

FEDERAL RESERVE BANK OF RICHMOND

MONTHLY REVIEW

*The Full-Employment Budget: A Guide
For Fiscal Policy*

Federal Aid to Fifth District States

Manufacturing in West Virginia



Volume 58
Number 5

MAY 1972

THE FULL-EMPLOYMENT BUDGET: A Guide for Fiscal Policy

The Federal Government's spending and taxing programs exert a major impact on economic activity and hence on employment. But measuring the dimensions of this impact is not a simple task. Raw tax receipts and outlay figures as reported in the official unified budget are not an adequate measure because some Government receipts and some Government disbursements bear no direct relationship to current economic activity.

Refinement of actual budget data is required to isolate the impact of the Government's fiscal operations on current economic activity and employment. Specifically, it is necessary to identify those disbursements and revenues that are related to current production and income and eliminate those that are not. This is the purpose of the national income accounts (NIA) budget.¹ But even this refined budget contains limited information about the direction and magnitude of the Federal budget's effects on the economy. A major difficulty arises from the fact that receipts and outlays as shown in the NIA budget, like those in the unified budget, not only affect but also are affected by changes in the level of economic activity.² To eliminate the influence of changes in the level of economic activity and therefore, to obtain a better measure of the economic impact of discretionary fiscal policy, the full-employment budget has been devised.³

¹ Adjustment of unified budget outlays and receipts to obtain NIA budget figures includes subtraction of Government loans and certain financial transactions from the total unified budget outlay figure. Certain items such as Government payments for employee retirement and Government receipts from business-type transactions are netted to obtain unified budget totals. These amounts that have been netted in the unified budget are added to both unified receipts and outlays to obtain NIA receipts and outlays. Timing adjustments are also made so that certain Government tax receipts reflect the period when income is earned rather than when tax payments are actually made. Timing adjustments are made for defense purchases so that expenditures are recorded to reflect the time of delivery rather than the time of fabrication or payment. For further discussion see *Special Analysis, Budget of the United States Government, Fiscal Year 1973* (Washington, D. C.: U. S. Government Printing Office, 1972), pp. 14-16.

² Actual budget figures are the result of both discretionary fiscal actions and automatic stabilization policies. Discretionary fiscal actions are specific Congressional and Administration decisions to change Government outlays or to change tax laws. On the other hand, automatic stabilization policies produce automatic changes in actual receipts and expenditures when changes in the level of economic activity occur. For example, as personal income increases, tax receipts automatically increase at a more rapid rate due to the progressive income tax rate structure. Such automatic changes in receipts and outlays must be distinguished from discretionary fiscal actions.

³ Estimates of full-employment budget data are calculated by the Government on both the unified budget basis and the NIA basis. Because Government receipt and disbursement figures in the NIA budget are related more directly to current production and income, full-employment data based on the NIA approach are presented in this article.

The full-employment budget takes as its starting point an estimate of what the Federal Government's revenues would be, given existing tax rates, if the economy were operating at full employment. An estimate of government expenditures at full-employment is calculated by subtracting from actual expenditures the amount by which unemployment compensation would decline if the economy were operating at full employment. The difference between full-employment receipts and expenditures, i.e., the full-employment surplus or deficit, is a measure of the direction and strength of the impact of Federal fiscal operations. In particular, the larger the surplus or smaller the deficit, the more restrictive or less expansionary is the economic impact of discretionary fiscal policy. Period-to-period changes in the size of the surplus or deficit are taken as an indication of the size of impact of fiscal policy on the economy. As a guide to fiscal planning, policymakers may select as a target a full-employment surplus or deficit of a certain size.

The assumptions on which full-employment budget estimates are based are determined somewhat arbitrarily. For example, judgment plays a role in the specification of economic conditions that define "full employment." For this and other reasons, the full-employment budget is at best an approximation. Accordingly, the analytical results generated by the use of the full-employment budget are conditioned by the choice of the underlying assumptions. Nevertheless, the concept of the full-employment budget can be a useful tool in formulating and understanding economic policy.

Pitfalls in Budgetary Analysis The combined effect of changes in tax and expenditure policies and changes in the level of economic activity on recorded budget data may be seen by examining the reasons why final budget figures deviate from earlier estimates of receipts and outlays. At the beginning of each calendar year, budgetary estimates are made for the next fiscal year (July 1—June 30), and a revised estimate is presented for the current fiscal year. These estimates are based on existing spending au-

Table I

COMPARISON OF ESTIMATED AND ACTUAL FEDERAL
RECEIPTS AND EXPENDITURES, NIA BASIS

(billions of dollars)

Fiscal Year	Original Estimate			Revised Estimate			Actual		
	Receipts	Ex-penditures	Surplus or Deficit (-)	Receipts	Ex-penditures	Surplus or Deficit (-)	Receipts	Ex-penditures	Surplus or Deficit (-)
1962	NA	NA	NA	105.6	106.1	- 0.5	104.2	106.4	- 2.1
1963	116.3	111.9	4.4	108.8	113.2	- 4.3	110.2	111.4	- 1.2
1964	111.4	119.0	- 7.6	113.6	119.1	- 5.5	115.5	116.9	- 1.4
1965	118.8	121.5	- 2.8	116.0	121.0	- 5.0	120.5	118.5	2.0
1966	121.0	127.0	- 6.0	128.8	131.0	- 2.2	132.8	131.9	0.9
1967	142.2	142.7	- 0.5	149.8	153.6	- 3.8	147.2	154.5	- 7.3
1968	167.1	169.2	- 2.1	161.1	171.1	-10.0	160.6	172.5	- 11.9
1969	182.5	185.0	- 2.5	190.0	187.3	2.7	190.3	185.9	4.4
1970	202.3	199.6	2.7	201.8	198.1	3.6	194.6	197.2	- 2.7
1971	205.4	203.8	1.6	200.0	215.0	-15.0	194.0	212.4	-18.4
1972	225.9	230.1	- 4.2	202.8	237.8	-35.0			
1973	227.9	255.9	-28.0						

Source: U. S. Department of Commerce and Office of Management and Budget.

thorizations, on the Administration's proposed fiscal legislation, and on forecasts of tax revenues and of certain Government expenditures that vary with national income. As shown in Table I, final budget figures usually differ substantially from original budget estimates and even from the revised estimates made halfway through the fiscal year. Major causes of the differences are Congressional departures from Administration programs and inaccurate forecasts of economic conditions.

