the economy were “fully utilized.” By fully utilized, we mean the amount of capacity utilization that one could expect to accompany reasonable price stability. To judge future growth in potential output, the President’s Council of Economic Advisors made a calculation based on past growth in hours worked and in output per man-hour. The Council currently estimates potential output to be growing at 4 percent annually.³ This is derived from combining the estimated labor force growth rate of 1.8 percent per year with a 0.3-percent decline in average annual work hours and a 2.5-percent increase in output per man-hour ($1.8 - 0.3 + 2.5 = 4.0$). Productivity growth is extremely important, then, in increasing potential output and the income pie. Obviously, this is a rather crude calculation, and the results must be used with caution. However, estimating growth in potential output in this way gives a rough idea of how fast total output is growing and serves as a guide to policy. For example, we would expect that if combined government and private demands on the economy were growing at a rate above 4 percent for a sustained period, there would be upward pressures on prices. That is the kind of price increase economists call demand-pull inflation, because it results from society’s attempt to use more resources than are actually available.

³“The United States Economy in 1985,” *Monthly Labor Review*, Bureau of Labor Statistics, December 1973. Since 1962 when the original estimates were made, the rate of growth in output potential has changed, but the system of estimating it has not. From 1962 through 1965, output potential was estimated by the Council to be growing at a rate of 3.75 percent per year. From the fourth quarter of 1965 to the fourth quarter of 1969, it was estimated to be growing at a rate of 4 percent per year; and from 1969 through 1973, the estimate was a 4.3-percent annual rate of growth.



How are Labor Productivity and Pay Related?

Workers know what they get paid per hour or year, and their employers must value labor input in much the same manner. In a competitive economy, no one is hired unless the amount earned from the sale of his output exceeds the wage paid to him.⁴ The money obtained by selling the individual’s output ultimately determines his wage. Thus, there should be a direct link between output per man-hour and wages and salaries.

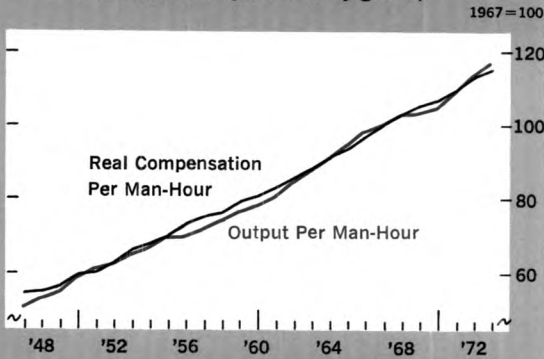
Why Does Real Income Grow?

Workers have shared in the benefits of the nation’s steadily increasing productivity. Chart IV shows that real income (that is, compensation adjusted for rising prices) has gone up almost steadily and that compensation closely parallels the growth of output per man-hour. This long history of nearly parallel growth in productivity and compensation is no accident. Productivity increases allow more goods to be produced, making possible gains in real income. This increase can occur directly through

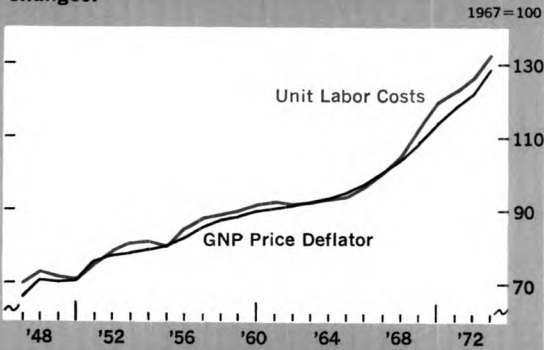
⁴The use of capital goods is also based on a time concept, and no capital good will be employed unless its expected rate of return exceeds its cost per unit of time. Of course, in marginal productivity theory, any factor input will be employed until the cost of employing it and the revenue derived from employing it are equal.

CHARTS IV & V

Real income grows as productivity grows,



... since price changes largely reflect labor cost changes.



Figures shown are annual averages for U.S. total private economy.

wage increases or indirectly through governmental programs.

Wage and salary increases larger than productivity gains have resulted in higher prices (see Chart V). Notice how closely prices, measured by the GNP price deflator, follow the trend of unit labor costs. This relationship is not surprising because unit labor costs are calculated by dividing average hourly compensation by output per man-hour. Unit labor costs increase whenever compensation rises faster than productivity. Labor costs are the largest portion of production costs. Therefore, when unit labor costs rise and all else remains unchanged, the price of whatever is produced also rises. This puts upward pressure on the general price level, and the inevitable result is cost-push inflation.⁵ For employees who have received pay increases, the impact of higher prices is cushioned by the rise in

pay; they may even gain in real income. However, for those who did not gain an increase, the rise in prices causes a decline in real income because their money buys fewer goods and services.

Real income of employees and society in general can increase even if their actual pay does not. There are periods when unit labor costs fall because productivity rises faster than compensation. When this happens, employers have the opportunity to charge lower prices for their products or to raise profits. Thus, in a perfectly competitive economy, productivity gains would be widely shared among many different segments of society. Productivity gains would lower costs, and competition would force goods to be sold at a price equaling the cost of production.

In reality, however, not all wages and prices are set in a competitive market. Many workers and employers have a degree of monopoly power in their markets, and the gains from productivity are not usually distributed by lowering prices. Instead, workers usually try to increase their wages to the full extent of productivity gains. If they get the better of the bargain, the result usually shows up in higher costs, which employers—if they have enough market power—can recover by raising prices. If workers get the worst of the bargain, productivity gains show up mostly in profits. However, all members of society could benefit if labor and management acted as they would in a perfectly competitive economy and used productivity gains to lower prices rather than raise wages or profits. If all employers and workers did this, prices would fall and, barring other changes, everyone would be able to buy more with the same amount of money. Then even persons on fixed pensions could obtain direct benefits from the education and research to which they had contributed during their working years. Distributing productivity gains in this manner seems more equitable than the current situation, where groups with the greatest economic and political strength make economic gains relative to the rest of the population.

Conclusion

Increased efficiency in the use of resources is the ultimate source of increased output per person and the major source of growth in the economy. The most important resource in our economy is labor, and increases in the quality of labor have been an important source of increased output per man-hour worked. But whatever the source of growth in the future, the only path to increased real income and higher living standards for everyone is clearly through increased productivity. A more productive economy allows society to divide a larger pie rather than have different sectors attempting to gain larger slices of the same pie and see the supposed gains vanish in inflation. ■

⁵There are other sources of cost-push inflation, but wages are the source of increases in costs most people think of first. In fact, cost-push inflation can be caused by an increase in the price of any factor used in production.

