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Econometric Models: What They Are and What They Say for 1971

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During the past ten years, economic forecasting, and with it the use of models of the economy, has gained considerable popularity but not the attention it deserves. For those unfamiliar with the concept of econometric model building, this article explains how models are constructed and how they are used. Other readers may be interested in the different approaches each of the five selected models take, especially in the details presented in the Appendix. Most readers will be interested in what the models say about 1971's economic outlook.

What Is Econometrics?

Theory, the Starting Point of Prediction. In order to understand econometrics and *econometric models*,¹ it is necessary to look briefly at economic theory, especially with regard to predictability. Econometrics might best be described as a blend of economic theory, statistics, and mathematics designed to test theoretical relationships concerning the economy. The statistical and mathematical techniques used in econometrics will generally test to what degree a given theory holds true or to what extent it can be rejected.

Economic theory, since it is concerned with the actions of an economy, is concerned with the actions of people, often, millions of them. The task of theory, then, is to determine whether the actions of these people follow a consistent or predictable pattern. The key element, here, is predictability. While people may not always act rationally (as evidenced by sales of products that are known to be harmful to one's health), they will generally act predictably.

Let us look at a problem that might face an econometrician in predicting economic behavior. The econometrician wants to forecast automobile sales for next year. To do this he must establish a predictable relationship, based

¹See *Glossary* for italicized words.

on theory, drawn from the past, and applied to the future. This application of past predictable relationships to the future is the essence of econometric forecasting.

His economic theory tells him that the amount people as a group spend on automobiles depends upon their income. He is reasonably confident that personal income is going to rise by a certain amount next year. Thus, he would expect, on the basis of theory, that automobile sales would also be greater. But is this theory correct and, if it is, how much should he expect sales to rise?

To answer these questions, the econometrician might go back to the experience of the last 20 years. Using data on income and sales, he might determine by statistical testing that during the last 20 years, individuals as a group spent 11 percent of their income for automobiles. The theory that automobile sales are related to income seems to be correct, and he has a predictable, numerical figure expressing that relationship.

But his statistical testing also showed him that in not every one of the 20 years did the individuals as a group spend 11 percent of their income for automobiles. Some years they spent much more; and in others, much less. Apparently, something else besides income influenced sales.

To try to find what that something else is, the econometrician once more seeks the help of economic theory. According to economic theory, he might find that individuals also consider interest rates and automobile prices along with income when they buy automobiles. Once more he puts data for past years through statistical tests and finds that automobile purchases do tend to decrease as interest rates increase and to decrease as automobile prices increase. The statistical tests support the theory and give him additional predictable relationships. As a result, he knows that his success in forecasting automobile sales is going to depend on knowing not only what happens to income but also on what interest rates and prices are going to be.

At this point the econometrician has reached his first goal in the forecasting process. He has established what can be called a *functional relationship* between several sets of economic facts (often called *economic variables*). A functional relationship is commonly expressed in the form of an equation, as in the example below.

In our example, the equation for auto sales might take the following linear form:

$$S = aI + bP + cR$$

Where S = Value of auto sales, billions of 1958 dollars.

By a functional relationship, we mean that interest rates, prices, and personal income determine the amount of automobile purchases. Moreover, the relationship or equation can be quantified as seen in the next example.

In quantifying the example, values are assigned to a, b, and c based upon statistical observation of auto sales data in relation to personal income, auto prices, and interest rate data. The hypothetical equation might then appear as follows:

$$S = .11I - .0015P - .05R$$

Where a = .11; b = .0015; and c = -.05

This would mean that an increase in personal income would be translated into increased sales of automobiles in the amount of .11 times the change in the level of personal income. However, since the signs are negative, increases in the second and third terms tend to reduce the volume of auto sales. Thus, the econometrician can now predict the value of future auto sales, if he knows the future levels of personal income, interest rates, and automobile prices.

Problems of Prediction. The econometrician must be sure that he has tested and developed a cause and effect (functional) relationship. That is, *correlation* between two or more sets of data may have no cause and effect relationship. As one writer puts it "... take the figures that show the suicide rate to be at its maximum in June. Do suicides produce June brides—or do June weddings precipitate suicides of the jilted?"² Neither is very likely. This line of thinking is known as spurious correlation. (It is simply the

²Darrel Huff, *How to Lie with Statistics*, W. W. Norton and Co., New York, 1954.

I = The level of personal income.
P = The price index for automobiles.
R = The average interest rate charged on auto loans.

a,b,c, = The amounts that personal income, auto prices, and auto loan interest rates, respectively, affect auto sales. The values a, b, and c are called coefficients and are given numerical values.

assumption that a statistical relationship exists between two sets of data even when there is no logical reason for the relationship. Obviously, if there is no logical reason for the correlation of data, the relationship may be unreliable for predictive purposes. Thus, the econometrician should base his relationships not only on statistical measures but also on economic theory.)

Exogenous forces pose a second problem. In a nation or region, many unusual events occur that are uncertain as to time of occurrence and as to the magnitude of their effects. Such factors complicate the econometrician's forecasting problem. Some examples are war, earthquakes, or a sudden, unexpected change in consumer preferences or attitudes. The econometrician must, therefore, be careful to examine his predictive assumptions and make the best possible judgment concerning the course of future exogenous forces. Some of these forces, such as Government spending, are roughly predictable. Other exogenous forces, such as earthquakes, are largely out of the realm of human foresight, let alone that of the econometrician.

In developing his predictive relationships, the econometrician is also confronted with the problems of completeness and interaction. In reference to the example concerning auto sales, the econometrician must be sure that what he includes makes the relationship as complete as feasible. He had previously found that auto sales were related to the levels of income, interest rates, and automobile prices. However, after further examining these estimated relationships, suppose he finds a significant portion of auto sales are unexplained by the three variables. Upon investigation, he finds that the level of rapid transit fares can also influence the amount of auto sales in a given geographic area. Including this new economic variable, he finds he can account for most of the unexplained portion of his predictive relationship. If there are no other variables that significantly affect auto sales, he has solved his problem of completeness.

Having solved the problem of completeness, the econometrician is now faced with obtaining future data on personal income, prices, interest rates, and transit fares. How is he to obtain these data? This confronts him with the interaction problem. Interest rates and auto prices may not as readily lend themselves to explanation by a functional (cause and effect) relationship. In other words, because of the difficulties in predicting movements in auto prices and interest rates, it is very hard to establish the necessary equation(s) for each variable. Hence, a judgmental assumption must be made about future values of these variables.

However, assume he can establish functional relationships or equations to forecast transit fares

and personal income. He might note that rapid transit fares are tied to the wage levels of transit workers. But, by definition, wages are one portion of personal income. Further, personal income is partially determined by automobile sales, which, basically, he was trying to forecast in the first place.

Because of this, the econometrician needs additional functional relationships to forecast transit fares, transit wages, and also personal income. Some of these relationships are interrelated—thus, the interaction problem. Auto sales, which he was originally trying to forecast, affect personal income; but as we said, personal income levels affect wage rates in mass transit, and, consequently, transit fares. Transit fares, as mentioned above, partially affect auto sales.

At this point, the econometrician exclaims, "Hold it! I need an econometric model!"

Econometric Models and Prediction. It can easily be seen, then, that prediction can be a greater problem than it seems. The econometrician initially set up one functional relationship to forecast auto sales. This relationship or equation, which is, in fact, a single-equation econometric model, shows how certain "*independent*" variables—personal income, auto prices, interest rates, and transit fares—affect auto sales—the "*dependent*" variable. In the process, he found it necessary to predict certain independent variables; thus, other equations were necessary. For example, he found future transit fares must be predicted. Therefore, he needed an additional equation that stated that transit fares were partially determined by the level of transit workers' wages. This whole system of equations, when completed, is called a "theoretical economic model." When statistically tested and given numerical values, the theoretical model becomes the "econometric model." This econometric model can usually, then, be solved for the variable that the econometrician is trying to forecast; in the present case, the variable is auto sales.

Though the econometrician attempts to explain a number of variables in the model—e.g., auto sales, personal income, and transit fares—he must still consider some variables as outside the realm of the model's explanatory power—e.g., auto prices and interest rates. Those variables explained inside the model are termed "*endogenous variables*;" those determined outside the model are referred to as "*exogenous variables*." What determines whether a variable is exogenous or endogenous? Once again, we must come back to our notion of predictability. If a variable is readily predictable, it most likely will be endogenous. Other variables must be determined outside the model. For example, a variable such as Government spending in most models will be exogenous because its exact amount is subject

to many uncertain forces such as the decisions of Congress.

The econometrician is able to forecast auto sales after he has made assumptions about the future values of the exogenous variables—in our example, auto prices and interest rates. However, the econometrician must be aware that his forecast is based on an econometric model that is only an approximation of economic reality. There are two basic reasons for this: First, the model may yield an answer based upon relationships that, while on the average are accurate, may not always hold true for any individual prediction period. Second, in predicting the exogenous variables, an error in judgment might be made. For example, the future level of interest rates may be underestimated. Interest rates could turn out to be significantly higher than expected and, thus, cause our model to overstate the level of future auto sales.