Similarly, and for much the same reasons, there are usually sizable differences between the original estimates and the revised estimates presented halfway through the fiscal year. Table II shows a detailed comparison of these two estimates for fiscal 1972. The original estimate of receipts for that year was reduced partly as a result of the tax changes provided in the Revenue Act of 1971, and partly as a result of other legislation providing for expenditures not contemplated in the original estimates. In addition, national income growth turned out to be considerably less and unemployment considerably higher than indicated in the economic projections on which revenue estimates were based. Consequently, tax yields fell short of expectations and outlays for unemployment compensation were greater than originally expected. Overall, the shortfall in the level of economic activity helped produce a budget deficit much larger than that originally estimated for fiscal 1972.

Table II

ORIGINAL AND REVISED ESTIMATES
OF RECEIPTS AND EXPENDITURES,
FEDERAL SECTOR, NIA FOR FISCAL 1972

(billions of dollars)

	Original Estimate as of January 1971	Revised Estimate as of January 1972
RECEIPTS		
Personal tax and nontax receipts	99.0	91.3
Corporate profits tax accruals	43.5	33.0
Indirect business tax and nontax accruals	21.8	19.8
Contributions for social insurance	61.6	58.7
Total receipts	<u>225.9</u>	<u>202.8</u>
EXPENDITURES		
Purchases of goods and services	102.2	103.0
Defense	74.0	73.3
Nondefense	28.2	29.7
Transfer payments	75.0	79.8
Domestic	72.5	77.0
Foreign	2.5	2.8
Net interest paid	14.3	13.4
Grants-in-aid to State and local governments	34.4	36.2
Subsidies less current surplus of Government enterprises	4.2	5.4
Total expenditures	<u>230.1</u>	<u>237.8</u>
Deficit	4.2	35.0

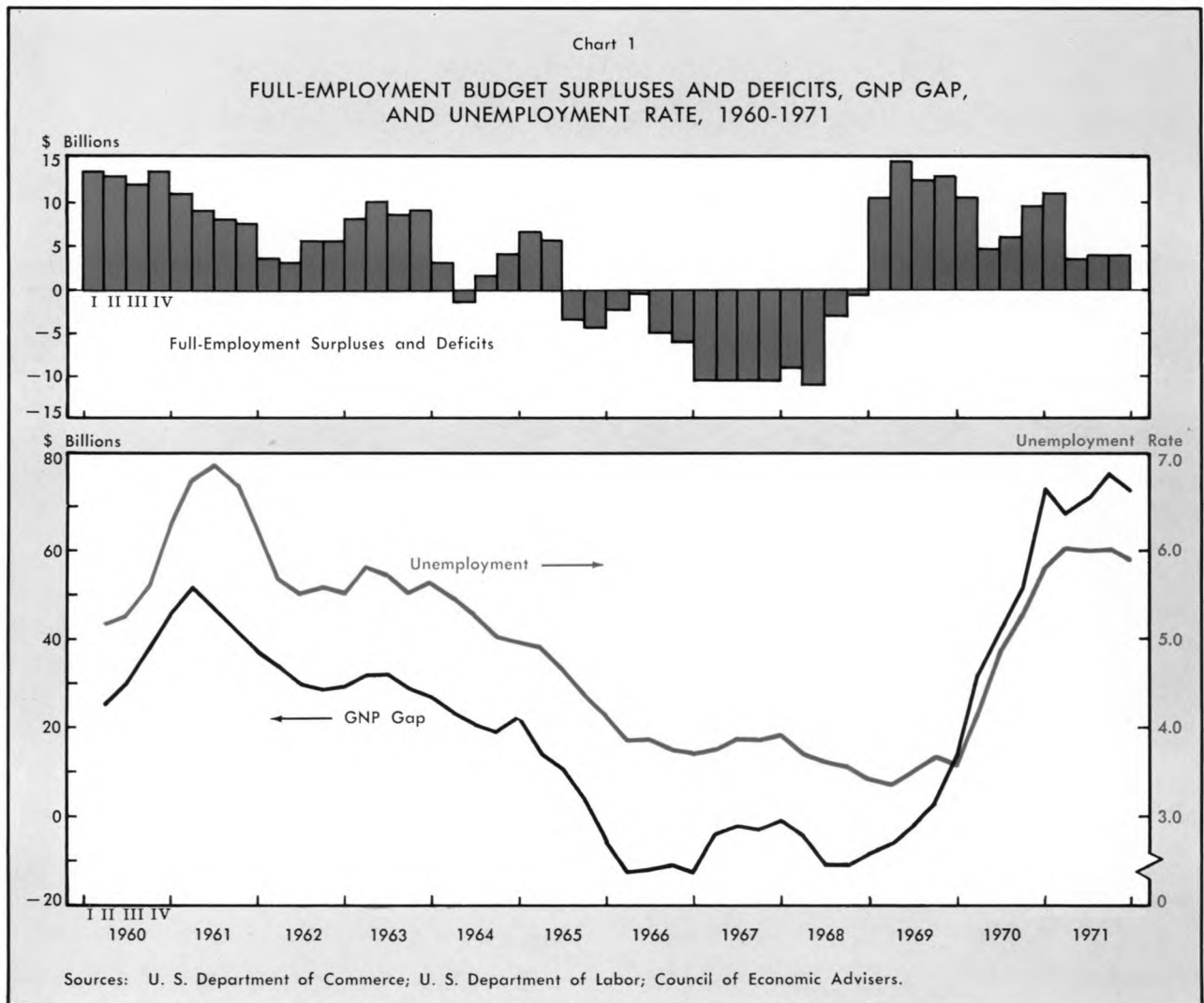
Source: Special Analyses, Budget of the United States Government, Fiscal Year 1972, p. 8 and Special Analyses, Budget of the United States Government, Fiscal Year 1973, p. 8.

Measuring Fiscal Impact Examination of fiscal policy in a full-employment framework is useful in analyzing the reasons why the economy may be operating at a level below its potential and when this is the case, in shaping policies to restore the economy to full employment. An economy operating at less than full capacity signals a deficiency in private demand that may be remedied by appropriate budgetary action.