The Economic Slowdown Hits Tennessee

by John M. Godfrey

A previous analysis of Tennessee's economy by this Bank predicted that overall business activity had developed sufficient momentum to carry the state forward for further strong gains. After reviewing the record two years later, that expectation proved accurate. But now, since a slowdown has developed, Tennessee's underlying economic strength again comes under question. Basic to the forecast now are the answers to several questions. Just how strong were the past gains? Is the current weakness widespread or confined to a few sectors?

Unquestionably, Tennessee's economy, like the U. S. economy, slowed during 1974. Throughout 1971, 1972, and 1973, the state's economy showed substantial advances in incomes and jobs. But the growth in personal income, as measured in current dollars, slowed markedly during the first half of 1974. And when adjusted for price changes, real incomes are considerably lower than a year ago. The number of persons without jobs has risen. Factory pay envelopes are thinner as the workweek has shortened in many industries. A shrinking real income has made the consumer reduce his purchases of many large or postponable items.

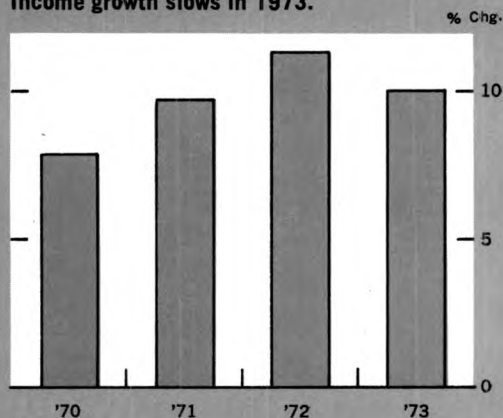
The initial cause of the current slowdown was a combination of special factors that had a major and immediate impact on business activity. The energy and materials shortages that accounted for much of the earlier slowdown should have had a positive impact as they were overcome. If, therefore, this were the only source of weakness in the state's economy, business activity should have quickly returned to its previous level. But the rebound has not appeared.

Taking a Closer Look

Examining the evidence in greater detail helps delineate the basic reasons for the slowdown. One point becomes increasingly obvious: Some slowing in the economic growth rate could reasonably be expected following the strong advances of the 1971-73 upswing. Overall expansion as rapid as this could not be sustained. As a result, by 1973 Tennessee's economy was operating with little unused capacity. Basically, then, some of the state's slower growth results from a short supply of plant capacity, raw materials, semi-finished goods, and skilled labor, rather than from a widespread lack of aggregate demand.

Therefore, some of 1973's slowdown was not a sign of weakness but rather a result of the previous surge. The change in personal income is an example. After advancing at an increasingly faster pace during 1971 and 1972, last year's personal income increased only at about 90 percent of the previous year's rate. However, wages and salaries from farming, mining, and durable goods manufacturing moved up quite strongly. At the same time, property income accruing to farm owners and to others for rent, interest, and corporate dividend payments rose at a strong pace. These gains have raised income levels in the state and should provide a base of support to counter some of the current weakness.

CHART I
Income growth slows in 1973.



This year the pattern of personal income is evidently changing. Income was weaker in some wage and salary areas during early 1974. However, farmers continue to benefit from generally higher crop prices.

However, there are many reasons to believe that overall personal income is once again on an upward path. Wages, in particular, are headed up. Early in the spring, the higher minimum wage went into effect. Since then much larger wage packages have been a major goal in labor negotiations. The end of wage-price controls freed many firms to grant postponed wage hikes and, in some cases, to pay "catch-up" raises. As more wages are adjusted automatically via cost-of-living clauses, interim pay increases will also take place. Finally, the end of the Arab oil embargo reversed the decline in several hard-hit industrial areas and eased shortages of petroleum-based raw materials. These factors are helping restore the purchasing power of earnings.

Employment Conditions Weaker

After showing steady improvement for three years, Tennessee's labor markets took a decided turn for the worse in early 1974. The major unemployment increase came during the first three months of this year, when energy-related layoffs totaled an estimated 7,000 persons. Most of the impact on manufacturing was concentrated in chemicals, plastics, and other petroleum-related industries. Also, many businesses dependent upon the tourist and travel trade had to retrench. Since then the number of workers laid off each month has declined, and the total number of unemployed has stabilized at around 65,000 persons. The unemployment rate, however, has continued to move up as new entrants into the labor force are unable to find work. And until enough new jobs open up, the unemployment rate will continue to rise even if new layoffs decline further.

Nonmanufacturing job gains now reflect the state's basic source of employment strength, with nearly all the weakness concentrated in manufacturing. Wholesale and retail trade employment continues to advance. While many service industries have added many new employees, those businesses closely associated with the travel trade are still not up to full strength. Construction employment is holding up reasonably well.

Recent announcements of cutbacks in manufacturing lines exemplify some of the problems facing Tennessee businessmen. One major appliance manufacturer is laying off employees because of faltering sales. Another producer of consumer goods has halted operations in the state in order to use the raw material, which is in short supply, for other industrial products. In some cases sales are very weak and in others sales are very strong, but in both cases operations are curtailed.

The Tri-Cities area posted an exceptionally strong advance in new employment. Largely responsible is a new plant that manufactures electrical-mechanical assemblies. New plant expansions by several existing firms have also helped enlarge employment opportunities. And closer analysis suggests that many of these new manufacturing jobs were filled by persons previously employed in trade, finance, insurance, real estate, and services.

Employment in Chattanooga, however, has been trending down since last year, with significant drops in services and fabricated metals products. It is not surprising that here and in Memphis, where new construction is weak, employment in the building trade is off. Overall job gains are strongest in Nashville, and the strength is centered in exactly the same sectors in which Chattanooga is weakest.

Throughout the state, as in many other parts of the Southeast, textile and apparel jobs have declined as consumers cut back on purchases of clothing and household furnishings. Although most of these textile-related job losses occurred outside major metropolitan areas, Knoxville and Nashville mills also cut back on employment to adjust output to sales.

The dip in average weekly earnings mirrors employment changes early in the year. A major factor was a shorter workweek, since many employees had been working several hours a week at time and a half. As a result, this small reduction in overtime had a considerably greater impact on take-home pay than suggested by the dip in hours alone. The decline in new housing caused part of the drop in hourly work at furniture plants; and the energy shortage dealt rubber and plastic goods manufacturers a blow, resulting in a production cutback. But countering the earlier fall in the work-week has been an over 10-percent rise in hourly

earnings during the last year. During the summer months, several important industries began operating longer hours.