Prediction and the Identification Problem. Constructing statistical tests and properly restricting the theoretical relationships to quantify the econometric model can often stump the econometrician. These tasks are necessary if a numerical forecast of auto sales (or any other variable) is to be made. Assuming the econometrician has data for all the variables he wishes to consider, he is still faced with solving the *identification problem*. From a mass of data on auto consumption and personal income, along with data on auto prices and interest rates, he must screen out the correct numerical value reflecting the effect of personal income on auto consumption. For example, if auto sales had increased by 20 percent during the last five years and at the same time both personal income and transit rates had increased, how much of the increase in sales is to be attributed to each of these variables? As one can readily see, the task of identifying the quantitative relationships of the econometric model would, in most cases, not be easy.

Practical Uses of Econometric Models

Who Uses the Models and Why? Despite many difficulties involved in the construction of econometric models, their use has spread rapidly in the last decade. Today, they will be found in many facets of industry, government, and education, in both practical and theoretical applications.

The previous section described the models as being built around a theory of economic prediction. Thus, a firm might use models to predict the number of color TV sales next year. Government economists may wish to predict the un-

employment rate next year. A college professor could use models to teach economic theory and how it may be used to predict economic activity in the real world.

In addition to forecasting, another important use of econometric models is *simulation*. While forecasting asks the question "what will?" simulation asks "what if?" For example, the government economist tries to estimate the 1971 unemployment rate based on his best assumptions of exogenous economic variables, such as Government spending or interest rates. He asks, "What will the unemployment rate be if Government spending and interest rates are such and such, which I think they will be?"

In contrast, a simulation technique would vary the assumptions about Government spending and interest rates. The economist would then ask, "What if Government spending were 10 percent higher? Would unemployment fall, and by how much?" He can, therefore, vary his assumptions on interest rates and Government spending, arriving at as many projected unemployment rates as the number of times he varied his assumptions. He may then present a list of alternatives to Government policy makers who will influence the levels of Government spending and interest rates. In fact, the use of econometric models to simulate the economic outcome of policy decisions has become an important tool of the Government policy maker.

Models Examined in This Article. The five econometric models examined in this article present a mixture of the various types of models in current use. The list of models and their uses described here is by no means exhaustive. The models chosen are some of the better known models, organized and operated by a mix of private, governmental, and educational organizations; all had shown accuracy in several earlier forecasts for 1970. Furthermore, the models' theoretical approaches include some diversity.

Consider also the diversity of organizations and the purposes for which the five models are used. The Wharton and Michigan models were developed by economists at educational institutions. The Data Resources model was developed by economists essentially working within the framework of a private corporation. All three of these models emphasize changes in real factors—such as consumption, investment, and Government spending—as the prime movers of economic activity.³ These large models provide detailed

³Real factors as the prime movers of the economy would be more often stressed by economists who would generally describe themselves as Keynesians or neo-Keynesians. Those economists who would

economic information to subscribers who would include in their ranks educational institutions, banks, manufacturing corporations, retailers, and government agencies. The St. Louis model was developed at the Federal Reserve Bank of St. Louis and places heavy emphasis on monetary factors as the prime mover of economic activity. The St. Louis staff economists make economic forecasts and simulations using the model, but their forecasts are not official forecasts of the Federal Reserve System. The RCA model, which also utilizes a Monetarist theoretical approach, was developed by RCA and is generally utilized by the firm in forecasting demand for its products. In addition to these models, there are many others in use that provide similar economic information to aid the businessman, educator, or Government policy maker in the decision making process.

At this point, it might be helpful to the understanding of econometric models to examine a particular problem of economic uncertainty—namely, the prediction of the unemployment rate—and to look at how each of the selected models handles this problem. For a more detailed description of the models and how they approach monetary policy, fiscal policy, and price movement problems, the interested reader may turn to the Appendix.

Predicting Unemployment. A reading of the press recently would leave little doubt in the minds of most observers that there is a great deal of uncertainty about the forecasts of the unemployment rate for 1971. Let us look at the approaches to this problem by the models discussed in this article.

The "Gap" Models: Data Resources, St. Louis, RCA.

These three models predict the unemployment rate basically by relating the unemployment rate to the difference between actual output or Gross National Product (GNP) and *potential output*. This failure of the economy to perform at its potential level is called a "gap." The greater the gap, the higher the unemployment rate.

This relationship (equation) requires a prediction of both actual and potential GNP in order to

place changes in the supply of money as the prime mover of economic activity would fall into the "Monetarist" school of thought. For a discussion of the major points of view of both the Keynesian and Monetarist schools, see William N. Cox, III, "The Money Supply Controversy," Monthly Review, Federal Reserve Bank of Atlanta, June 1969.

make a forecast of the unemployment rate. The actual GNP forecast will be determined within each of the three models. Potential GNP is exogenous in each model. Thus, care must be taken in developing the best possible forecast of potential GNP.⁴ Factors commonly considered in estimating a nation's potential output are the growth of the labor force, the accumulation of capital equipment, and technological progress.

The Michigan Model's Growth Rate Equation

The unemployment rate is projected in the Michigan Model by first predicting the employment rate. Employment is specified to be related to the rate of growth of real output (GNP) in the current and previous period, output per man-hour, and growth in the labor force. Basically, the model requires that GNP adjusted for price changes grow at a 3.9-percent rate per year. If the growth rate is less than this, unemployment will increase.

The unemployment rate for adult males (over 20 years old) is first computed. Then, this is expanded to a total unemployment rate on the basis of the adult male unemployment rate's relationship to the total unemployment rate.

Wharton's Labor Market Section

The determination of the unemployment rate in this model starts with the determination of employment in the labor market sector. Here, supply and demand forces are estimated to determine the various levels of farm, manufacturing, and nonmanufacturing employment. An unemployment rate is then computed.

This model also contains a *labor force participation rate* equation, which shows people dropping out of the labor force as the unemployment rate rises. This would tend to dampen increases in the unemployment rate.⁵

Back to the Uncertainty Problem

Just as previous unemployment rate forecasts have erred, so the forecasts of the models discussed are subject to uncertainty. Why? We

⁴The two sources for this figure are the St. Louis Federal Reserve Bank's estimates of potential GNP and the estimates made by the President's Council of Economic Advisers.

⁵The importance of labor force participation is that if a person drops out of the labor force, i.e., he stops looking for a job, he is no longer counted among the unemployed; this tends to reduce the unemployment rate.

have seen in previous sections how uncertainty can enter a forecast. For example, consider the Gap Models. Here, an assumption was made about the future values of potential output. Since this assumption might not completely conform to the future, an element of uncertainty enters the forecast of unemployment rates. Furthermore, though the growth of actual output is projected within the model, it, too, is subject to error. For instance, actual output growth is based on assumptions, such as the level of Government spending or taxation, which might not hold true because of difficulty in predicting Congressional action. Moreover, although the equations of the model are, on the average, quite accurate, they may still err for any single forecast.

Similar elements of uncertainty also enter the unemployment rate forecasts of the Wharton and Michigan models. However, despite the models' differences in theoretical approach, we should note that the unemployment rate forecasts presented in the table fall within a rather narrow range. We will discuss the differences in these forecasts in the next section.

The 1971 Econometric Model Forecasts

Discussion of the Forecasts. The table presents the 1971 forecasts of the five models. In comparing these forecasts, it is helpful to keep in mind the different assumptions about exogenous forces and other elements on which the forecasts are based, as well as the structure of the different models.⁶

The projections of GNP (in current dollars) all fall in a very narrow range, with the Michigan model projecting the lowest annual level of GNP and the St. Louis model (6 percent money supply growth) projecting the highest level. The rather low levels of Government expenditures assumed in the Michigan model's forecasts partially account for its low GNP. The St. Louis model (6 percent) forecasts the highest current dollar GNP. The importance of money in this model becomes evident when the money supply growth is lowered to 5 percent. Then, the current dollar GNP projection of this model becomes lower than the projections of the other four models. It might also be noted that the Wharton model's quarterly projections show a more rapid increase in current dollar GNP in the second quarter than any other model, but this is followed by rather sluggish

growth during the third quarter. This can be explained by the Wharton model's assumption of a six-week steel strike in the third quarter and rapid inventory accumulation in the quarters preceding the strike. Both the RCA and Michigan models also assume inventory buildups in the first half of 1971; however, neither assumes a strike.

Projections on unemployment rates all fall within a narrow range except for the Wharton model which projects the lowest rate. The low forecasts of the Wharton model can be partially explained by that model's labor force participation rate equation, which, as we have previously mentioned, would tend to dampen increases in the unemployment rate itself. The Michigan model projects the highest rate. The three other models, which all use a form of the GNP gap equation to project unemployment rates, each project an annual rate of unemployment of 5.8 percent in 1971. There seems to be no consensus among the models that unemployment rates will begin declining in late 1971, since Data Resources, RCA, and Wharton all predict unemployment rates rising in the fourth quarter of the year.