During the early 1960's, the economy, by rather general agreement, operated well below its capacity level. The difference between actual gross national product (GNP) and potential GNP, the so-called GNP gap, appeared to some observers to be increasing. This is reflected in Chart 1, which is drawn up on the assumption that an unemployment rate of 4.0% corresponds to full employment. In that context, some policy advisers argued that fiscal policy

was excessively restrictive even though recorded budget figures, as shown in Table III, showed deficits.⁴ That is to say, given existing tax rates and expenditure programs, the budget would have shown a surplus if the economy had been operating

⁴ In the 1950's and early 1960's, the administrative budget, the consolidated cash budget, and the national income accounts budget were commonly used to measure fiscal impact. The administrative budget, normally the principal financial plan for the Government, covered receipts and expenditures of funds owned by the Government. It excluded funds held in trust by the Federal Government and showed only net outlays (expenditures less receipts) of public enterprise funds, intragovernmental funds, and reimbursements which by law are mingled with appropriations. The consolidated cash budget reflected transactions between the Government and public and included both funds owned by the Government (Federal funds) and trust funds. Instead of being reported on a checks-issued basis as used in the administrative budget, the cash budget was reported on a checks-paid basis. The unified budget, which replaced the administrative budget and cash budget beginning in fiscal year 1969, includes trust fund activity and is reported on a checks-issued basis. Also, certain intragovernmental transactions such as the employee's share of retirement or social security payment or monthly payments for supplementary medical payment are not netted out in the unified budget. Table III shows actual budget figures based on only the unified budget concept so that the data presented are consistent for interyear comparison. For further discussion of budget relationships, see *Special Analyses, Budget of the United States, Fiscal Year 1969* (Washington, D. C.: U. S. Government Printing Office, 1968), pp. 5-13.



at full employment. To emphasize this point, the Council of Economic Advisers centered much of its *Annual Report* for 1962 around the concept of the full-employment budget. In fact, it was pointed out that not only had full-employment surpluses been common throughout the last half of the 1950's, but they had increased significantly in 1960 and 1961.

During the years 1966 through 1969, full-employment budget figures did not draw the publicity that they had received during the early 1960's. Over this period, the economy operated at or near full capacity and the unemployment rate was generally below 4.0%. In such high-employment periods, figures for the full-employment budget and those shown in other budgetary measures tend to come together, and measurement of budget restrictiveness or stimulation from recorded budget data becomes more reliable. As shown in Table III, the differences between the NIA budget deficits and surpluses and their counterparts in the full-employment budget were relatively small during fiscal years 1966 to 1969.

In 1970, however, the unemployment rate and the GNP gap increased sharply. Again, Federal budget policy was formulated in the full-employment budget framework as noted in the President's *Budget Message* presented in January 1971 and the Council of Economic Adviser's *Annual Report* for 1971.

Measurement of the Full-Employment Budget

The following procedure is used by the Council of Economic Advisers to estimate full-employment budgets. First, the potential (i.e., full-employment) real GNP growth path is projected. Currently, a real growth rate of 4.3%, based on a trend line beginning with the fourth quarter of 1969, is being used.⁵ Next, by applying the actual rate of inflation measured by the GNP price deflator, potential real GNP is converted to current dollar terms. The resulting full-employment income is then distributed into various income components including taxable personal income, corporate profits, and wages and other labor income. The estimates of income components at full employment are based on the distribution pattern that resulted during previous periods of full employment. To obtain full-employment revenues, these full-employment income components are then multiplied by the appropriate average tax rates, which are revised quarterly and are based on most recent tax and income data.

⁵ For a discussion of the CEA's approach, see Michael Levy, *Fiscal Policy, Cycles and Growth*, Studies in Business Economics No. 81 (New York: National Industrial Conference Board, 1963).

Table III

COMPARISON OF SURPLUSES AND DEFICITS, (—) UNIFIED BUDGET, FEDERAL SECTOR, NIA, AND FULL-EMPLOYMENT BUDGET

(billions of dollars)

Fiscal Year	Unified Budget	Federal Sector NIA	Full-Employment Budget NIA	Difference Between NIA and Full-Employment Budget NIA
1960	0.3	3.5	9.8	6.3
1961	- 3.4	- 2.7	11.3	14.0
1962	- 7.1	- 2.1	5.4	7.5
1963	- 4.8	- 1.2	7.3	8.5
1964	- 5.9	- 1.4	4.8	6.2
1965	- 1.6	2.0	4.3	2.3
1966	- 3.8	0.9	- 2.8	3.7
1967	- 8.7	- 7.2	- 8.0	1.0
1968	-25.2	-11.9	-10.2	1.7
1969	- 3.2	4.6	5.4	0.8
1970	- 2.9	0.8	10.1	9.7
1971	-23.0	-18.4	7.5	25.9
1972 (est.) ¹	-38.8	-35.0	- 3.0	32.0
1973 (est.) ¹	-25.5	-28.0	N.A.	N.A.

Sources: U. S. Treasury Department, Office of Management and Budget; U. S. Department of Commerce; Council of Economic Advisers.

¹ Estimates are as of January 1972 and exclude legislation since last Budget Message.