Examining Local Activity

Since it is the rare ill wind that blows no good, the energy shortage also had a positive impact on some lines of business activity. In the Tri-Cities area, a contract has been let for a natural gas liquefaction plant and additional gas storage facilities, to help ensure ample fuel supplies. Similarly, a Nashville fabricator booked additional orders for towboats and oil-tank barges to transport fuel oil. And in the more distant future, a major oil company hopes to establish a \$250-million facility to recover and recycle spent nuclear fuel from the Oak Ridge atomic facilities.

Of current importance, Tennessee's coal production is advancing strongly. Through late summer, tonnage is up 30 percent over the same period last year. The price of coal has risen sharply in the last several years as electric-generating utilities have tried to secure adequate fuel supplies.

Even though additional mines are opening and coal output is on the upswing, problems still threaten. Mine operators face a labor strike if contract negotiations are not successful. As serious as the direct impact of a strike might be on output, jobs, and incomes in the mining areas, the most serious consequences will be felt outside the mine fields. Nearly all of the state's coal is used by electric-generating plants, and any reduction in electric power supplies will have substantial impact on the whole economy. Environmental considerations also remain a question mark. Tennessee's coal-mining future will depend on the increase in surface mines, which have come under heavy attack from environmental groups.

Another sector of the state's economy is benefiting from the increased demand for basic raw materials. Tennessee has long led the nation in zinc mining and solidified its position in 1969 after the discovery of a major zinc deposit. Now there is a proposal to construct a \$150-million zinc-processing plant in Clarksville, an operation with a potential of 500 jobs. More jobs will be created in transporting the ore to Clarksville and shipping the refined metal to users. Additional industrial development is also likely to follow, as supportive industries are established to use the acid by-product generated in the ore-refining process.

The gasoline shortage last winter had a major impact on tourism in the state. Motorists to and through Tennessee declined nearly 30 percent during the worst of the fuel crisis; airlines also reduced the number of their flights. Many people switched to other forms of surface transportation rather than face the uncertainties of automobile travel. Reduced and altered travel plans resulted in a cut-back in needed lodging, food, recreation, and transportation-related services.

With the return of additional and more certain gasoline supplies, the summer tourist trade reached a more normal volume. Such attractions as the Grand Ole Opry are reporting strong advance ticket sales after moving into the new Opryland facilities. But in other ways the tourist industry may be faced with fundamental changes in vacation travel and lodging plans. For example, many families travel in recreation vehicles, using both private and public campgrounds. This means that less money is spent for conventional lodging in motels and for food in restaurants.

The Consumer Changes Spending Plans

A number of factors have changed the pattern of consumer purchases. The rapid rise in retail prices has forced households to reallocate purchases, with less money for discretionary purchases. For example, household expenditures for food have risen nearly 13 percent because of higher prices. As a result, spending for durable goods and postponable items has shown large reductions. Auto sales plummeted late last year, but the decline stabilized during the winter; they were running at about 80 percent of last year's pace through midsummer. Purchases of household appliances appear to be running at about last year's pace, after adjustments for price increases.

Based upon selected department store sales, business seems to be strongest in Chattanooga and Knoxville. Consumer credit extensions by banks serve to further confirm this pattern of consumer spending. Instalment bank credit for automobile

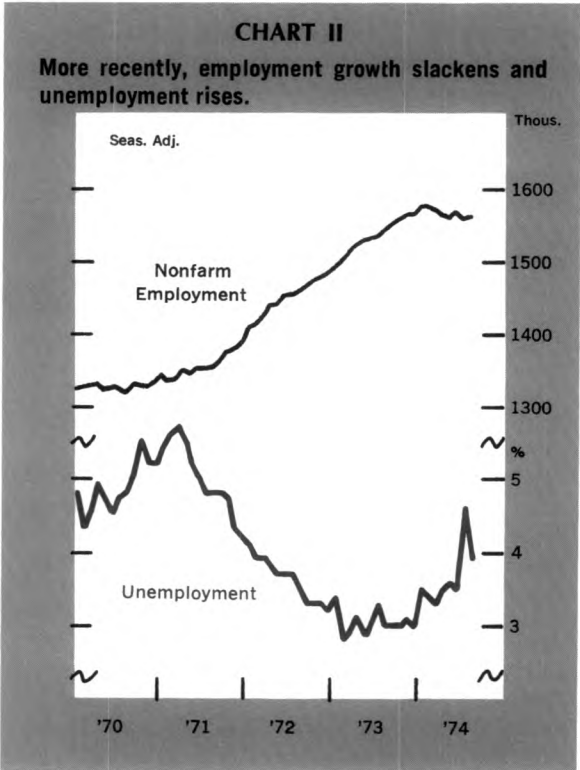
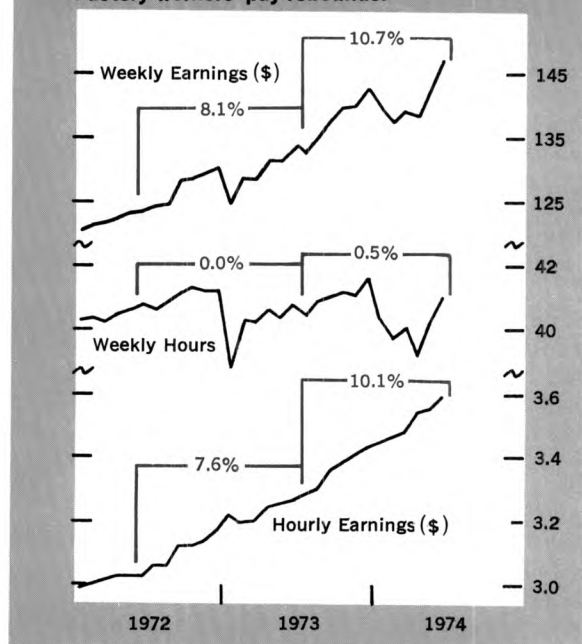


CHART III
Factory workers' pay rebounds.



and retail goods rose at a much slower pace during the latter half of 1973 and first half of 1974. Payments made on bank credit cards, however, picked up.

