ENERGY DEPENDENCE AND SOUTHEASTERN ECONOMIC GROWTH: AN INPUT-OUTPUT ANALYSIS

by James T. Fergus

This past winter's brush with energy shortages heightened our awareness of the central role played by energy supplies in economic growth. Recent proposals to curtail energy consumption are likely to be passed by Congress in the relatively near future (see Box 1). Suggested energy-saving measures have generally included raising the price of fuels in shortest supply (petroleum and natural gas) and providing incentives to use alternative fuels, particularly coal. How seriously *would* increased energy costs affect the Southeast?[1] Would prices of some goods and services produced in the Southeast rise relative to those provided by other regions? Would substitutes displace some of its products, dampening the region's rate of economic progress?

One cannot claim to present definitive answers to these questions because of the limited information presently available and the uncertainties surrounding key aspects of future energy developments. This analysis takes an initial step toward understanding the regional impact of energy price increases. First, the major U. S. industries which are heavy energy users are identified. Next, an examination of the relative importance of these industries in the Southeast suggests that the region may be somewhat more vulnerable to energy cost increases than the country as a whole because our region's industries are more dependent on petroleum and natural gas and less dependent on coal. A final section sketches implications for southeastern economic growth and outlines various uncertainties.

[1]The Southeast is defined as those states contained either wholly or partially within the Sixth Federal Reserve District—Alabama, Florida, Georgia, Louisiana, Mississippi, and Tennessee.

ENERGY DEPENDENCE IN MAJOR ECONOMIC SECTORS

Table 1 and Chart 1 show the pattern of energy usage by major economic sectors. The lower panel in Chart 1 pictures, for seven major sectors (industries) of the U. S. economy, the total cost of energy inputs expressed in cents per dollar of industry output. Energy costs relative to production value are greatest in the mining, excluding fuels, sector, followed by nondurable goods manufacturing and agriculture. Durable goods manufacturing and the combined transportation and trade category consume relatively less energy. The construction and services sectors have the lowest energy cost components.

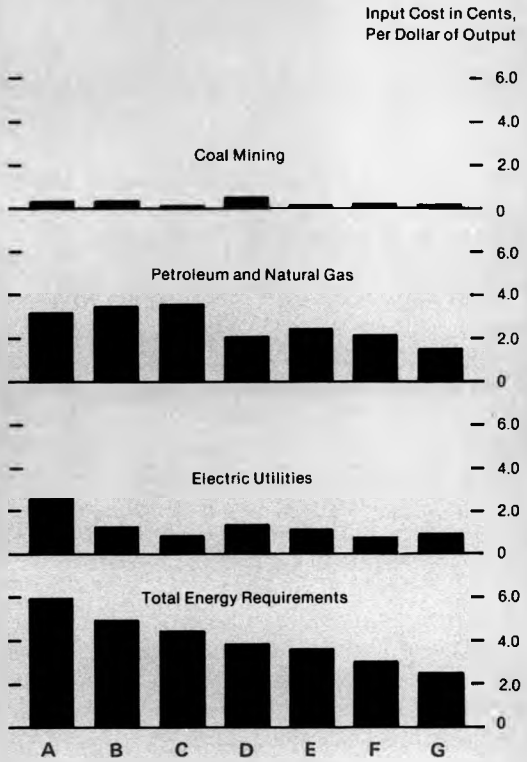
Industries' use of each of the major categories of fuels exhibits the same general pattern. Agriculture, nondurables manufacturing, and nonfuel mining are the most intensive users of petroleum and natural gas. Transportation and trade, durables manufacturing, and construction are moderate consumers of these fuels; the services sector again has the lowest cost component. The pattern differs somewhat for coal use, with durable goods manufacturing leading in consumption. Agriculture falls into the low-use category for coal inputs, accompanied by construction, transportation and trade, and services. Nondurable goods manufacturing and mining, excluding fuels, rely moderately on coal.

Electricity is consumed most vigorously by the mining sector, followed by the two manufacturing sectors and transportation and trade businesses. Services, agriculture, and construction require a relatively low volume of electricity.

In the following section, these energy input cost measures will be used to assess

CHART 1

ADJUSTED DIRECT AND INDIRECT REQUIREMENTS FOR ENERGY INPUTS, UNITED STATES, 1967



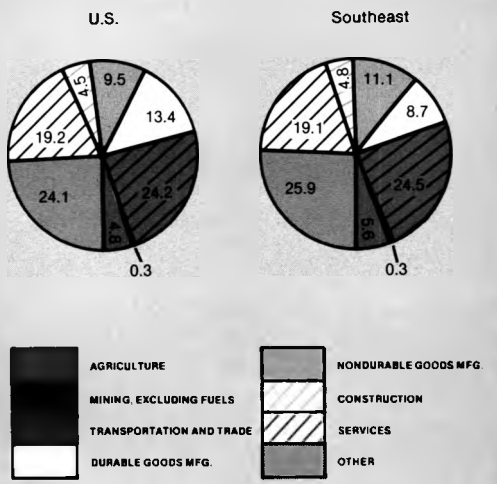
A. Mining, excluding fuels
B. Nondurable Goods Manufacturing
C. Agriculture
D. Durable Goods Manufacturing
E. Transportation and Trade
F. Construction
G. Services

SOURCE: Computed from data contained in "The input-Output Study of the U.S. Economy, 1967: Energy Model." See Technical Note for explanation of adjustment procedure.

energy dependence in southeastern states. Under ideal conditions, one would use energy input measures specific to the region under study. Regional energy measures would reflect differences from the national average in the processes and efficiency of industries in the region. However, lacking sufficiently precise, closely comparable state data, the national information has been used (see Box 2 for a description of the nature, source, and limitations of the data).