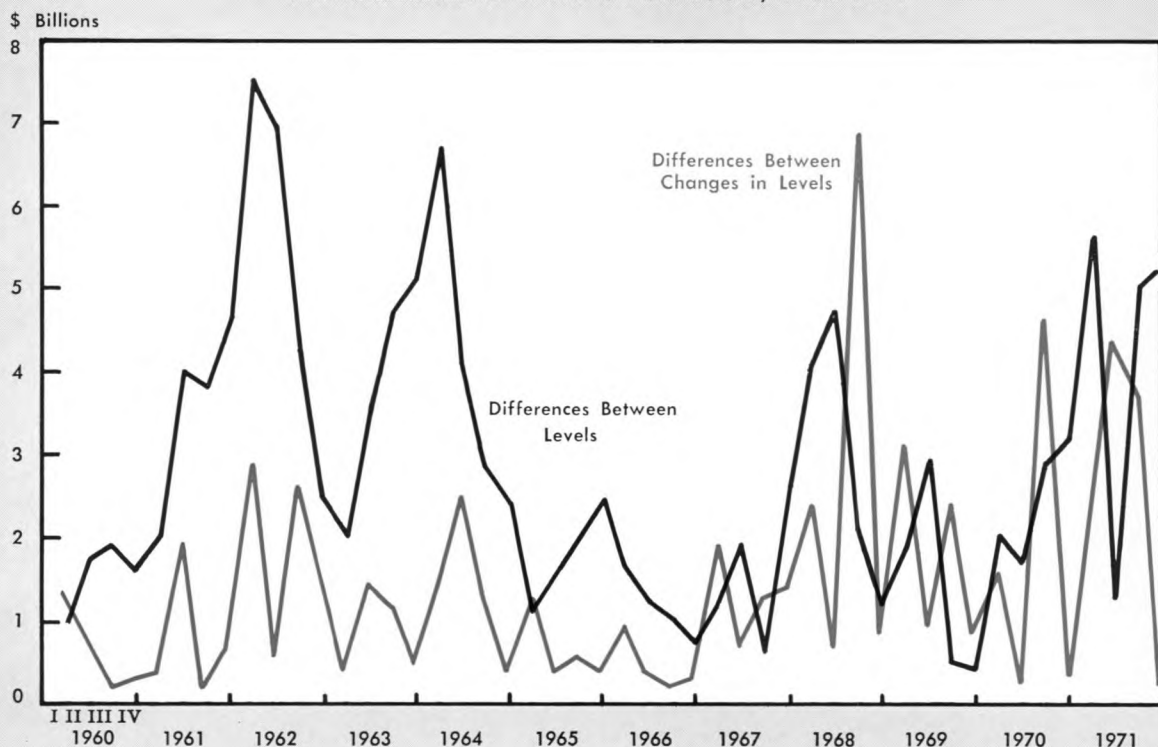
Finally, full-employment expenditures are estimated. This estimate deviates from actual expenditures by the difference between the actual amount of unemployment compensation and the compensation that would be paid if the economy were at full employment.

Limitations and Misuses Although the full-employment budget provides a more meaningful picture of the thrust of fiscal policy than other kinds of budget data, the concept is not without its limitations. Specifically, problems arise in interpreting full-employment budget data because the data reflect something more than changes in fiscal policy. In addition, estimates of levels of budget data by themselves do not provide information sufficient to justify their use as a single measure of the impact of fiscal policy.

Not a Pure Measure of Discretionary Fiscal Policy Changes in estimates of full-employment budget data from one period to another do not necessarily reflect deliberate changes in fiscal policy. For example, changes in full-employment revenue estimates result,

Chart 2

DIFFERENCES BETWEEN LEVELS AND CHANGES IN LEVELS OF FULL-EMPLOYMENT SURPLUSES AND DEFICITS ESTIMATED BY THE CEA AND FEDERAL RESERVE BANK OF ST. LOUIS, 1960-1971



Sources: Federal Reserve Bank of St. Louis; Council of Economic Advisers.

in part, because estimates of average tax rates are revised quarterly. Furthermore, increases in full-employment revenues and full-employment expenditures arise because of economic growth. That is, as potential GNP increases, estimates of full-employment receipts and expenditures will be raised accordingly.

Also estimates of full-employment surpluses or deficits often have to be revised because of unexpected changes in prices. Specifically, estimates of future full-employment GNP and budget revenues are based on the assumption that a "normal" increase in prices will occur. If increases in prices are greater than expected, full employment GNP and revenue estimates will be higher than originally estimated. Such price increases raise tax revenues immediately while their effect on the cost of government purchases is slower. Hence, the resulting full-employment budget may appear more restrictive than

earlier estimates suggested. Since the Council of Economic Advisers assumes in its estimates a continuation of the recent rate of change in the GNP deflator, a change in the rate of inflation will affect its estimates.⁶ Therefore, changes in full-employment budget estimates do not necessarily mean that there has been a change in discretionary fiscal policy.

Shortcomings of Estimates of Levels Because different basic economic assumptions may lead to significantly different estimates of budget deficits and surpluses, the reliability of budget estimates depends on the realism of the underlying assumptions.⁷ For comparison, differences in the estimates made by the Council of Economic Advisers and estimates

⁶ For further discussion see Arthur Okun and Nancy Teeters, "The Full-Employment Surplus Revisited," in *Brookings Papers on Economic Activity*, 1 (Washington, D. C.: The Brookings Institution, 1970), pp. 77-116.

⁷ Analysis of different estimates are found in Levy, *op. cit.*, Chapter 6 and Nancy Teeters, "Estimates of the Full-Employment Surplus, 1955-1964," *Review of Economics and Statistics*, 47 (August 1965), 309-321.

compiled by the Federal Reserve Bank of St. Louis are presented in Chart 2.⁸ When different estimates for the same time period differ significantly, the problem of correct interpretation of a given budget arises.

In addition, full-employment budget estimates that are based on incorrect assumptions may induce policymakers to take fiscal action that would lead to undesired results. For example, overestimation of potential output of the economy could lead to an excessively stimulative fiscal policy that might increase aggregate demand to such a level that inflation would result.⁹

Even when different estimates of the level of budget deficits and surpluses for the same time period are similar, a problem of interpretation of these budget data still remains. In particular, the change in the budget deficit or surplus from one