Farming: Good But Not Better

Tennessee farmers may be hard pressed to match 1973's record performance, when net income surged nearly 60 percent to \$460 million. Last year, the value of crop receipts rose to a record \$580 million, up 35 percent over 1972 and a whopping 52 percent over 1971. These gains were the result of higher farm receipts and greatly expanded output.

Receipts from soybeans, Tennessee's major crop, were up sharply in 1973. Demand for soybeans has increased during the last few years and Tennessee farmers have increased plantings; heavy spring rains in 1973 hampered the planting and growth of many other crops, diverting land to soybean production.

Even though bad weather reduced last year's cotton crop nearly one-fifth, sharply higher prices caused a more than 20-percent gain in receipts. Tobacco was also a casualty of poor growing conditions. The values of other major crops such as corn, hay, and small grains were generally higher. In contrast, winter wheat production was off as much as 40 percent in 1973.

Livestock receipts added a large plus to Tennessee's farm income in 1973, but higher prices accounted for nearly all of the gain. Income from cattle advanced over 20 percent and comprised nearly two-thirds of total livestock receipts. There was considerable inventory building of beef cattle.

Receipts from the sale of hogs totaled \$142 million last year, up nearly two-thirds from 1972. In contrast to beef cattle, the poundage of hogs that went to market rose nearly 10 percent as Tennessee farmers took advantage of record pork prices. Farmers increased output by feeding their hogs to attain heavier weights and by reducing inventories.

In response to expanded agricultural output, farm employment rose during 1973 for the first time in recent years. Both the use of family members and hired workers were up.

Although Tennessee's farm sector continues strong, on balance it is apparently not the source of large gains this year. State farmers planted about 8 percent more land this year, and crops will likely be the strongest part of the sector. Prices may continue to rise and bigger crops may result in considerably higher gross sales; but at the same time, higher prices on everything from tractors to fertilizer and fuel are probably cutting into net income.

According to estimates, 1974's cotton and tobacco acreage is up about 20 percent. Farmers have planted about 10 percent more corn and reduced soybean plantings slightly below last year's record level. The winter wheat harvest, more than double 1973's poor harvest, was the largest in years.

But, as was true last year, weather had an important influence on crop developments. Unusually wet spring weather delayed the planting of some crops and necessitated replanting others. Continued bad weather diverted some cotton land to soybean production. For those crops already in the ground, damp, cloudy weather during the early growing season hampered development directly and indirectly resulted in further losses because of plant disease and insects. And, as if the weather were not already enough of an uncertainty, farmers were confronted with unusually hot and dry weather during the late summer months.

Livestock receipts are also under pressure this year. Falling prices have thus far reduced receipts and, together with high feed and related costs, net farm income may be even lower when the books are closed.

Construction: A Base of Support

New construction is one sector that is providing a base of economic support. Total construction (in dollar terms) is running ahead of last year's strong pace, but some important shifts in the sector have occurred.

For the state as a whole, residential homebuilding has contracted some 23 percent, as measured in dollar volume during the first several months of this year. The drop in housing starts has been even more severe—some 6,000, or over one-fourth of the starts during the same period last year. Tennessee's housing decline, however, is less severe than in other southeastern states and in the country as a whole. The major part of the decline has occurred in the state's metropolitan areas—Chattanooga,

Knoxville, and Memphis. Nashville has bucked the state trend with a respectable gain in new dwelling units.

A substantial part of the drop in residential construction is explained by what has happened to the major sources of funds for home mortgages—the savings and loan associations and commercial banks. During the first half of 1973, when deposit inflows were strong, S&L's extended additional mortgage loan commitments and made new mortgage loans. By mid-1973, rising interest rates on competing financial instruments attracted consumer savings, and S&L's cut back on loan commitments. To offset deposit losses, many S&L's stepped up their borrowings from the Federal Home Loan Banks. As a result, the pace of new homebuilding began to fall.

Throughout early 1974, deposit flows stabilized and improved relative to the last half of 1973. With positive savings gains, the S&L's have been able to extend new loan commitments to prospective home owners. However, the savings flow and mortgage situation worsened as the year progressed.

Much the same pattern of deposit flows and mortgage loan adjustments occurred at the state's commercial banks. Consumer time and savings deposit growth tapered off in the last half of 1973, and banks cut back on the volume of new mortgage loans, especially for multifamily residences. During the first half of this year, member banks in the Sixth District portion of the state have increased their lending for multifamily housing and nonresidential property.

Nonresidential building, such as factories, offices, schools, and hospitals, is taking up some of the slack left by the weaker housing sector. In specific localities, this type of construction can have a major impact. For example, downtown Knoxville is now getting a "face lifting" much like that Nashville began several years ago. Initial plans outlined for one project call for new office and parking facilities. Later, more office and parking space will be added and a large hotel will be constructed. In the long run, improving the appearance of older buildings and constructing new office complexes can revitalize the downtown area of a city and increase retail and service trade.

The strength in new construction, however, is centered in many nonbuilding types of construction. Important new contracts have been let in recent months for major sewer and water projects in western Tennessee and for a dam and river work in the eastern part of the state. In all, construction activity in Tennessee is still fairly strong but decidedly changed.

Increased Pressure on Tennessee Banks

During most of 1974, Tennessee banks faced the same pressures as those in other states from strong credit demands and record interest rates. But Tennessee banks also had to contend with the restrictions imposed by the state's 10-percent usury

law. As a result, when market interest rates rose above the usury ceiling, Tennessee banks were prevented from charging a competitive interest rate on loans while paying the competitive interest rates on borrowed funds. These unfavorable conditions caused many of the larger banking organizations to report lower earnings.

Despite generally tight credit conditions, bankers continued to extend credit. At member banks in the District portion of the state, total loans advanced nearly 13 percent in the first six months of 1974 in contrast to less than an 8-percent gain in the latter half of 1973. Loans to business firms advanced at over a 15-percent rate during the first six months of the year. At some of the larger banks, the strongest demands came from construction and wholesale and retail trade firms and from textile and apparel manufacturers. Various types of service firms also borrowed more, while food, liquor, and tobacco firms paid down bank loans. Seasonal demands for farm credit also advanced at a strong pace, while loans to nonbank financial institutions picked up considerable strength after March. Since midyear, however, many banks caught in the interest rate squeeze have begun to scrutinize closely requests for credit and are turning down applications for nonessential and speculative loans.