The behavior of prices as typified by the GNP deflator shows forecasts of quarterly price increases (annual rates) varying from 2.3 percent to 4.5 percent. Both the St. Louis and RCA models project a tapering-off of price increases throughout the year. The other three models show an acceleration of price increases near midyear, with slightly milder advances occurring toward year-end. The St. Louis model, which projects the most rapid price increases for 1971 as a whole, shows prices advancing at slightly more than a 4-percent annual rate in the fourth quarter. It is worth noting that both the St. Louis and the RCA models—the two monetary models—project the largest increases in prices in 1971.

The forecasts of real GNP follow directly from projections on money GNP and the GNP price index. Money GNP, when adjusted for price changes, equals real GNP. Forecasts of the following components of GNP—consumption, investment, and net exports⁷—are also given for some models.

Some Implications and Past Results. For most categories, the forecasts of the above models all fall within a narrow range. A description of the expected behavior of the U. S. economy in 1971 from the forecasts made by these models in late 1970 would be summarized as follows:

⁶The forecasts presented are mainly for illustrative purposes, and the reader should be aware that later forecasts by the above models are continually being released, which might outdate those presented in the table.

⁷In all models, Government spending is determined outside the model (exogenously) based upon the best available estimate.

The year 1971 will be one of gradual economic improvement. Real economic growth will resume a positive rate, with the economy expanding at 2.5 percent to 3.0 percent. Housing (residential investment in the table) should serve as a major stimulus to the economy. Price increases will be in the neighborhood of 4.0 percent, slowing from 1970's increase of 5.3 percent. However, the labor situation is not expected to improve significantly, with the unemployment rate expected to remain close to 6.0 percent.⁸

How much faith should one have in the accuracy of the forecasts? It must be kept in mind that they were made in late November and December 1970. Therefore, to the extent that the assumptions on which these forecasts were based have changed since then, or will change, the forecasts should be modified. Many uncertainties about 1971 exist. For example, will there be a steel strike on August 1? How long will it last? How will Congress respond to the President's proposed Federal budget? The answers to these and other yet unknown questions may materially affect the economy in 1971 and, thus, the accuracy of these forecasts.

In the past, the accuracy of the econometric models has been at least as good or better than that of many "judgmental" forecasters. Furthermore, the records of the models have shown improvement, and their value over other types of forecasts has been in their greater detail. In those years that the models were off, so were most of the "judgmental" economic forecasters. This was because events happened or economic relationships changed that were unforeseen by economists. Thus, the models also missed the mark, since they are, of course, of the economist's design.

Another reason the models may err is that they tend to influence policy decisions. For example, suppose that a set of forecasts are made when the outlook for the economy is weak. The forecasts show this and somewhat influence the Government in stimulating the economy. The Government's policy is successful; the economy does better than expected; and the original forecasts turn out to be, technically, incorrect.

Therefore, an econometric model must be continually revised and updated to account for Governmental policy actions, new theoretical developments, and changes in economic relationships. Forecasts have to be continually run and rerun through the models, since the degree of economic uncertainty about future events

⁸These forecasts should not be interpreted as official forecasts of the Federal Reserve Bank of Atlanta or of the Federal Reserve System.

Model and Period	Current GNP	Price Change (Percent, Ann. Rate) ³
Michigan		
1st Qtr.	1013.4	2.3
2nd Qtr.	1034.8	4.2
3rd Qtr.	1053.0	2.4
4th Qtr.	1069.5	2.9
Year	1042.7	3.5
Data Resources, Inc.		
1st Qtr.	1017.8	2.7
2nd Qtr.	1039.6	2.5
3rd Qtr.	1052.0	4.3
4th Qtr.	1070.8	2.8
Year	1045.1	3.8
Wharton		
1st Qtr.	1019.7	2.6
2nd Qtr.	1044.9	2.9
3rd Qtr.	1050.7	3.5
4th Qtr.	1067.3	2.9
Year	1045.7	3.5
St. Louis—6% ¹		
1st Qtr.	1016.1	4.5
2nd Qtr.	1032.7	4.3
3rd Qtr.	1057.5	4.2
4th Qtr.	1076.7	4.1
Year	1045.8	4.4
St. Louis—5% ²		
1st Qtr.	1015.6	4.5
2nd Qtr.	1030.7	4.3
3rd Qtr.	1053.2	4.2
4th Qtr.	1069.7	4.0
Year	1042.3	4.4
RCA—6%		
1st Qtr.	1013.2	4.1
2nd Qtr.	1035.5	4.0
3rd Qtr.	1052.9	4.0
4th Qtr.	1071.5	3.4
Year	1043.3	4.2
Avg. Ann. Forecast	1044.5	4.0
Ann. Range—Low	1042.7	3.5
High	1045.8	4.4

¹Percentages indicated here and directly below indicate percentage assumption of annual growth rate of the money supply.

²Omitted from Average Ann. Forecast and Low and High Range.

³Computed as % change in GNP implicit deflator, 1958=100.

diminishes as one draws closer to the forecast period.

Summary and Conclusions

In summary, an examination of the forecasts reveals that despite varying size (in terms of equations and variables) and theoretical approach, these models tend to agree. This fact of agreement is, obviously, no proof of the validity of the forecasts.

The major value of the forecasts is that they give the Government policy maker or the business decision maker a detailed set of data about the future of the economy that will prove to be true if the underlying theory and assumptions do

DESPITE VARYING THEORETICAL APPROACHES, ECONOMETRIC MODELS TEND TO AGREE FOR 1971
(Figures in Billions of Current Dollars Unless Otherwise Noted)

Real GNP ⁴	Real GNP Growth (Percent, Ann. Rate) ⁵	Consumption	Total Investment	Business Investment	Inventory Investment (Net Change)	Residential Investment	Net Exports ⁶	Unemp. Rate (Percent)
735.3	9.9	643.1	139.6	103.1	2.1	34.4	4.2	6.0
743.0	4.2	655.6	143.4	103.3	4.7	35.3	3.2	6.2
751.6	4.6	666.2	145.6	103.9	4.9	36.8	5.5	6.1
757.9	3.4	676.3	147.7	105.1	4.3	38.3	5.3	6.1
747.0	3.3	660.3	144.1	103.9	4.0	36.2	4.6	6.1
735.1	8.7	643.9	139.2	102.9	2.0	34.3	4.7	5.9
746.3	6.2	655.2	146.6	103.0	8.4	35.2	5.0	5.7
747.3	0.6	667.0	142.7	104.1	2.3	36.3	5.6	5.6
755.4	4.4	677.6	145.9	104.6	4.3	37.0	5.9	5.8
746.0	3.0	660.9	143.6	103.7	4.3	35.7	5.3	5.8
739.7	8.0	640.3	145.1	104.8	5.0	35.3	4.4	5.5
752.3	6.8	653.7	153.8	106.3	9.7	37.8	3.9	4.9
749.8	-1.3	659.6	147.9	107.0	0.7	40.2	4.5	5.2
756.7	3.7	669.6	151.0	105.2	5.0	40.8	4.7	5.3
749.6	3.4	655.8	149.5	105.8	5.1	38.5	4.4	5.2
733.5	1.8	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	5.6
737.7	2.3	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	5.8
747.7	5.6	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	5.9
753.7	3.3	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	5.8
743.2	2.3	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	5.8
733.2	1.6	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	5.6
736.3	1.7	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	5.8
744.8	4.7	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	6.0
749.1	2.3	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	6.0
740.9	2.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	5.9
732.4	6.2	638.3	n.a.	104.9	n.a.	30.9	n.a.	5.9
741.1	4.8	650.6	n.a.	106.9	n.a.	32.7	n.a.	5.8
746.5	2.9	664.8	n.a.	107.9	n.a.	34.5	n.a.	5.7
752.8	3.4	675.8	n.a.	108.5	n.a.	35.8	n.a.	5.8
743.2	2.6	657.4	n.a.	107.1	n.a.	33.5	n.a.	5.8
745.8	2.8	658.6	145.7	105.1	4.5	36.0	4.8	5.8
743.2	2.0	655.8	143.6	103.7	4.0	33.5	4.4	5.2
749.6	3.4	660.9	149.5	107.1	5.1	38.5	5.3	6.1

⁴Current dollar GNP adjusted to reflect price changes by use of GNP implicit deflator, 1958=100.

⁵First quarter 1971 growth rates are based on each model's projections of the fourth quarter 1970 levels of real GNP, which differed among the models at the time of forecast.

⁶Exports minus Imports.

DATES OF FORECAST RELEASE: Michigan and Wharton: November 19, 1970; St. Louis: December 14, 1970; Data Resources: December 15, 1970; and RCA Corporation: December 1970.

not undergo radical changes. The models and their forecasts provide the decision maker with valuable tools, both to simulate the various effects of alternative policy decisions that may be under his control and to evaluate the economic effects of those beyond his control. These forecasts can be, and are, continually updated as new economic facts and events unfold.