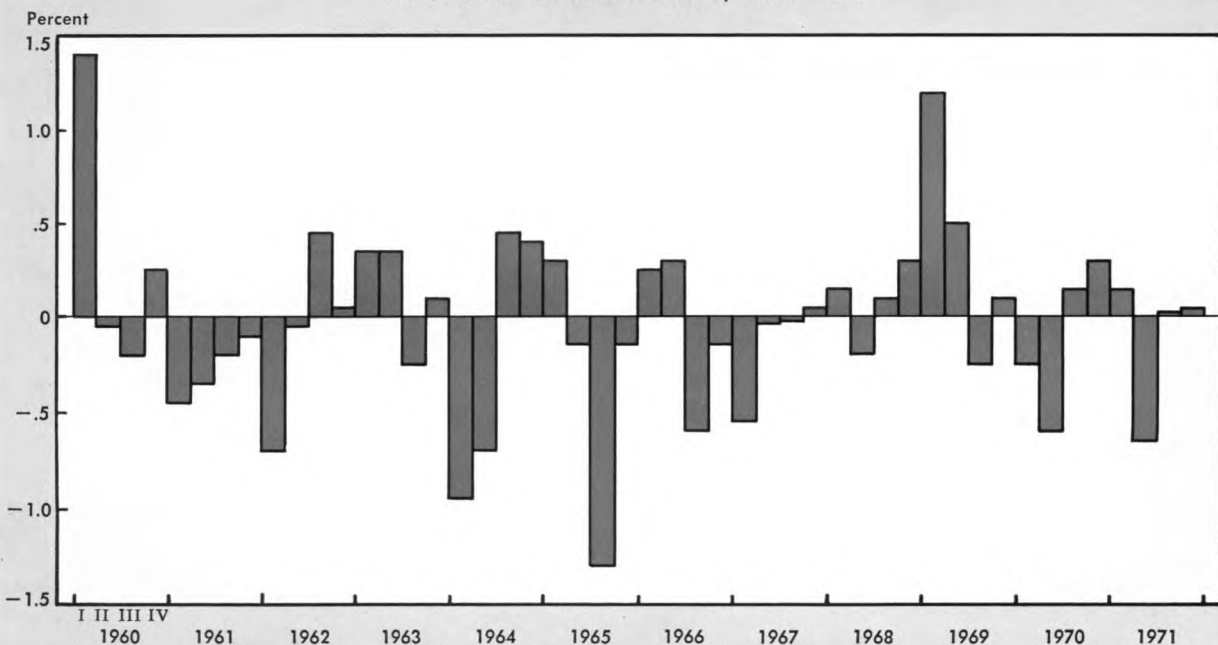
time period to another is a better measure of the direction and thrust of discretionary fiscal action than the absolute size of the deficit or surplus. For example, a budget deficit of \$5 billion may or may not indicate an expansionary program. But if last year's deficit was \$20 billion, a \$5 billion deficit this year clearly represents a significantly less expansive fiscal policy posture. The differences in the quarterly changes as estimated by the St. Louis Federal Reserve Bank and those offered by the Council of Economic Advisers are generally smaller than differences in the levels. Also, the direction of change is the same in 37 of the 48 quarters examined.

Another factor to consider is that the expansionary or restrictive effect of a given change in the surplus or deficit varies with the level of economic activity. That is, as the economy grows, the relative importance of a given change will diminish. Therefore, it is often useful to work with full-employment budget deficit or surplus estimates taken as a percentage of full-employment GNP, as shown in Chart 3. Changes in this fraction may reflect the impact of shifts in fiscal policy more accurately than

⁸ The Federal Reserve Bank of St. Louis releases its own quarterly estimates of full-employment data in "Federal Budget Trends" and each fall publishes revised estimates in "Technical Notes for Estimates of the High-Employment Budget."

⁹ For a critique of the concept of potential output see William Fellner, *Case for Moderation in the Recovery of 1971, An Analysis Based on Observed Wage-Price-Productivity Relations* (Washington, D. C.: American Enterprise Institute, 1971), pp. 29-31.

Chart 3
 QUARTERLY CHANGES IN FULL-EMPLOYMENT BUDGET
 DIVIDED BY POTENTIAL GNP, 1960-1971



Source: Council of Economic Advisers.

absolute changes in the numbers. Even so, there are no unequivocal standards for determining what percentage changes are significant or insignificant.

Further Analysis Necessary If one uses changes in the size of budget surpluses or deficits, even when these are expressed as a percentage of potential GNP, he is assuming that all fiscal activity has the same quantitative impact on economic activity. In other words, an increase in expenditures of \$1 billion would be expected to have the same influence on the level of activity as a tax cut that would reduce revenues by \$1 billion. But not all sectors of the economy react similarly to different fiscal actions, nor does a specific sector necessarily react the same way under different conditions. Therefore, to measure fiscal impact more accurately, specific actions should be weighted according to their stimulative or restrictive influence.¹⁰

Full-employment data do not reveal the timing of fiscal impact. On occasion, announcement of a particular program may stimulate business spending long before actual expenditures are recorded. Also, the economic impact of any fiscal change will depend to an important extent upon the posture of monetary policy at the time the action is taken. The easier the

monetary policy, the more expansionary or less restrictive would be a given fiscal program.

Conclusion Frequently, recorded budget data have been used to measure the economic impact of fiscal policy. These data are influenced not only by changes in fiscal policy, however, but also by changes in the level of economic activity. Therefore, the full-employment budget concept is used to provide a more accurate, though still approximate, measure of discretionary fiscal impact by isolating the effect of fiscal policy from the influence of changes in the level of economic activity on budget data.

Problems of interpretation of *levels* of full-employment surpluses and deficits have arisen, however. Therefore, *changes* in these levels relative to potential GNP are regarded as a more accurate measure of the impact of fiscal policy.

Full-employment budget data are still of limited reliability as a measure of fiscal impact, however, because of weighting and timing problems. The full-employment budget was not designed as a single measure of fiscal impact or as a substitute for economic models to be used to investigate timing and weighting problems. Nevertheless, the full-employment budget is a better indicator of the direction of discretionary fiscal action than other kinds of budget data, and it provides an analytical framework in which fiscal decisions that otherwise might be politically unacceptable may be publicly conveyed.

James R. McCabe

¹⁰ To obtain a "weighted" full-employment surplus or deficit, each category of expenditures and receipts is weighted according to its expected economic impact. For example, public expenditures may receive a weight of 1, transfer payments 0.9, personal income taxes -0.9, and corporate income taxes -0.8. The dollar estimates of each category of expenditures and receipts are then multiplied by the respective weights. The sum of these products equals the "weighted" full-employment surplus or deficit.

FEDERAL AID TO FIFTH DISTRICT STATES

The Federal grant-in-aid is an important device for financial cooperation between the Federal and State governments and the dominant type of inter-governmental transfer of funds. Categorical grants-in-aid by the Federal Government to states are made under specific conditions and for specific programs to be implemented at the state level, usually with state financial participation. The purpose of these grants is to encourage programs in which a strong national interest exists. This article reviews the role of Federal grants-in-aid programs in the states of the Fifth District.

Types and Amount of Aid There are many types of Federal grants-in-aid, but they may be classified into the following broad categories: education, highways, public welfare, health and hospitals, employment security administration, and other. Public welfare, highways, and education are by far the largest categories of grants, accounting for more than 88.0% of the total in both the United States and District states. All categories of aid have risen sharply over the past decade with the total in 1970 amounting to \$19.3 billion, up nearly 14.0% over 1969 and 201.0% higher than in 1960.