At a time when banks were under pressure to make loans available to their customers, total deposits remained virtually unchanged. In the first six months of 1974, actual demand deposits fell over 10 percent after a nearly 20-percent gain in the previous six months. While time and savings deposit growth was stronger in 1974, much of the apparent strength merely reflects the aggressive purchase of money market CD's by some of the larger banks.

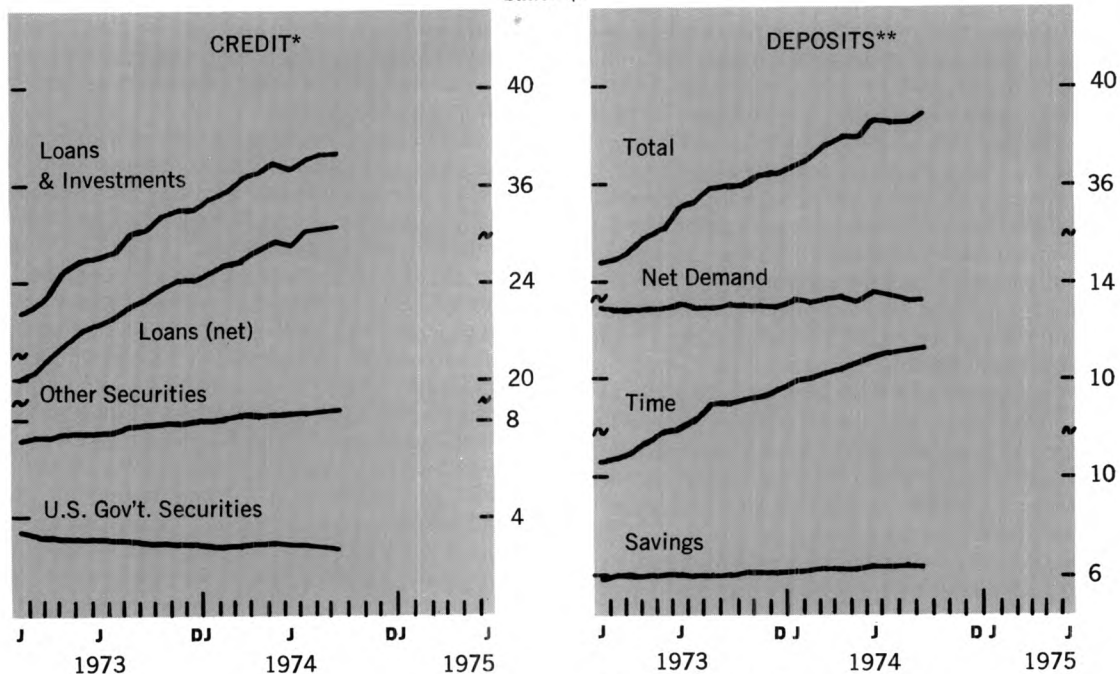
In order to meet the loan requests at a time when deposit inflows were weak, many of the large Tennessee banks sharply increased their purchase of Federal funds (the excess reserves of other banks). At the same time, they generally lightened their portfolios of securities. Sales of U. S. Government securities accelerated during the year, but purchases of tax-exempt municipal obligations picked up. Through these actions, Tennessee banks have generally tried to meet the state's necessary needs for credit, although these efforts have been at the expense of decidedly lower earnings.

The Future

In summary, this review of Tennessee's economy shows that a slowdown has occurred. While the slowdown was initially the result of the energy shortage, the economy did not rebound with the return of more normal petroleum supplies. The weaknesses noted so far have not spread throughout the whole range of business activity, and some areas can still be considered as strong. Economic activity is not apt to show significant strength until business conditions throughout the rest of the country pick up, since national conditions exert a major influence on the state. ■

BANKING STATISTICS

Billion \$



LATEST MONTH PLOTTED: SEPTEMBER

*Figures are for the last Wednesday of each month

**Daily average figures

SIXTH DISTRICT BANKING NOTES

Loans to Manufacturers

SEVEN SELECTED MANUFACTURING INDUSTRIES RANKED BY BANK LOAN AND INVENTORY CHANGES (JULY 1973 TO JULY 1974)

Industry	6th Dist. States With Heaviest Concentration	6th Dist. % of National Loan Totals ¹	Ranking by Percentage Changes			Ranking by \$ Changes		
			Loans From 6th Dist. Banks ¹	Loans From Banks Nationally ¹	National Inven- tories ²	Loans From 6th Dist. Banks ¹	Loans From Banks Nationally ¹	National Inven- tories ²
Prim. Metals	Ala.	2%	6 of 7	7 of 7	6 of 7	6 of 7	7 of 7	5 of 7
Machinery	Ala., Fla., Ga., La., Tenn.	2%	2	2	2	2	1	1
Trans. Equip.	Ga., Fla.	4%	3	1	5	3	2	2
Food, Liquor, Tobacco	Fla., Ga.	4%	4	6	7	4	5	6
Textiles, Apparel, Leather	Ga.	5%	1	5	4	1	3	4
Pet. Refining	La.	4%	5	3	1	5	6	7
Chemicals, Rubber	Tenn.	3%	7	4	3	7	4	3

¹ Based on reports from a Federal Reserve sample of large member banks around the nation, 23 of which are in the Sixth Federal Reserve District.

² Based on "Inventory Stock" data, U. S. Department of Commerce. Inventory-growth figures for the "Textiles, Apparel, and Leather" industry were extrapolated from quarterly data.

If we happened to focus on a particular bank loan to a particular business in an effort to determine how that loan came to be made, we would probably come up with a long list of reasons. Although some of the circumstances—like personal relationships—would be peculiar to the loan under consideration, many of the factors would be more general in the sense that they also influence other bankers and businessmen in the region and around the nation. Shifting from a particular loan to aggregated loan figures, the more general influences tend to reinforce each other, whereas the peculiar factors tend to cancel each other and diminish in effect. Some of these more general influences, moreover, should be characteristic of various industries. We would expect the circumstances inducing one primary metals corporation to borrow to resemble those influencing another primary metals firm, more so than those affecting a textile corporation.

This helps us take a stab at an intriguing question about Southeastern banking behavior: To what extent do the factors inducing various corporations to borrow from Southeastern banks resemble those inducing corporations in the same industries to borrow from banks across the country? The answer, apparently, is "Not very much." Borrowing patterns at Southeastern banks seem out of step with national patterns.