Are the 1971 forecasts presented in this article accurate? Which one is the most accurate? At this point, it is impossible to tell. From what we know now, these forecasts appear to be reasonable, but who can be certain what this year will bring? Next year we will print the actual data for the forecasts presented here. You be the judge!

APPENDIX A CLOSER LOOK AT THE MODELS

In the following descriptions, each model is examined with regard to size and design. An overview of each model's treatment of monetary policy, fiscal policy, and price movements is also included.

The University of Michigan Model

The University of Michigan econometric model (referred to as the DLH-III) is a small-to-medium-size model, consisting of 35 equations and eight identities. These formulations are divided among three main blocks: a Supply Block, an Expenditure Block, and an Income Shares Block. Each block

describes a particular set of facts about that sector of the economy. Therefore, the Supply Block explains the behavior of wage rates, prices, and productivity, economic facts of life that are inherent in determining the amount and nature of the supply of goods and services. The Expenditure Block develops formulations to account for such major components of GNP as consumer expenditures on automobiles and other durables, business investment in plant and equipment, and residential housing starts. The Income Shares Block contains equations and identities that explain such payments that provide income to individuals or organizations, such as corporate profits, dividends, private wages and salaries, and taxes.

In this model, monetary policy is treated in a Keynesian framework by developing an interest rate variable based upon movements in short- and long-term interest rates. This interest rate variable is used to determine those types of spending in the economy that are related to the rate of interest. For example, the model relates the level of Business Fixed Investment to the rate of investment in certain previous periods and also to several selected interest rates. An interest rate measure is also considered in deriving an equation for the number of housing starts. Housing starts are, in turn, used with two other variables (including another interest rate measure) to determine the dollar value of residential construction. The result in the above formulations would be such that when monetary policy is eased by the Federal Reserve, interest rates would fall. This would increase the quantity of loans demanded for investment and housing needs and, consequently, stimulate expenditures in these areas. On the other hand, a tightening of monetary policy would raise interest rates, which would, in turn, discourage spending in these areas.

Fiscal policy, the conscious adjustment of taxation and/or expenditure programs by the Government in order to influence economic activity, is incorporated mainly through the technique of including Government expenditures in a definition (identity) of GNP and then making other economic variables partially a function of GNP. Thus, an increase in Government spending, which increases GNP, would tend to increase other economic variables, such as employment, wages and salaries, personal consumption, and several others. Taxation variables are also built into the model to reflect increased revenues of governmental units that would be affected by changes in income.

Price movements in the nonfarm sector are based on supply factors such as the level of capacity utilization and expected changes in unit labor costs. Demand factors are considered by including an unemployment variable and by assuming that a low rate of unemployment indicates a higher degree of demand for labor. This leads to higher expected unit labor costs and, thus, to higher prices.

The DRI Model of the U. S. Economy

The Data Resources model is the largest model of the five presented in this article. There are 109 equations and 133 identities.

Monetary policy actions are basically handled in a Keynesian fashion similar to the Michigan model. Various types of interest rate variables are expressed

in the model as partial determinants of such items as business investment, residential construction, and state and local spending.

Fiscal policy can be simulated with the model by varying Government expenditures or taxes. Seven equations are included for this purpose.

Price changes are computed by using 8 equations that include separate price index equations for such variables as state and Federal Government purchases and various classifications of personal consumption (durable goods, nondurable goods, etc.).

As a commercial model, Data Resources offers its users the access to a Data Bank in which 3,000 business and economic time series are stored. Data Resources also maintains an "equation library," and has developed a set of industry equations. The industry equations are designed to provide a bridge between the movements of the broad aggregates called the GNP accounts (investment, consumption, etc.) and a specific industry such as textiles or chemicals. A user could, therefore, estimate his own future sales or production in relation to DRI's forecast of the economy.

Wharton EFU Model

This model ranks among the large econometric models. It contains 47 equations and 29 identities. Besides being used for prediction of a large number of economic variables, it is also used for various monetary and fiscal policy simulations.

Money's role in the Wharton model is surprising. Though the final effect of monetary policy on GNP is about the same as it is in the long run for a comparable fiscal policy, the effects in the first year are quite small, because of the lags involved, when compared with fiscal policy. In fact, in the model, the long-run effects of a change toward easier monetary policy will actually increase the unemployment rate slightly as businesses find it relatively cheaper to substitute capital for workers. A rapid growth rate of GNP appears to be the main benefit of an expansionary monetary policy in the Wharton model. Accordingly, policy makers, when using the model, would tend to emphasize fiscal policy over monetary policy because of its positive employment effects.

Through simulations this model also analyzes the effects of alternate fiscal policies. However, there is no specific fiscal sector in the model, since taxes and transfers are incorporated into most of the spending equations. Also, Government expenditures for purchases of goods and services and for defense are considered exogenous.

The model contains seven price equations plus a price identity to determine the GNP price deflator (the index of price change). However, the manufacturing price equation seems to be the key equation, since manufacturing prices are used along with other demand-related variables to determine all other prices in the model. The manufacturing price equation has as independent variables, unit labor costs and capacity utilization, along with *lagged values* of manufacturing prices. Thus, demand-pull, cost-push, and wage-price spiral influences are present and affect prices.

The St. Louis Federal Reserve Model

This model is what is technically called a *reduced form* model. In this particular model, the total spending (GNP) equation—the heart of the model—is an equation with changes in money stock and changes in “high-employment Federal expenditures” as the independent as well as the exogenous variables. This equation, though sufficient for predictive purposes is not, because of its summary nature (reduced form), conducive to exact policy simulations. High-employment Federal expenditures are expenditures on goods and services plus transfer payments (mainly unemployment benefits) adjusted to full employment levels.

As is well known, the St. Louis model places the greatest emphasis on monetary policy. In this model, it is monetary actions that play the strategic role; fiscal policy actions especially for periods over a year in length have almost no effect on output or prices. However, the exact structure of the money sector and the fiscal sector is impossible to identify because only the reduced form of the model is given.

Price changes are transferred through the model by two variables—demand pressure and price expectations. Demand pressure is determined by the difference between the change in total spending and the potential change in output—the greater this difference, the greater the demand pressure. Price expectations are determined in the model by past price changes and a measure of resource utilization—the unemployment rate. Thus, price changes are basically determined by demand forces. However, including the lagged values for demand pressure does tend to pick up the effect of input price changes and the effect of changes in costs of production.

RCA Econometric Model

The RCA econometric model is a monetary model similar in form to the St. Louis model. However, it is what the authors of the model call an “outside-in” model. It starts with an equation that relates GNP to exogenous monetary and fiscal factors (similar to St. Louis total spending equation); it then determines the components of GNP, such as consumption of durables and nondurables and private investment—both residential and business. Also, certain microeconomic variables, such as color TV sales, are estimated for internal use. Overall, the model has 13 equations, 6 identities, and a price-expectation equation.

As with the St. Louis model, monetary influences are the strongest on current dollar GNP. The RCA spending equation does not have as many lagged terms as the same equation in the St. Louis model; hence, though the immediate effects of monetary and fiscal policy can be determined, the delayed effects of such policies cannot. Again, the effects of many precise types of fiscal or monetary policies cannot be estimated, since the spending equation is a reduced form equation.

The GNP price deflator is determined as a function of expected price changes, changes in GNP, change in potential real GNP, and the gap between potential and real GNP. Therefore, this equation's variables are

similar to the variables in the St. Louis model's price equation.

GLOSSARY

Coefficient: A numerical or alphabetic symbol placed before a variable; often referred to as a parameter

Correlation: The degree to which variables move together; the extent to which movements of the variables are related

Dependent Variable: The variable that is determined by the movements of another variable(s)

Econometric Model: An equation or system of equations, statistically tested, representing the operations of economic forces in the “real world”

Endogenous: Those variables or facts explained within the framework of an economic model

Exogenous: Those variables or facts not explained within an economic model but imposed upon the model by outside forces

Functional Relationship: A statement of cause and effect; that is, a relationship that shows how one or more variables affect another variable

Identification Problem: The problem of assigning coefficient values to the equations of an econometric model by using the correct statistical tests

Identity: A statement of definition; a relationship that holds true at all times

Independent Variable: The variable that initiates change; it determines the value of other variables

Labor Forces Participation Rate: Ratio of the total labor force (including armed services) to the total noninstitutional population

Lagged Values of Variables: Values of variables pertaining to previous time periods. For example, consumption expenditures today might be related to both today's income and yesterday's income. Yesterday's income is a lagged variable.