CHART 2

EMPLOYMENT SHARES OF MAJOR ECONOMIC SECTORS: U.S. AND SOUTHEAST



SOURCE: Computed from data contained in **Employment and Earnings**, U.S. Department of Labor.

REGIONAL ENERGY DEPENDENCE

Assessment of the regional impact of energy price changes requires a device which relates national energy use data to the economic structure of the region. One significant measure of an industry's importance is the share of regional employment it provides.[2] Table 2 and Chart 2 present the shares of total employment represented by the major economic sectors in the U. S. and the southeastern states. Combining information previously presented about sectoral energy requirements with the measures of their significance in each geographical area provided by these employment shares, we can form some tentative impressions of relative energy dependence.

Petroleum and Natural Gas Energy. The emerging outlines of a national energy policy suggest that users of oil and natural gas will face more rapidly rising costs.

[2]Employment is one of several standards which could be used to assess the relative importance of economic sectors. Alternative, possibly preferable, measures include value added, wage and salary payments, and physical output. Employment has been used in this study because it is a basic determinant of regional economic activity and because recent, reasonably comparable data are available by industry and geographic division.

Thus, a key factor in evaluating the potential impact of energy costs is the degree to which major industries depend on these fuels.

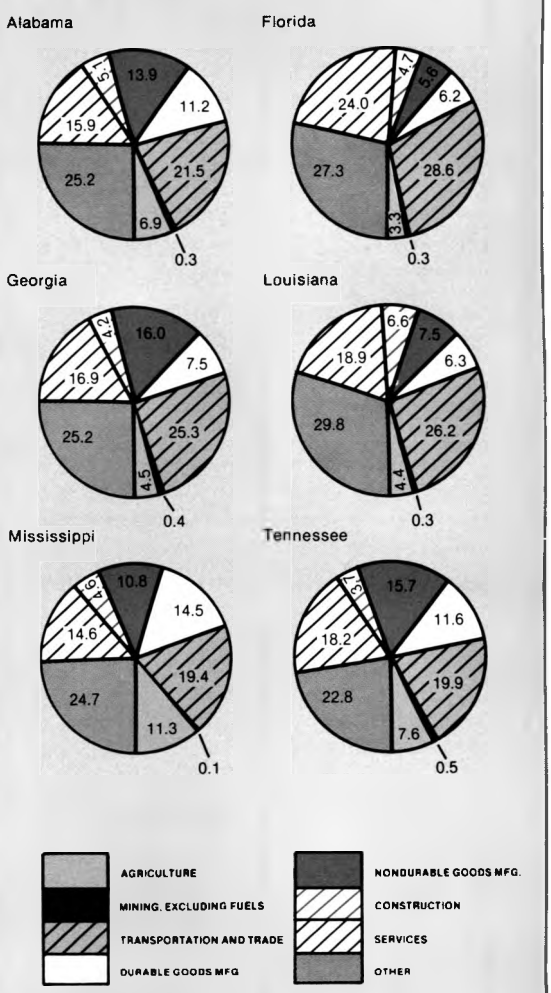
Chart 1 showed relatively high reliance on petroleum and natural gas inputs in the agricultural, nonfuel mining, and nondurable goods manufacturing sectors. There is little difference among geographic areas in mining's share of employment. But for both agriculture and nondurable goods manufacturing, the employment share in the Southeast is appreciably greater. This provides an initial hint that this region may be subject to a greater degree to energy-induced cost increases. The remaining major difference in employment shares reinforces this interpretation, since durable goods manufacturers, moderate users of petroleum and natural gas, are a much less important source of employment in the Southeast than nationally. To the extent that employment concentration in petroleum- and natural gas-intensive industries is greater in the Southeast and its share of moderate-user industries is lower, the region is more vulnerable to energy-induced cost increases.

Within the District states, Florida's position appears most advantageous at first glance (Chart 3). Its employment shares in both agriculture and nondurable goods manufacturing are the lowest of the six states, while its share is greatest in the services sector, the industry least hungry for petroleum and natural gas inputs. However, a sizable part of Florida's service business is tourism-related. Although the cost structures of these businesses may not be greatly affected by energy cost increases, the volume of their tourist business could easily be eroded by higher costs of auto and air transportation. The transportation and trade industries, which account for a relatively large proportion of Florida employment because of the importance of tourism,[3] will be affected even more directly.