Following the same logic, we may go a step further and ask, "To what extent are the inventories carried by these corporations across the nation reflected as an influence on borrowing from Southeastern banks?" The answer here apparently is, "Even less." Inventory finance is a traditionally important business use of bank loans. Lacking information on the inventories either of Southeastern corporations or of those which borrow from Southeastern banks, we arrive at this answer by directly comparing national inventories with Southeastern bank loans. (National inventories do seem to correspond fairly closely to national loan activity, however.)

These results emerge from our comparison of loans made by 23 large Southeastern member banks to corporations in seven selected industries,¹ on the one hand, with information on national loan and inventory activity in these industries, on the other. The resulting interindustry ranks, reflecting both percentage changes and dollar changes between mid-1973 and mid-1974, are tabulated on the opposite page. We have summarized the rankings of the seven industries for comparison by calculating so-called rank correlation coefficients, which are shown in the second table: A coefficient close to zero implies very little correspondence between the

RANK CORRELATION COEFFICIENTS

	Ranks in Terms of % Changes	Ranks in Terms of \$ Changes
Sixth District loans versus national loans	.32	.68
Sixth District loans versus national inventories	.04	.36
National loans versus national inventories	.57	.86

two characteristics whose ranks are being compared; a coefficient close to one implies a close correspondence. (For example, the coefficient of .04 suggests there is very little relationship between the percentage-change rankings of borrowing from Southeastern banks and national inventories; the coefficient of .86, on the other hand, suggests a strong relationship between the dollar-change rankings of national borrowing from banks and national inventories.)

Several other interesting implications have emerged from the same analysis. First, Southeastern banks account for a disproportionately small share of national bank lending to each of these manufacturing industries. Although the Sixth District area accounts for between 8 and 10 percent of the nation's population, personal income and manufacturing output, District banks account for only 2 to 5 percent of the loans made to these industries.²

Secondly, in terms of percentage growth, loans by Sixth District banks to these industries expanded less than did national loans to the same industries,³ even though the growth of manufacturing production and employment in the Southeast exceeded that of the nation from mid-1973 to mid-1974. The implication of these two results reinforces the often-stated dictum that the Southeast is and has been an importer of funds in the form of bank loans, in that banks outside the region have apparently been supplying part of its industries' needs for bank funds.

²The particular data used here account for a small part of the low proportion, but not all of it. The large member banks used here, all member banks, and all commercial banks in the Sixth District, respectively, account for 5, 6 and 7 percent of the corresponding national loan totals.

³The single exception was the textiles, apparel, and leather industry.

WILLIAM N. COX, III

Sixth District Statistics

Seasonally Adjusted

(All data are indexes, unless indicated otherwise.)