Potential Output (Potential Gross National Product): The value of the final output of goods and services produced in a year if all resources (land, labor, and capital) are fully utilized

Reduced Form: An equation relating an endogenous variable to several exogenous and lagged endogenous variables

Simulation: The process of imposing various hypothetical conditions on a model in order to observe their effects on certain variables

Variable: A quantity that may assume a succession of values, which need not be distinct

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Mississippi in 1970: Paddling Against the Current

by William N. Cox, III

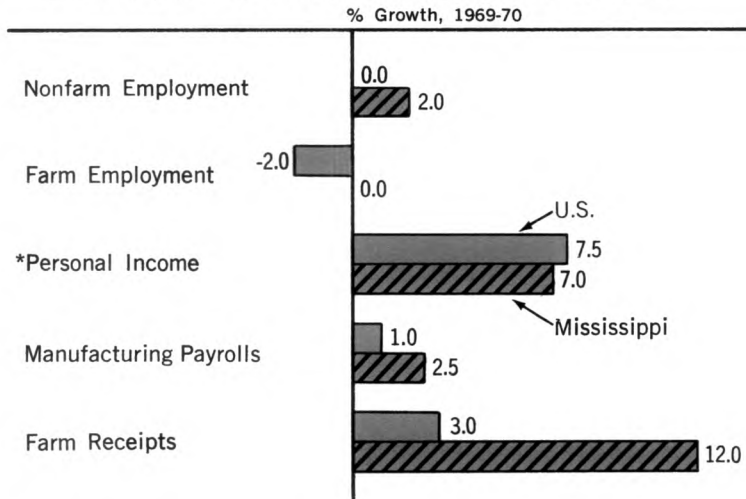
In an earlier assessment of Mississippi's economy, we described how the state's increasing industrialization was bringing with it an increasing interdependence between Mississippi's economic fortunes and those of the nation.¹ The same article went on to point out that this was particularly true for the state's growing manufacturing sector, many of whose firms depend on markets outside the state. As goes the nation, so goes Mississippi. Or so we might expect.

For the national economy, 1970 was a disappointment. It was a year in which employment and income and production barely grew, especially in comparison with the boom years of the late 1960's. In view of the increasing interdependence between Mississippi and the nation, we would expect to find that 1970 also came as a letdown for Mississippi's economy. And, in fact, it was.

This assessment of Mississippi's 1970 economic performance should be tempered, therefore, by realizing what happened nationally and by recognizing that Mississippi had to paddle against the thrust of an adverse national current. In doing this, Mississippi met with considerable success.

¹William N. Cox, III, "Mississippi: Industrialization Brings Interdependence," *Monthly Review*, Federal Reserve Bank of Atlanta, May 1968.

**Mississippi's key economic indicators . . .
 . . . compared favorably with the nation's in 1970**



*Based on 3 qtrs. data

Better Than National Worse Than Usual

Mississippi paddled successfully against the current in 1970. Although the state's economic pace was slower than it had been during the late Sixties, it, nevertheless, generally outperformed that of the nation.

What happens to nonfarm employment is of prime importance to Mississippi because of the continuing need to provide additional jobs for workers coming off the farm.² More nonfarm jobs did become available in 1970—2 percent more than in 1969—but the increase was disappointingly below the 4-percent annual growth recorded in the 1960's. Even so, Mississippi's 2-percent growth looked good when compared with the national no-growth situation.

In Mississippi, manufacturing employment actually fell a bit in 1970, reflecting small decreases in both durable and nondurable sectors. In the

durable goods sector, Mississippi registered only a ½-percent employment decline, whereas the nation experienced a decrease of 5½ percent. Here again, Mississippi paddled against an adverse national current and, here again, had some success in doing it. In nondurable manufacturing employment, the state and the nation both posted declines of about one percent.

Construction provided a big employment boost in 1970. Jobs in that sector grew a surprising 6½ percent, contrasting with a national decline of 2½ percent. Two special factors helped. The Gulf Coast was engaged in post-Camille rebuilding, and there was a burst of activity surrounding the Ingalls-Litton shipyard at Pascagoula.

Although farm employment in Mississippi did not grow during 1970, this was better than the nation's 2-percent decline in farm jobs during that year and the state's ½-percent decline in 1969. Farm cash receipts rose once again in 1970, largely because of national increases in livestock prices. For a change, a national current was flowing the right way. Crop receipts edged down slightly, also in line with the national movement.

Personal income is about as good an indicator of overall economic activity as is available. In Mississippi, it rose about 7 percent in 1970, about equal to the national increase of 7½ percent. The manufacturing payroll portion outpaced the nation's, up 2½ percent for Mississippi and up 1 percent for the U. S.

²William N. Cox, III, "Mississippi Nonfarm Jobs in the Sixties: A Sneak Preview," *Monthly Review*, Federal Reserve Bank of Atlanta, November 1969. Nonfarm jobs are a prime target of the state's Balance Agriculture with Industry (BAWI) program.

A Closer Look

Let us return for a closer look at the crucial category of nonfarm employment. Mississippi's nonfarm job growth in 1970 (2 percent) was higher than the nation's (0 percent). A statement of this kind can sometimes be misleading, however. If a state performs better than the nation does in nonfarm job growth, it may be because job growth in all, or nearly all, industries ran ahead of job growth in those industries nationally.

But there may be another reason; namely, the employment mix is different at the state level than it is at the national level. An extreme example serves to illustrate this point. Suppose that all of a state's nonfarm jobs are in a single industry. Suppose, too, that nationally, total nonfarm employment grows 5 percent but, that in industry X, employment actually shrinks 10 percent. Then if nonfarm jobs in the state merely held steady, it would be an impressive overall performance—impressive despite the nation's 5-percent increase in total employment.

Admittedly, this example is far-out. But more subtle distortions of the same sort are introduced whenever we ignore state-national differences

in employment mix. The more these mixes differ, the greater the possibility that naive comparisons will prove to be inaccurate.

One way of avoiding this employment-mix trap is to make industry-by-industry comparisons. The table does this for Mississippi. It suggests that 1970 job growth in almost all of Mississippi's industries outpaced national growth in those same industries. Returning to our original theme, we can say with renewed confidence that Mississippi was successful in paddling against the current.

There is another way of allowing for differences in state-national employment mix. We can figure another hypothetical growth rate for nonfarm jobs by using the industry-by-industry percentage growth for Mississippi and combining it with the employment mix for the U. S.

When this is done, we find that Mississippi's nonfarm job growth would have been higher than it actually was if its employment mix in 1970 had been the same as the nation's. The **hypothetical increase**, using the national job mix, was about 4 percent (compared with an **actual** increase of only 2 percent). In other words, Mississippi's past employment mix, with its greater concentration of slower growing industries, handicapped the state's nonfarm employment growth in 1970.

PERCENTAGE CHANGE IN EMPLOYMENT 1969-70		
	Miss.	U. S.
Total Employment.....	1.0	1.0
Farm	0.0	- 2.0
Nonfarm	2.0	0.0
Construction	6.5	- 2.5
Mining	1.5	0.5
Manufacturing	- 1.0	- 3.5
Durable Goods.....	- 0.5	- 5.5
Lumber	3.0	- 4.5
Furniture	- 6.5	- 5.0
Transportation Equipment.....	2.0	-11.5
Nondurable Goods	- 1.0	- 1.0
Food	3.0	0.0
Apparel	- 2.0	- 2.0
Transportation	3.5	1.5
Trade	2.5	1.5
Finance, Insurance, Real Estate.....	4.0	3.5
Services	1.5	3.0
Government	2.0	2.0

Better Things to Come?

It is almost unquestionable that better times are on the way. In retrospect, it seems likely that last year's performance will be viewed as subpar. For 1971, there is a big reason for optimism, since the national economy is now showing signs of responding to more expansive monetary and fiscal policies. Mississippi will not have to fight as strong an adverse current as in 1970. But there are more

grounds for optimism than just simple interpolation of our expectations about the national economy. For one thing, reductions in mortgage rates and increases in housing starts, nationally, have a disproportionate effect on Mississippi because of the importance of the state's lumber industry. Some of this stimulus is already materializing. For another thing, the contracts awarded to Ingalls-Litton for 47 ships can be expected to keep the Gulf Coast area humming through 1975. Finally, one can reasonably expect that devastating visits like the one from Hurricane Camille are the exception rather than the rule. ■

Bank Announcements

FEBRUARY 1, 1971
GULF COAST BANK
Abbeville, Louisiana

Opened for business as a par-remitting nonmember.

FEBRUARY 4, 1971
FLORIDA BANK OF COMMERCE
Clearwater, Florida

Opened for business as a nonmember. Officers: Gordon R. Williams, president; Norman H. Mueller, executive vice president and chief executive officer; O. C. Neal, senior vice president; Reginald S. Wareham, vice president;

and Ethel M. Miller, cashier. Capital, \$400,000; surplus and other capital funds, \$350,000.