Federal grants to District states in 1970 totaled \$1.4 billion, about twice the 1960 level and approximately 12.0% more than in 1969. All categories contributed to the general rise, with percentage increases between 1960 and 1970 ranging

from 150.0% for employment security administration to 764.0% for education.

Federal Aid as a Proportion of Total General Revenue In 1970 Federal aid accounted for 22.0% of the total general revenue of state govern-

Table 1

FEDERAL AID TO STATE GOVERNMENTS
AS A PROPORTION OF TOTAL GENERAL REVENUE
1960 AND 1970

State	1960	1970
Maryland	13.4	18.3
Virginia	21.4	21.4
West Virginia	29.6	35.8
North Carolina	22.2	21.1
South Carolina	23.9	23.0
Fifth District	21.5	22.0
United States	23.3	24.8

Source: U. S. Bureau of the Census, *State Government Finance in 1960 and 1970*.

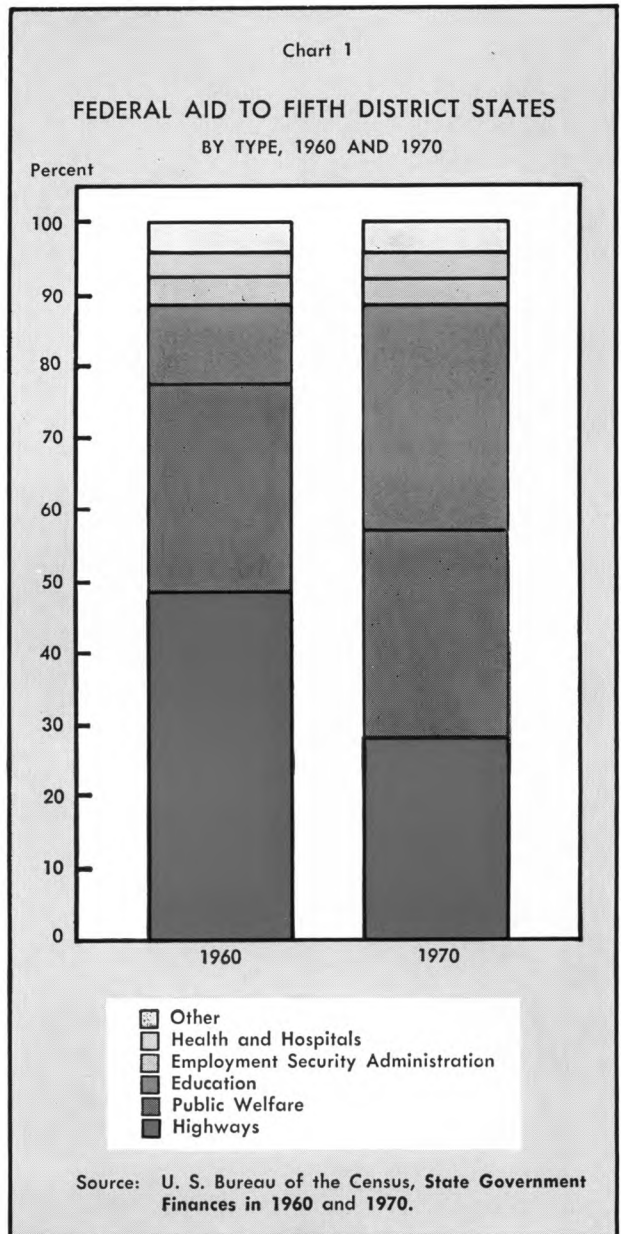


Table II

PER CAPITA FEDERAL AID TO DISTRICT STATES

1960						
State	Education	Highways	Public Welfare	Health and Hospital	Employment Security Administration	Total ¹
Maryland	\$ 2.69	\$ 8.43	\$ 5.54	\$ 0.49	\$ 1.81	\$ 19.62
Virginia	3.26	14.94	4.42	0.99	0.72	25.24
West Virginia	3.40	22.20	15.22	1.00	1.43	44.90
North Carolina	4.00	12.75	14.26	1.46	1.31	32.63
South Carolina	2.85	19.41	9.22	1.31	1.41	35.89
United States	4.07	16.15	11.47	0.74	1.78	35.74
1970						
Maryland	21.10	15.38	28.44	1.90	3.38	72.39
Virginia	22.60	23.83	15.93	2.26	2.32	70.54
West Virginia	31.68	68.50	31.51	3.72	3.36	145.79
North Carolina	26.53	15.02	23.68	2.55	2.55	73.32
South Carolina	29.46	12.79	20.84	4.02	3.03	74.61
United States	22.50	21.89	38.62	2.51	3.80	95.11

¹ Including amounts for categories not shown separately.

Source: U. S. Bureau of the Census, *State Government Finances in 1960 and 1970*.

ments in the Fifth District, compared to approximately 25.0% for the nation as a whole. The range of this fraction for Fifth District states ran from 18.3% in Maryland to 35.8% in West Virginia. In the 1960's, Federal aid as a proportion of total general revenue, shown in Table I, declined or remained constant in Virginia and the Carolinas and increased in Maryland and West Virginia.

Because of population differences, state comparisons are more aptly made with per capita data, shown in Table II. In 1960, total aid per capita in West Virginia and South Carolina exceeded per capita aid for the nation as a whole. West Virginia received the largest per capita grants of any District state in both 1960 and 1970 and ranked eighth nationally in 1970. On a per capita basis, Virginia received less aid than any other Fifth District state in 1970 and ranked 46th among all states.

The Composition of Aid Along with the general increase in Federal grants has come a notable change in the composition of such aid. This can be seen from the data plotted in Chart 1. In 1960, Federal aid for highways and public assistance accounted for 77.3% of all Federal aid received by District states. In 1970, this fraction had dropped to 56.9%.

The completion of much of the interstate highway system in District states accounted for most of this shift. In fact, aid for highways as a proportion of total aid declined from 48.7% in 1960 to 27.9% in 1970. As a fraction of the total, aid for public welfare remained relatively constant at 29.0% over this period.

On the other hand, aid to District states for education rose sharply during the decade of the 60's. This category accounted for 31.7% of total aid in 1970 compared to 11.0% in 1960. As a proportion of total aid received, aid for education ranged from 21.7% in West Virginia to 39.5% in South Carolina. Nationally, this fraction was 23.7% in 1970. On a per capita basis the increase was dramatic in all District states between 1960 and 1970 (Table II). In 1960, per capita aid for education in each District state was less than the national average, and North Carolina ranked first among District states in per capita aid to education. By 1970, per capita aid to education in all District states except Maryland exceeded the national rate, and West Virginia received the highest per capita aid of any District state.