		Latest Month 1974	One Month Ago	Two Months Ago	One Year Ago			Latest Month 1974	One Month Ago	Two Months Ago	One Year Ago
SIXTH DISTRICT						Unemployment Rate ² (Percent of Work Force) Aug. 4.3 4.2 4.1 3.9					
INCOME AND SPENDING						Avg. Weekly Hrs. in Mfg. (Hrs.) Aug. 40.6 40.4 41.1 40.6					
Manufacturing Payrolls	Aug.	180	178	180	165	FINANCE AND BANKING					
Farm Cash Receipts	July	196	174	215	217	Member Bank Loans	Aug.	254	249	253	224
Crops	July	260	232	289	267	Member Bank Deposits	Aug.	206	208	205	190
Livestock	July	178	159	200	198	Bank Debits**	Aug.	267	273r	254	211
Installment Credit at Banks* ¹ (Mil. \$)						FLORIDA					
New Loans	Aug.	656	676r	724	677	INCOME					
Repayments	Aug.	546	667r	668	568	Manufacturing Payrolls	Aug.	190	192	192	172
EMPLOYMENT AND PRODUCTION						Farm Cash Receipts	July	197	202	245	279
Nonfarm Employment	Aug.	132.5	132.4	132.4	131.3	EMPLOYMENT					
Manufacturing	Aug.	117.5	117.4	118.3	118.9	Nonfarm Employment	Aug.	154.8	155.3	153.7	152.4
Nondurable Goods	Aug.	114.8	114.7	115.8	115.4	Manufacturing	Aug.	129.4	129.3	129.5	129.2
Food	Aug.	103.7	104.0	104.3	101.6	Nonmanufacturing	Aug.	159.7	160.3	158.4	156.9
Textiles	Aug.	110.5	111.2	112.9	112.3	Construction	Aug.	193.0	198.6	201.8	209.9
Apparel	Aug.	112.3	112.0	113.8	117.3	Farm Employment	Aug.	102.5	109.0	98.8	106.1
Paper	Aug.	112.9	113.6	113.5	112.9	Unemployment Rate ² (Percent of Work Force)	Aug.	5.2	4.8	5.1	3.9
Printing and Publishing	Aug.	128.4	128.7	129.4	129.4	Avg. Weekly Hrs. in Mfg. (Hrs.)	Aug.	39.9	40.4	40.4	40.6
Chemicals	Aug.	111.7	111.4	110.9	107.5	FINANCE AND BANKING					
Durable Goods	Aug.	120.8	120.3	121.4	123.3	Member Bank Loans	Aug.	316	313	315	273
Lbr., Wood Prods., Furn. & Fix.	Aug.	107.7	110.7	110.0	113.7	Member Bank Deposits	Aug.	248	248	247	230
Stone, Clay, and Glass	Aug.	127.5	128.8	128.5	130.1	Bank Debits**	Aug.	336	311	312	306
Primary Metals	Aug.	113.8	113.3	113.5	113.2	GEORGIA					
Fabricated Metals	Aug.	130.5	132.0	130.4	130.1	INCOME					
Machinery	Aug.	155.1	156.6	157.7	155.3	Manufacturing Payrolls	Aug.	169	164	170	156
Transportation Equipment	Aug.	111.1	105.7	111.3	116.8	Farm Cash Receipts	July	195	153	222	176
Nonmanufacturing	Aug.	137.8	137.8	137.4	135.6	EMPLOYMENT					
Construction	Aug.	139.9	142.1	143.2	148.4	Nonfarm Employment	Aug.	128.8	127.6	128.9	128.1
Transportation	Aug.	124.7	125.9	126.1	124.6	Manufacturing	Aug.	110.7	109.0	111.6	113.2
Trade	Aug.	138.6	138.2	138.2	136.4	Nonmanufacturing	Aug.	136.2	136.3	136.7	135.0
Fin., ins., and real est.	Aug.	147.5	147.3	147.4	145.3	Construction	Aug.	133.4	138.5	138.7	143.6
Services	Aug.	148.3	150.4	150.4	145.8	Farm Employment	Aug.	84.3	89.7	83.4	87.1
Federal Government	Aug.	104.5	103.6	102.9	99.6	Unemployment Rate ² (Percent of Work Force)	Aug.	4.8	4.6	4.5	3.7
State and Local Government	Aug.	139.1	138.7	137.2	135.2	Avg. Weekly Hrs. in Mfg. (Hrs.)	Aug.	39.7	39.6	40.1	40.3
Farm Employment	Aug.	81.4	87.4	81.5	83.8	FINANCE AND BANKING					
Unemployment Rate ² (Percent of Work Force)	Aug.	4.9	4.9	4.7	4.0	Member Bank Loans	Aug.	270	270	269	241
Insured Unemployment (Percent of Cov. Emp.)	Aug.	2.3	2.3	2.3	1.8	Member Bank Deposits	Aug.	188	195	196	183
Avg. Weekly Hrs. in Mfg. (Hrs.)	Aug.	39.9	40.2	40.4	40.6	Bank Debits**	Aug.	344	330	328	278
Construction Contracts*	Aug.	198	208	202	271	LOUISIANA					
Residential	Aug.	159	181	214	293	INCOME					
All other	Aug.	237	236	190	250	Manufacturing Payrolls	Aug.	159	158	157	154
Cotton Consumption**	June	81	79	79	84	Farm Cash Receipts	July	236	154	162	211
Petroleum Production**	Aug.	99	99	101	114	EMPLOYMENT					
Manufacturing Production	Feb.	299.4	297.0	300.0	288.5	Nonfarm Employment	Aug.	115.4	115.8	115.6	115.1
Nondurable Goods	Feb.	241.9	243.4	247.7	238.8	Manufacturing	Aug.	101.2	103.3	103.8	105.4
Food	Feb.	189.9	190.0	191.5	185.5	Nonmanufacturing	Aug.	118.4	118.4	118.1	117.1
Textiles	Feb.	298.4	304.5	301.7	281.8	Construction	Aug.	87.7	87.3	84.9	84.6
Apparel	Feb.	294.1	293.0	291.9	286.8	Farm Employment	Aug.	61.3	71.3	66.4	75.9
Paper	Feb.	202.6	204.5	226.9	222.1	Unemployment Rate ² (Percent of Work Force)	Aug.	6.6	6.8	6.7	6.4
Printing and Publishing	Feb.	156.4	156.0	155.9	161.7	Avg. Weekly Hrs. in Mfg. (Hrs.)	Aug.	40.0	40.4	40.2	41.7
Chemicals	Feb.	311.7	323.5	320.9	305.9	FINANCE AND BANKING					
Durable Goods	Feb.	368.1	361.3	362.5	347.6	Member Bank Loans*	Aug.	252	248	246	224
Lumber and Wood	Feb.	207.2	205.9	206.3	199.6	Member Bank Deposits*	Aug.	189	191	189	171
Furniture and Fixtures	Feb.	177.4	186.4	188.7	190.6	Bank Debits**	Aug.	248	244	235	191
Stone, Clay, and Glass	Feb.	231.1	229.9	216.5	207.0	MISSISSIPPI					
Primary Metals	Feb.	273.6	273.9	272.2	231.0	INCOME					
Fabricated Metals	Feb.	310.6	310.6	308.0	283.3	Manufacturing Payrolls	Aug.	202	201	203	182
Nonelectrical Machinery	Feb.	472.7	468.8	478.9	435.9	Farm Cash Receipts	July	214	186	192	238
Electrical Machinery	Feb.	865.8	855.9	835.0	778.1	EMPLOYMENT					
Transportation Equipment	Feb.	419.9	392.1	416.0	453.2	Nonfarm Employment	Aug.	129.3	129.1	129.4	127.3
FINANCE AND BANKING						Manufacturing	Aug.	129.2	130.2	130.7	130.0
Loans*						Nonmanufacturing	Aug.	129.3	128.6	128.9	126.1
All Member Banks	Aug.	279	276	276	244	Construction	Aug.	124.3	124.6	127.5	133.0
Large Banks	Aug.	263	259	259	229	Farm Employment	Aug.	75.9	79.9	74.0	71.1
Deposits*						ALABAMA					
All Member Banks	Aug.	214	216	215	198	INCOME					
Large Banks	Aug.	187	184	187	174	Manufacturing Payrolls	Aug.	182	179	181	165
Bank Debits**	Aug.	306	293r	288	252	Farm Cash Receipts	July	225	207	255	266
ALABAMA						EMPLOYMENT					
INCOME						Nonfarm Employment	Aug.	120.9	121.0	120.9	120.2
Manufacturing Payrolls	Aug.	182	179	181	165	Manufacturing	Aug.	117.6	117.5	117.3	117.0
Farm Cash Receipts	July	225	207	255	266	Nonmanufacturing	Aug.	122.4	122.0	122.5	121.7
EMPLOYMENT						Construction	Aug.	120.9	120.3	124.9	131.2
Nonfarm Employment	Aug.	120.9	121.0	120.9	120.2	Farm Employment	Aug.	68.9	75.6	81.8	69.9
Manufacturing	Aug.	117.6	117.5	117.3	117.0	MISSISSIPPI					
Nonmanufacturing	Aug.	122.4	122.0	122.5	121.7	INCOME					
Construction	Aug.	120.9	120.3	124.9	131.2	Manufacturing Payrolls	Aug.	202	201	203	182
Farm Employment	Aug.	68.9	75.6	81.8	69.9	Farm Cash Receipts	July	214	186	192	238

	Latest Month 1974	One Month Ago	Two Months Ago	One Year Ago
Unemployment Rate ² (Percent of Work Force) Aug.	4.2	4.1	3.9	3.7
Avg. Weekly Hrs. in Mfg. (Hrs.) Aug.	39.6	39.7	39.9	40.6
FINANCE AND BANKING				
Member Bank Loans* Aug.	264	258	265	236
Member Bank Deposits* Aug.	218	217	219	196
Bank Debits** Aug.	262	259	256	200

TENNESSEE

INCOME

Manufacturing Payrolls Aug.	184	181	181	170
Farm Cash Receipts July	182	204	277	197

EMPLOYMENT

Nonfarm Employment Aug.	128.5	128.2	128.8	127.0
Manufacturing Aug.	118.2	117.9	119.2	120.5
Nonmanufacturing Aug.	134.3	134.0	134.2	130.8
Construction Aug.	135.3	135.7	132.6	135.0
Farm Employment Aug.	95.7	93.8	87.2	96.3
Unemployment Rate ² (Percent of Work Force) Aug.	3.9	4.6	3.5	3.0
Avg. Weekly Hrs. in Mfg. (Hrs.) Aug.	39.9	40.7	40.3	40.5

FINANCE AND BANKING

Member Bank Loans* Aug.	272	268	265	226
Member Bank Deposits* Aug.	203	204	201	182
Bank Debits** Aug.	290	270	264	205

*For Sixth District area only; other totals for entire six states

**Daily average basis

†Preliminary data

r-Revised

N.A. Not available

Note: Indexes for bank debits, construction contracts, cotton consumption, employment, farm cash receipts, loans, petroleum production, and payrolls: 1967 = 100. All other indexes: 1957-59 = 100.