FEBRUARY 16, 1971
THE COLLIER COUNTY BANK
Naples, Florida

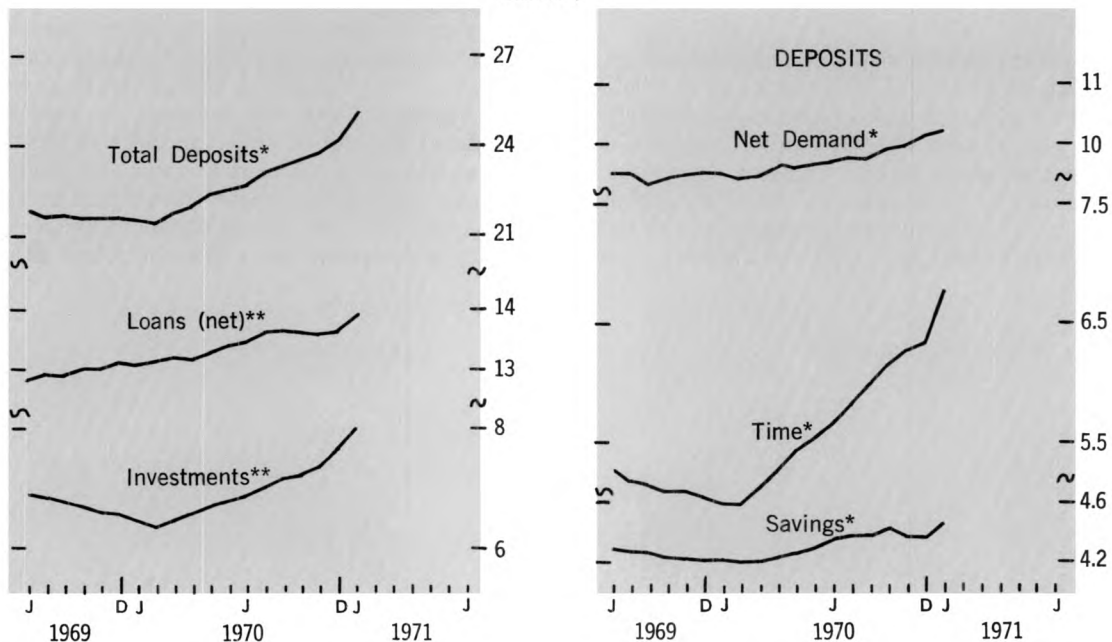
Opened for business as a nonmember. Officers: Mrs. Mamie B. Tooke, president and chairman; Ward E. Boehner, Jr., executive vice president; and John H. Druffel and Addison B. Miller, vice presidents. Capital, \$600,000; surplus and other capital funds, \$600,000.

FEBRUARY 22, 1971
**BARNETT BANK OF SEMINOLE COUNTY,
NATIONAL ASSOCIATION**
Altamonte Springs, Florida

Opened for business as a member. Officers: George W. Foster, president; Mary Ellen Sicoutry, cashier; and Gwendolyn O. Inness, assistant cashier. Capital, \$400,000; surplus and other capital funds, \$200,000.

BANKING STATISTICS

Billion \$



LATEST MONTH PLOTTED: JANUARY

Note: All figures are seasonally adjusted and cover all Sixth District member banks.

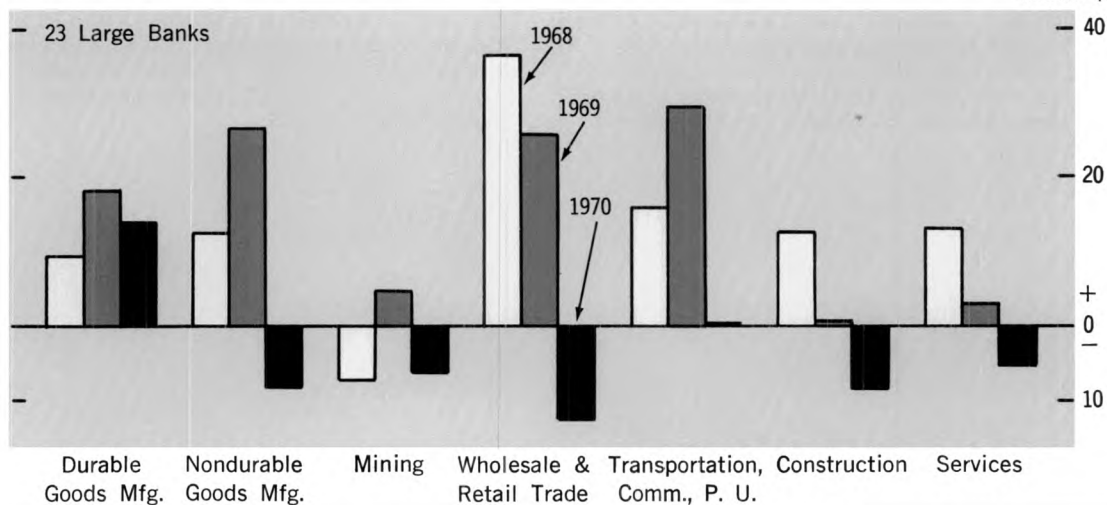
*Daily average figures **Figures are for the last Wednesday of each month.

SIXTH DISTRICT

BANKING NOTES

CHANGES IN TERM LOAN CATEGORIES

Million \$



DISTRICT TERM LENDING TURNS DOWN

During 1970, business term loans at the larger District commercial banks declined \$29 million—a drop of 3.8 percent. This small decline contrasts sharply with the gains in 1969 and 1968—years when term lending advanced \$124 million and \$86 million, respectively.¹

Term lending is generally less responsive than short-term lending is to the shifts in bank lending policies and changes in the relative cost and availability of credit from nonbank sources. For example, after rapidly increasing during the first half of 1969, short-term business loans at large District banks tapered off during the second half. Term loans, on the other hand, did not decline until early 1970, when business demands eased for bank credit in general, thus enabling banks to cut back their term loans. Even though many District bankers may have wanted to cut back their term loans earlier, a considerable lag is often involved before previously established lines of credit are drawn down by business firms.

Last year's weakness in term loans was spread across most types of commercial and industrial borrowers. In previous years when consumer spending was strong, wholesalers and retailers made considerable use of term loans. Because sales were sluggish last year, however, term loans to wholesalers advanced only slightly, and those to retailers declined nearly \$14 million. Except for machinery and transportation equipment manufacturing—chiefly in Florida—term loan activity to durable goods manufacturers also failed to increase.

Banks in Georgia and Florida usually provide the bulk portion of the District's construction loans extended for longer than a one-year period. Last year, the banks in Georgia sharply reduced such loans while banks in Florida advanced their lending only slightly.

Likewise, at banks in the Gulf Coast states, the use of intermediate- and long-term credit for the exploration of crude petroleum and natural gas and for petroleum refining declined—by nearly \$14 million—over the same period. Except for the drop in lending to petroleum refiners, the loans to nondurable goods manufacturers, however, did not change in the District.

¹John M. Godfrey, "Term Lending: A Lagging Respondent to Monetary Restraint," *this Review*, June 1970, pp. 80-83. This article should also be consulted for a more complete description of the banks included and the definition of term business loans and loan categories.



Florida banks typically account for nearly half of the District's intermediate- and long-term loans to service type businesses. In 1970, however, these banks reported more than a \$12-million decline in loans for firms providing lodging, amusement, recreation, and other nonbusiness services. In contrast, service loans advanced in Alabama, southern Louisiana, and southern Mississippi.

The lack of growth of term loans during 1970—a year following a period of restrictive monetary policy—is similar to the period following the "credit crunch" of 1966. Then, as in 1970, banks did not begin expanding their term loans immediately following the shift in monetary policy. Generally, banks first attempt to rebuild their liquidity before being willing to approve loans with maturities averaging three-to five years. Corporate borrowers will wait until business activity picks up before they feel compelled to seek additional bank credit to be used for building up their working capital and for making additions to plant and equipment. After the monetary stringency in 1966, more than 18 months passed before term lending turned up, thus providing some reason for not expecting a turnaround in term lending until later this year.

There are other factors that point to an upturn in term lending during the latter months of 1971. Term loan advances are typically strongest in the last six months of the year. If business activity is strong and these patterns reoccur, then we should see noticeable gains in term lending at the larger District banks during the last half of 1971.

JOHN M. GODFREY

Sixth District Statistics

Seasonally Adjusted

(All data are indexes, 1957-59 = 100, unless indicated otherwise.)