Per capita aid for highways in 1970 ranged from a low of \$12.79 in South Carolina to a high of \$68.50 in West Virginia. Only Alaska, Montana,

Table III

FEDERAL AID AS A PROPORTION OF EXPENDITURES BY CATEGORY
FOR UNITED STATES AND FIFTH DISTRICT STATES 1960 AND 1970

State	Education		Highways		Public	Welfare	Total	
	1960	1970	1960	1970	1960	1970	1960	1970
Maryland	7.0	16.2	21.5	24.1	62.9	53.5	14.1	19.3
Virginia	8.2	15.6	46.9	30.8	67.6	64.6	22.0	21.7
West Virginia	6.4	18.1	46.4	50.9	71.9	68.0	30.2	33.1
North Carolina	6.9	13.5	42.8	25.7	87.2	73.6	24.6	21.2
South Carolina	6.1	18.3	50.9	24.5	72.8	76.1	27.1	22.7
Fifth District	7.0	16.2	41.0	35.6	75.1	64.6	23.0	22.5
United States	8.2	14.7	39.4	32.9	55.3	59.2	23.4	24.8

Source: U. S. Bureau of the Census, *State Government Finances in 1960 and 1970*.

and Wyoming received higher per capita highway grants than West Virginia, and only Florida and Wisconsin received lower per capita grants than South Carolina. Between 1960 and 1970, per capita aid for highways increased in all District states except South Carolina. In terms of per capita highway aid, South Carolina moved from second place among District states in 1960 to fifth place in 1970.

Per capita public welfare aid increased in all District states between 1960 and 1970. West Virginia received the largest per capita aid for this purpose in both years. Maryland, which ranked fifth among District states in 1960, moved to second place by 1970. Per capita welfare aid in all District states was considerably less than the national average.

Aid as a Proportion of State Expenditures A large proportion of state expenditures for education, highways, and public welfare is financed by Federal grants. Such aid is especially significant in the financing of state welfare expenditures. In 1970, the fraction of welfare outlays paid for by Federal grants ranged from 53.5% in Maryland to 76.1% in South

Carolina. In general, District states receive a higher percentage of their welfare expenditures from the Federal government than do all states taken as a whole. In 1970, Maryland was the only District state for which welfare aid as a proportion of welfare expenditures was lower than the average for the 50 states.

Aid for highways accounted for 35.6% of expenditures for highways by Fifth District states in 1970. The comparable fraction for 1960 was 41.0%. West Virginia and Maryland were the only District states in which Federal aid as a proportion of highway expenditures increased over this period.

The most marked change between 1960 and 1970 occurred in the fraction of expenditures on education financed by Federal aid. Over this period, aid as a proportion of total education expenditures almost doubled for every state except West Virginia, where it increased threefold. In 1970, this fraction ranged from 13.5% in North Carolina to 18.3% in South Carolina. It exceeded the national average in every District state except North Carolina.

Thomas E. Snider



MANUFACTURING IN WEST VIRGINIA

The economy of West Virginia, once dominated by the bituminous coal industry, now depends to a large extent on the manufacturing sector. In 1970 total wage and salary disbursements originating in the state's manufacturing industries were more than double those of the state's entire mining industry. Value added by manufacture rose from less than \$1.3 billion in 1958 to almost \$2.2 billion in 1967, an increase of roughly 70.0%. In contrast, the value of annual bituminous coal production increased by only about 26.0% over the same period.

Although the total number of manufacturing establishments in West Virginia declined from 1,916

to 1,844 over the period 1958 to 1967, total employment within this sector increased by 9.0% for the same period. In 1969 manufacturing employed 13,100 West Virginia workers, or 25.6% of all non-agricultural employees in the state. No other sector of the state's economy accounted for as large a fraction of total nonagricultural employment.

A further indication of the growth of manufacturing in West Virginia is the increase in the total employees' payroll in manufacturing, which climbed from \$573.8 million in 1958 to \$831.6 million in 1967, a 45.0% increment. Increases in both the number of employees and the average hourly earnings of employees accounted for this gain.

Manufacturing Industries Value added by manufacture, which is the net increase in value attributable to the manufacturing stage of a product's production, rose by 71.0% from 1958 to 1967, with most industries sharing in the growth. The largest percentage increases were registered by the printing and publishing, and apparel industries, which had 168.5% and 134.1% increases, respectively. As shown in Table II, chemicals, lumber and wood, paper, and leather products also recorded above average gains for the period.

The major manufacturing industries in West Virginia are chemicals; primary metals; and stone, clay, and glass products. Combined, these industries accounted for 53.0% of the employees and 71.8% of value added in manufacturing in 1967. Although each employed an approximately equal number of workers, the chemical industry contributed the largest share to value added with 38.5% of the total, compared with primary metals' 22.5%, and stone, clay, and glass products' 10.8%.

The relative importance of the chemical industry explains a unique characteristic of West Virginia manufacturing. Although durables and nondurables generate approximately equal shares of value added,

Table I

MANUFACTURING IN WEST VIRGINIA 1967

Industry	Employees		Value Added	
	Number Thous.	Percent of Total	Amount (\$ Millions)	Percent of Total
Textile Mill Products	1.4	1.1	9.4	0.4
Food and Kindred Products	6.8	5.5	87.9	4.1
Apparel and Related Products	5.4	4.4	28.8	1.3
Lumber and Wood Products	5.9	4.8	44.6	2.1
Chemicals and Allied Products	22.5	18.1	836.3	38.5
Paper and Allied Products	1.5	1.2	17.1	0.8
Printing and Publishing	4.0	3.2	67.4	3.1
Leather and Leather Products	1.2	1.0	10.0	0.5
Stone, Clay, and Glass Products	20.0	16.1	235.3	10.8
Primary Metals Industries	23.3	18.8	488.2	22.5
Fabricated Metal Products	7.1	5.7	92.6	4.3
Administrative and Auxiliary	3.2	2.6
Other	21.7	17.5	251.9	11.6
Total	124.0	100.0	2,169.5	100.0

Source: U. S. Department of Commerce, *Census of Manufactures*.