Sources: Manufacturing production estimated by this Bank; nonfarm, mfg. and nonmfg. emp., mfg. payrolls and hours, and unemp., U.S. Dept. of Labor and cooperating state agencies; cotton consumption, U.S. Bureau of Census; construction contracts, F. W. Dodge Div., McGraw-Hill Information Systems Co.; petrol. prod., U.S. Bureau of Mines; farm cash receipts and farm emp., U.S.D.A. Other indexes based on data collected by this Bank. All indexes calculated by this Bank.

¹Data benchmarked to June 1971 Report of Condition.

²Unemployment rates for all District States except Florida have been estimated using new techniques developed by the U. S. Dept. of Labor. New seasonal factors have been developed for all six District States. These new seas. adj. rates are not comparable with previously published unemp. rates.

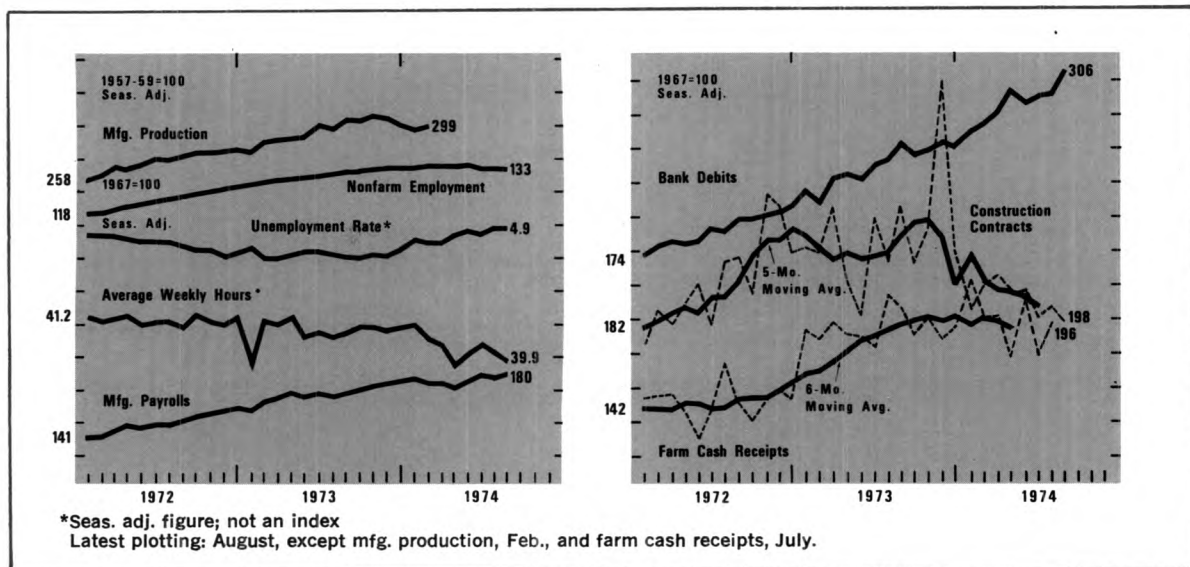
Debits to Demand Deposit Accounts

Insured Commercial Banks in the Sixth District

(In Thousands of Dollars)

							Percent Change										Percent Change		
																	</		

District Business Conditions



The District economy shows little or no signs of change from prevailing sluggishness. Labor markets were stable in August. Consumer spending remains lethargic. A further slump in the housing sector brought total construction activity down. Farm income prospects deteriorated, as a sharp fall in livestock prices more than offset the improved outlook for crops. Bank lending expanded moderately, but growth in consumer time deposits has been feeble.

Labor market conditions were about unchanged in August. The unemployment rate remained steady at 4.9 percent but well above the year-ago 4.0-percent rate. Nonfarm employment showed little change; indeed job growth has been flat throughout this year. Construction jobs continued to weaken, however. Job losses were recorded in a number of manufacturing industries but were offset by a sharp rebound in transportation equipment jobs. Factory hours fell off.

Spending and borrowing indicators reflected the squeeze on consumers. Consumer repayments of instalment debt slowed in August, while new lending expanded at a nearly normal pace. As a result, consumer instalment debt outstanding rose sharply. A surge in lending for nonautomotive consumer goods more than offset a weak-auto sector. General retail sales, adjusted for inflation, and unit auto sales both improved but were below the same month last year.

The pace of bank lending has moderated, except for a spurt over the mid-September tax date. Demand deposits advanced through late September, reversing a two-month decline. Growth in consumer time deposits, however, remains weak. To acquire funds for lending, banks have increased security

sales. As of the end of September, most of the larger banks were maintaining a 12-percent prime rate. During late summer, the average rate paid on business loans was 11.6 percent, up from 10.6 in late spring.

The value of residential construction contracts dropped sharply in August for the fourth month of decline and stood almost 50 percent below the year-ago level. Since the August value of nonresidential contracts held at the July level, total value of construction contracts was off for the month. Thrift institutions suffered a second straight month of net deposit outflow during August, and permanent mortgage rates continued to climb.

As fall began, the agricultural income picture was a composite of extremes. Most Southeastern crop farmers expected good harvests and sharply higher prices compared with 1973 levels. Prospects were exceptionally bright for tobacco and peanut producers. Conversely, income prospects in the livestock sector were exceptionally dismal because of rapidly rising feed costs and low prices, particularly for calves. On balance, income prospects in agriculture have declined from earlier indications because of the severe deterioration in the livestock sector.

Note: Data on which statements are based have been adjusted whenever possible to eliminate seasonal influences.