	Latest Month	One Month Ago	Two Months Ago	One Year Ago		Latest Month	One Month Ago	Two Months Ago	One Year Ago
SIXTH DISTRICT					UNEMPLOYMENT RATE				
INCOME AND SPENDING					(Percent of Work Force)† Jan.				
Manufacturing Payrolls Jan.	264	260	261	258	Avg. Weekly Hrs. in Mfg. (Hrs.) Jan.				
Farm Cash Receipts Dec.	155	129	167	150	5.0	5.5	5.3	3.8	
Crops Dec.	143	128	124	122	40.5	39.8	40.2	40.5	
Livestock Dec.	208	164	175	202	FINANCE AND BANKING				
Installment Credit at Banks* (Mil. \$)					Member Bank Loans Jan.	334	336	332	306
New Loans Jan.	321	341	323	305	Member Bank Deposits Jan.	244	240	233	210
Repayments Jan.	324	338	327	289	Bank Debits** Jan.	265	257	258	248
EMPLOYMENT AND PRODUCTION					FLORIDA:				
Nonfarm Employment† Jan.	154	152	152	153	INCOME				
Manufacturing Jan.	145	145	144	150	Manufacturing Payrolls Jan.	356	337	346	353
Non-durable Goods Jan.	136	136	136	138	Farm Cash Receipts Dec.	171	124	286	172
Food Jan.	111	110	110	111	EMPLOYMENT				
Textiles Jan.	110	110	110	116	Nonfarm Employment† Jan.	180	180	180	176
Apparel Jan.	174	175	175	176	Manufacturing Jan.	172	171	174	178
Paper Jan.	127	127	126	130	Nonmanufacturing Jan.	181	181	181	176
Printing and Publishing Jan.	157	157	156	154	Construction Jan.	137	129	130	143
Chemicals Jan.	139	141	141	143	Farm Employment Jan.	87	90	90	84
Durable Goods Jan.	159	159	158	168	UNEMPLOYMENT RATE				
Lbr., Wood prods., Furn. & Fix. Jan.	108	106	106	109	(Percent of Work Force)† Jan.	3.9	4.2	4.2	2.7
Stone, Clay, and Glass Jan.	131	130	130	134	Avg. Weekly Hrs. in Mfg. (Hrs.) Jan.	41.6	40.5	41.3	40.3
Primary Metals Jan.	138	138	138	135	FINANCE AND BANKING				
Fabricated Metals Jan.	173	173	174	180	Member Bank Loans Jan.	421	420	408	386
Machinery, Elec. & Nonelec. Jan.	254	256	258	265	Member Bank Deposits Jan.	300	294	292	259
Transportation Equipment Jan.	186	186	179	211	Bank Debits** Jan.	318	308	312	294
Nonmanufacturing Jan.	157	155	154	153	GEORGIA				
Construction Jan.	143	132	131	146	INCOME				
Transp., Comm., & Pub. Utilities Jan.	135	135	134	133	Manufacturing Payrolls Jan.	260	262	258	266
Trade Jan.	149	147	148	148	Farm Cash Receipts Jan.	171	93	129	189
Fin., ins., and real est. Jan.	166	165	165	161	EMPLOYMENT				
Services Jan.	175	175	175	172	Nonfarm Employment† Jan.	152	152	152	154
Federal Government Jan.	126	125	126	126	Manufacturing Jan.	136	137	135	145
State and Local Government Jan.	191	190	188	181	Nonmanufacturing Jan.	161	160	160	159
Farm Employment Jan.	57	56	54	55	Construction Jan.	149	148	145	155
UNEMPLOYMENT RATE					Farm Employment Jan.	49	50	48	49
(Percent of Work Force)† Jan.	4.6	4.8r	4.8	3.5	UNEMPLOYMENT RATE				
Insured Unemployment Jan.	3.0	2.9	3.0	2.3	(Percent of Work Force)† Jan.	4.0	4.2	4.0	3.0
(Percent of Cov. Emp.) Jan.	40.7	40.1	40.3	40.3	Avg. Weekly Hrs. in Mfg. (Hrs.) Jan.	40.4	39.5	39.4	39.6
Avg. Weekly Hrs. in Mfg. (Hrs.) Jan.	214	263	221	358	FINANCE AND BANKING				
Construction Contracts* Jan.	224	318	244	280	Member Bank Loans Jan.	362	369	357	348
Residential Jan.	205	217	202	424	Member Bank Deposits Jan.	257	252	252	230
All Other Jan.	165	164	166	167	Bank Debits** Jan.	349	339	340	317
Electric Power Production** Dec.	102	97	101	103	LOUISIANA				
Cotton Consumption** Dec.	303	309	311	232	INCOME				
Petrol. Prod. in Coastal La. and Miss.** Jan.	244	242	246	239	Manufacturing Payrolls Jan.	230	229	229	218
Manufacturing Production Dec.	210	210r	209	206	Farm Cash Receipts Dec.	160	167	187	136
Non-durable Goods Dec.	230	217	209	206	EMPLOYMENT				
Food Dec.	215	210	209	206	Nonfarm Employment† Jan.	134	132	132	134
Textiles Dec.	235	236r	235	229	Manufacturing Jan.	122	120	119	124
Apparel Dec.	264	264	265	256	Nonmanufacturing Jan.	138	135	134	139
Paper Dec.	197	198	196	203	Construction Jan.	132	122	118	137
Printing and Publishing Dec.	164	166	167	171	Farm Employment Jan.	52	49	49	49
Chemicals Dec.	267	270	269	261	Unemployment Rate Jan.	6.5	6.6	6.8	5.4
Durable Goods Dec.	285	281	291	280	(Percent of Work Force)† Jan.	41.9	42.0	43.2	42.5
Lumber and Wood Dec.	171	171r	169	166	Avg. Weekly Hrs. in Mfg. (Hrs.) Jan.				
Furniture and Fixtures Dec.	183	184	184	186	FINANCE AND BANKING				
Stone, Clay and Glass Dec.	171	168	169	172	Member Bank Loans* Jan.	304	298	295	277
Primary Metals Dec.	198	196	202	202	Member Bank Deposits* Jan.	203	201	198	176
Fabricated Metals Dec.	244	242	241	247	Bank Debits**/** Jan.	233	210	221	214
Nonelectrical Machinery Dec.	365	340r	358	361	MISSISSIPPI				
Electrical Machinery Dec.	626	624	657	558	INCOME				
Transportation Equipment Dec.	345	341	360	353	Manufacturing Payrolls Jan.	298	297	297	274
FINANCE AND BANKING					Farm Cash Receipts Dec.	142	146	131	118
Loans*					EMPLOYMENT				
Large Member Banks Jan.	369	372	362	342	Nonfarm Employment† Jan.	154	152	152	152
Large Banks Jan.	305	311	299	289	Manufacturing Jan.	161	160	160	161
Deposits*					Nonmanufacturing Jan.	151	149	149	148
All Member Banks Jan.	258	254	252	225	Construction Jan.	172	160	159	183
Large Banks Jan.	212	210	204	186	Farm Employment Jan.	48	47	46	47
Bank Debits**/** Jan.	301	289	292	276	ALABAMA				
ALABAMA					MISSISSIPPI				
INCOME					INCOME				
Manufacturing Payrolls Jan.	233	224	228	228	Manufacturing Payrolls Jan.	298	297	297	274
Farm Cash Receipts Dec.	150	114	114	143	Farm Cash Receipts Dec.	142	146	131	118
EMPLOYMENT					EMPLOYMENT				
Nonfarm Employment† Jan.	133	132	132	134	Nonfarm Employment† Jan.	154	152	152	152
Manufacturing Jan.	133	133	133	127	Manufacturing Jan.	161	160	160	161
Nonmanufacturing Jan.	134	131	131	133	Nonmanufacturing Jan.	151	149	149	148
Construction Jan.	118	99	100	127	Construction Jan.	172	160	159	183
Farm Employment Jan.	57	57	53	57	Farm Employment Jan.	48	47	46	47

	Latest Month	One Month Ago	Two Months Ago	One Year Ago
Unemployment Rate (Percent of Work Force)	Jan. 4.7	4.5	5.1	3.9
Avg. Weekly Hrs. in Mfg. (Hrs.)	Jan. 40.0	40.4	40.0	40.9
FINANCE AND BANKING				
Member Bank Loans*	Jan. 468	470	460	425
Member Bank Deposits*	Jan. 307	305	301	277
Bank Debits**	Jan. 298	296	298	284

TENNESSEE

	Latest Month	One Month Ago	Two Months Ago	One Year Ago
INCOME				
Manufacturing Payrolls	Jan. 250	254	247	240
Farm Cash Receipts	Dec. 124	156	122	116

EMPLOYMENT

	Latest Month	One Month Ago	Two Months Ago	One Year Ago
Nonfarm Employment†	Jan. 154	149	149	151
Manufacturing	Jan. 154	153	152	157
Nonmanufacturing	Jan. 154	147	147	148
Construction	Jan. 189	162	157	175
Farm Employment	Jan. 58	55	53	59
Unemployment Rate (Percent of Work Force)†	Jan. 4.6	4.7	4.9	3.9
Avg. Weekly Hours in Mfg. (Hrs.)	Jan. 40.3	39.9	39.6	39.9

FINANCE AND BANKING

	Latest Month	One Month Ago	Two Months Ago	One Year Ago
Member Bank Loans*	Jan. 354	366	347	325
Member Bank Deposits*	Jan. 233	232	230	203
Bank Debits**	Jan. 294	283	277	262

*For Sixth District area only; other totals for entire six states **Daily average basis †Preliminary data r-Revised N.A. Not available
 ‡Employment and payroll figures for Florida have been adjusted to new bench mark data.

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; industrial use of elec. power, Fed. Power Comm.; 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.