Table II

VALUE ADDED BY MANUFACTURE
West Virginia 1958 and 1967

Industry	Value Added (\$ Millions)		Percent Change	Percent of Total	
	1958	1967		1958	1967
Chemical and Allied Products	451.7	836.3	85.1	35.6	38.5
Primary Metals	323.8	488.2	50.8	25.5	22.5
Stone, Clay, and Glass Products	156.6	235.3	50.3	12.4	10.8
Fabricated Metals	60.0	92.6	54.3	4.7	4.3
Food and Kindred Products	68.7	87.9	27.9	5.4	4.1
Lumber and Wood Products	21.9	44.6	103.7	1.7	2.1
Printing and Publishing	25.1	67.4	168.5	2.0	3.1
Paper and Allied Products	9.9	17.1	72.7	0.8	0.8
Apparel and Related Products	12.3	28.8	134.1	1.0	1.3
Textile Mill Products	9.4	9.4	0.0	0.7	0.4
Leather and Leather Products	5.1	10.0	96.1	0.4	0.5
Other	124.3	251.9	102.7	9.8	11.6
Total	1,268.8	2,169.5	71.0	100.0	100.0

Source: U. S. Department of Commerce, *Census of Manufactures*.

urable goods producers employ approximately one and a half times as many workers. This disparity is a result of the capital-intensive chemical industry's high rate of value added per worker.

The West Virginia chemical industry, which ranked tenth among the 50 states in value added by chemical production in 1967, has nearly three-fourths of its output accounted for by the production of industrial chemicals. The major portion of the state's primary metals industry's production is attributable to basic steel producing firms. Flat glass and glassware producers contribute the largest share of value added in the stone, clay, and glass products industry.

Geographical Concentration West Virginia manufacturing firms are situated primarily in counties along the Ohio River, the state's western border, and counties along the Kanawha River. The heaviest concentration appears in the metropolitan areas of Charleston, Huntington, and the northern panhandle. In 1967 over one-half of the employees and value added in manufacturing were accounted for by manufacturers located in these metropolitan areas.

The Charleston area, which contributed over one-fourth of the total value added by manufacture in 1967, is predominantly a chemical-producing region. In the other two areas, establishments in the primary metals industry are the leading contributors to value added and employment; chemicals are also significant but of somewhat lesser importance.

Between 1958 and 1967 the concentration of manufacturing in the Charleston, Huntington, and northern panhandle areas declined slightly. In 1958 these areas accounted for 56.2% of the employees and 65.6% of value added in West Virginia's manufacturing sector. By 1967 these figures had fallen to 52.8% and 56.7%, respectively. The cities of Parkersburg, Fairmont, and Bluefield, with their surrounding counties, have been increasing in importance during the past several years.

Size of Establishments The state's manufacturing sector is composed primarily of small firms. In 1967 nearly one-half of the manufacturing establishments employed fewer than five workers, and over 80.0% employed fewer than 50. Only 6.0% employed more than 250. Lumber and wood, printing and publishing, food products, and machinery are the major industry groups that contain a preponderance of small firms. The largest establish-

ments are generally found in the chemical, glass, and primary metals industries.

Little change has occurred in the size structure in recent years. Between 1958 and 1967 several new, large plants were built in the chemical and primary metals industries, but these were balanced by an increase in the number of smaller establishments, especially within the lumber industry.

Investment in Manufacturing In recent years the chemical industry has been the leader in new capital expenditures within West Virginia manufacturing. Annual investment in this industry consistently exceeds all others, often accounting for more than one-half of the total investment in manufacturing. The most recent *Census of Manufactures*, compiled for 1967, placed new capital expenditures in the state at \$269.0 million for the year, with 55.0% originating in the chemical industry. The primary metals industry ordinarily generates the next largest share, accounting for 25.0% in 1967. The stone, clay, and glass; electrical machinery; printing and publishing; fabricated metals; and food industries invest moderate amounts annually; but the bulk of new capital expenditures of West Virginia manufacturing

Table III

NEW CAPITAL EXPENDITURES IN MANUFACTURING
West Virginia, 1958 and 1967

Industry	New Capital Expenditures (\$ Millions)		Percent of Total	
	1958	1967	1958	1967
Chemicals and Allied Products	78.2	148.4	46.8	55.2
Primary Metals Industries	61.3	67.6	36.7	25.1
Stone, Clay, and Glass Products	6.9	13.4	4.1	5.0
Electrical Equipment and Supplies	1.8	9.4	1.1	3.5
Printing and Publishing	2.6	6.4	1.5	2.4
Fabricated Metal Products	4.4	6.2	2.6	2.3
Food and Kindred Products	5.0	5.3	3.0	2.0
Lumber and Wood Products	2.7	3.8	1.6	1.4
Machinery, Except Electrical	1.0	2.9	0.6	1.1
Other	3.3	5.6	2.0	2.0
Total	167.2	269.0	100.0	100.0

Source: U. S. Department of Commerce, *Census of Manufactures*.

is attributable to the chemical and primary metals industries.

Hourly Earnings in Manufacturing The average hourly earnings of production workers on manufacturing payrolls in West Virginia were above the national average for every year during the 1960's, but by the end of the decade the gap between the two had narrowed until they were practically equal. The national average was \$3.19, and the West Virginia average was \$3.20 in 1969. Nevertheless, West

Virginia continued to lead all other southeastern states by a substantial margin in this particular category.

The highest average hourly earnings in West Virginia manufacturing are paid in the primary metals industry. In 1969 the figure in this industry was \$4.12. The chemicals industry in recent years has ranked second, with an average of \$3.77 in 1969. Average hourly earnings increased at a moderate rate in all West Virginia manufacturing industries during the 1960's, with the state average rising 32.8% between 1960 and 1969. By comparison, the national average gained 41.2% over the same period.

Summary Historically dominated by the coal industry, the economic base of West Virginia has been broadened over the past two decades by the growth of the manufacturing sector. This growth, which has been fostered by the state's abundance of power sources and raw materials, has established manufacturing as the leading industry in West Virginia and has provided the state with a more diversified economic structure. While the coal industry continues to play an important role, it is no longer the predominant factor in the state's economy.

Thomas Y. Coleman

This is the first in a series of articles on the economic and financial characteristics of Fifth District states.

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