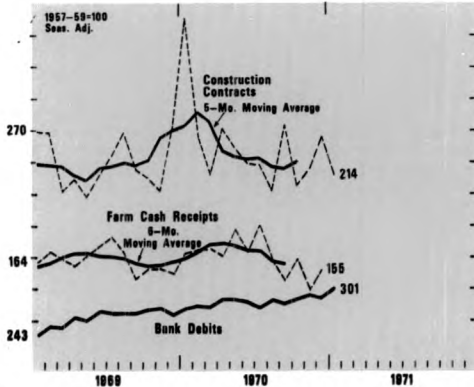
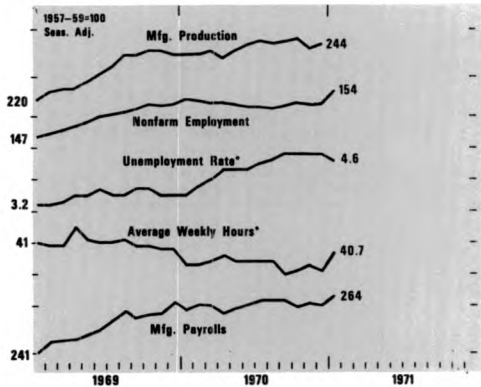
Debits to Demand Deposit Accounts

Insured Commercial Banks in the Sixth District (In Thousands of Dollars)

	Percent Change					Percent Change					
	Jan. 1971	Dec. 1970	Jan. 1970	Dec. 1970	Jan. 1970	Jan. 1971	Dec. 1970	Jan. 1970	Dec. 1969	Jan. 1969	
STANDARD METROPOLITAN STATISTICAL AREAS†											
Birmingham	2,083,890	2,301,729	2,011,268	- 9	+ 4						
Gadsden	73,376	78,170	70,472	- 6	+ 4						
Huntsville	222,143	247,584	236,079	-10	- 6						
Mobile	675,764	685,712	672,506	- 1	+ 1						
Montgomery	409,314	464,322	386,720	-12	+ 6						
Tuscaloosa	133,040	141,018	129,262	- 6	+ 3						
Ft. Lauderdale-Hollywood Jacksonville Miami Orlando Pensacola Tallahassee Tampa-St. Pete. W. Palm Beach											
Albany	132,642	139,921	124,207	- 5	+ 7						
Atlanta	7,959,200	8,860,144	7,708,432	-10	+ 3						
Augusta	348,906	349,627	327,949	- 0	+ 6						
Columbus	294,466	334,155	282,919	-12	+ 4						
Macon	368,535	403,731	332,604	- 9	+11						
Savannah	360,829	401,162	357,495	-10	+ 1						
Baton Rouge Lafayette Lake Charles New Orleans	818,632 185,579 182,210 3,163,482	821,797 183,502 181,423 3,263,373	823,050r 184,699 192,231 2,974,312	- 0 + 1 + 0 - 3	- 0 + 1 - 5 + 6						
Biloxi-Gulfport	165,190	175,372	158,581	- 6	+ 4						
Dothan	848,208	1,002,898	864,755	-15	- 2						
Chattanooga Knoxville Nashville	1,015,360 626,635 1,893,039	967,578 675,991 2,089,748	871,470 586,013 1,897,973	+ 5 - 7 - 9	+17 + 7 - 0						
OTHER CENTERS											
Anniston	82,280	83,962	80,379	- 2	+ 2						
Dothan	99,464	97,772	89,184	+ 2	+12						
Selma	50,022	61,235r	50,983	-18	- 2						
Bartow	42,252	44,734	49,175	- 6	-14						
Bradenton	116,936	112,171	114,391	+ 4	+ 2						
Brevard County	242,944	260,735	269,981	- 7	-10						
Daytona Beach	132,733	117,367	117,082	+13	+13						
Ft. Myers-N. Ft. Myers	167,564	168,481	146,096	- 1	+15						
Gainesville Lakeland Monroe County Ocala St. Augustine Sarasota Tampa Winter Haven	126,089 186,054 49,791 98,079 25,037 625,022 193,117 1,355,608 106,689	142,031 219,125 60,358 106,681 27,576 603,813 199,376 1,324,278 99,139	117,729 190,555 42,867 105,970 27,811 518,958 211,768 1,343,323 106,736	-11 -15 -18 - 8 - 9 + 4 - 3 + 2 + 8	+ 7 - 2 +16 - 7 -10 +20 - 9 + 1 - 0						
Athens Brunswick Dalton Eiberton Gainesville Griffin LaGrange Newnan Rome Valdosta	140,987 62,307 124,563 16,652 85,058 47,302 26,195 28,631 97,017 67,488	165,884 66,985 143,529 20,078 102,292 53,693 25,358 36,248 109,461 75,693	108,258 60,583 112,753 16,749 105,835 44,215 24,036 28,874 96,742 68,774	-15 - 7 -13 -17 -17 -12 + 3 -21 -11 -11	+30 + 3 +10 - 1 -20 + 7 + 9 - 1 + 0 - 2						
Abbeville Alexandria Bunkie Hammond New Iberia Plaquemine Thibodaux	16,175 184,390 8,487 49,728 53,448 17,783 37,948	17,332 178,611 10,471 52,117 50,461 17,469 33,251	18,134 179,255 9,166 44,979 47,715 18,472 35,321	- 7 + 3 -19 - 5 + 6 + 2 +14	-11 + 3 - 7 +11 +12 - 4 + 7						
Hattiesburg Laurel Meridian Natchez Pascagoula Moss Point Vicksburg Yazoo City	82,403 51,614 78,971 41,565 74,914 57,419 35,534	81,821 55,208 82,676 48,739 96,473 64,457 38,601	58,956 55,295 85,509 45,232 79,896 51,457 26,881	+ 1 - 7 - 4 -15 -22 -11 - 8	+41 - 7 - 8 - 8 - 6 +12 +32						
Bristol Johnson City Kingsport	100,248 119,151 170,397	113,427 115,135 200,414	94,967 103,101 172,872	-12 + 3 -15	+ 6 +16 - 1						
District Total	45,911,505	48,572,723r	44,263,517r	- 5	+ 4						
Alabama† Florida‡ Georgia‡ Louisiana** Mississippi†† Tennessee†	4,475,532 15,692,109 12,024,317 5,477,434 1,923,879 5,491,173	5,302,593 16,410,773 13,153,350 5,407,682 2,153,311 5,766,912	5,680,695r 15,232,468 11,485,268 5,286,580r 1,926,278 5,131,878	- 7 - 4 - 9 + 1 -11 - 5	+ 2 + 3 + 5 + 4 - 0 + 7						

*Includes only banks in the Sixth District portion of the state †Partially estimated ‡Estimated r-Revised

District Business Conditions



* Seas. adj. figure; not an index
 Latest plotting: January—except mfg. production and farm receipts, December

The Southeastern economic picture has brightened a bit. Nonfarm employment picked up in January; the gain was fairly evenly shared among different industries and states. Auto sales have strengthened somewhat. However, construction contract dollar volume in January was down from December's unusually high level. The index of farm prices remained depressed. At the banks, weak demand for business loans combined with declining short-term interest rates in February to produce the ninth prime rate cut in less than a year.

Preliminary data indicate that nonfarm employment rose in three of the four reporting District states in January. Only Florida showed employment losses, with the largest declines occurring in transportation, service, and trade employment. Georgia, Louisiana, and Mississippi recorded gains in nonmanufacturing employment. Both manufacturing employment and weekly hours edged upward.

Further interest rate reductions occurred in February. Effective February 13, this Bank lowered its discount rate by $\frac{1}{4}$ percent, which placed the current rate at $4\frac{3}{4}$ percent. In the following week, most District banks announced another $\frac{1}{4}$ -percent reduction in their prime lending rate, bringing the cost of bank credit more in line with other short-term rates. Commercial and industrial loan demand remained weak at the larger banks, while lending involving securities to brokers, dealers, and others advanced through the first part of February. Strong inflows of time and savings deposits at medium- and small-size banks show no signs of letting up.

For the first time in five months, unit auto sales for January passed the year-ago level. In January,

consumers did not make more use of instalment credit at commercial banks. The dollar volume dropped more for extensions of new credit than for repayments. Hence, total consumer credit outstanding declined slightly.

January figures reveal a drop in the dollar volume of both residential and nonresidential construction contract awards. Nevertheless, preliminary data suggest a continuation of large savings inflows at District savings institutions in January, putting further downward pressure on mortgage rates. Many savings and loan associations are building up their liquidity positions substantially and have been buying more mortgages from outside their direct lending areas.

In spite of freezes that damaged the unharvested crop, citrus prices declined further in January. Prices of milk, eggs, hogs, and tobacco joined the downward trend. Broilers, beef cattle, vegetables, and grain crops experienced price increases, however. This offset other price declines and resulted in little net change in the general agricultural price level. Severe winter weather contributed to increased expenditures for livestock feed, reducing profits in the region.

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