Louisiana's economy, like Florida's, has important services, transportation, and trade industries, portions of which are also dependent on tourism. This state would probably experience similar effects from changing energy costs. It also has the highest concentration of employment in contract construction, another light consumer of petroleum and natural gas. Of course, Louisiana enjoys another great advantage—its position as a major energy-producing and processing state.

CHART 3

EMPLOYMENT SHARES OF MAJOR ECONOMIC SECTORS: SIX SOUTHEASTERN STATES



SOURCE: Computed from data contained in employment releases from individual state labor departments.

[3]In economic terminology, transportation is a "complementary good" to trade and services because they are consumed together like shoes and shoelaces, left and right gloves, etc

TABLE 1

ADJUSTED DIRECT AND INDIRECT REQUIREMENTS FOR ENERGY INPUTS, UNITED STATES, 1967

(input cost expressed in cents per dollar of output)

PRODUCING INDUSTRIES:	CONSUMING INDUSTRIES: Mining, Excluding Fuels	Nondurable Goods Manufacturing[1]	Agriculture	Durable Goods Manufacturing[2]	Transportation and Trade	Construction	Services
Total Petroleum and Natural Gas:							
Crude Petroleum and Natural Gas	1.1	1.4	1.6	0.7	1.0	0.9	0.6
Petroleum Refining	0.8	1.2	1.6	0.5	1.0	0.8	0.5
Gas Utilities	1.2	0.8	0.3	0.8	0.4	0.4	0.4
	3.1	3.4	3.5	2.0	2.4	2.1	1.5
Coal Mining	0.3	0.3	0.1	0.5	0.1	0.2	0.1
Electric Utilities	2.5	1.2	0.8	1.3	1.1	0.7	0.9
TOTAL ENERGY REQUIREMENTS	5.9	4.9	4.4	3.8	3.6	3.0	2.5

[1]Foods, tobacco, textiles, apparel, paper and allied products, printing and publishing, chemicals, petroleum, rubber, and leather.

[2]Ordnance, lumber and wood products, furniture and fixtures, primary metals, fabricated metal products, machinery, transportation equipment, instruments, and stone, clay, and glass.

Source: Computed from data contained in "The Input-Output Study of the U. S. Economy, 1967: Energy Model," U. S. Dept. of Commerce, Bureau of Economic Analysis, mimeo, 4 pp. See Technical Note for explanation of adjustment procedure.

TABLE 2

EMPLOYMENT SHARES OF MAJOR ECONOMIC SECTORS: U. S., SOUTHEAST, AND INDIVIDUAL STATES

(May 1977)

(percentage of total employment, by geographic division)

	U. S.	Southeast	Ala.	Fla.	Ga.	La.	Miss.	Tenn.
Agriculture	4.8	5.6	6.9	3.3	4.5	4.4	11.3	7.6
Mining, Excluding Fuels[1]	0.3	0.3	0.3	0.3	0.4	0.3	0.1	0.5
Transportation and Trade[2]	24.2	24.5	21.5	28.6	25.3	26.2	19.4	19.9
Durable Goods Manufacturing	13.4	8.7	11.2	6.2	7.5	6.3	14.5	11.6
Nondurable Goods Manufacturing	9.5	11.1	13.9	5.6	16.0	7.5	10.8	15.7
Construction	4.5	4.8	5.1	4.7	4.2	6.6	4.6	3.7
Services[3]	19.2	19.1	15.9	24.0	16.9	18.9	14.6	18.2
Other	24.1	25.9	25.2	27.3	25.2	29.8	24.7	22.8

Because of unavailability of data, the percentages for some employment categories do not correspond exactly to the title of the category. Exceptions in content occur in the following cases:

[1]Mining, Excluding Fuels:

Alabama - Mining, excluding only bituminous coal
Florida - Nonmetallic minerals, except fuels
Georgia and Tennessee - Includes all mining
Louisiana - Nonmetallic minerals
Mississippi - Mining, excluding oil and gas extraction

[2]Transportation and Trade:

Tennessee - Trade only; transportation is included with services

[3]Services, Including Communications, Water, and Sanitary Services:

Alabama and Louisiana - Services, communications, and public utilities
Florida, Georgia, and Mississippi - Services, communications, and electric, gas, and sanitary services
Tennessee - Includes transportation in addition to services, communications, and public utilities

Source: Computed from data contained in **Employment and Earnings** (Bureau of Labor Statistics, U. S. Department of Labor) and in employment releases from individual state labor departments.

The other four states have notably larger shares of industries which are heavily dependent on petroleum and natural gas inputs. Tennessee and Alabama have large shares of nondurable goods manufacturing employment and above-average shares of jobs in agriculture. The agricultural character of Mississippi's economy makes the state vulnerable to cost increases. A high concentration of nondurables manufacturing and a large share of tourist-related transportation and trade jobs place Georgia among the more dependent states. Furthermore, the services sector is below average in importance in each of these states.

Coal Comfort? Another likely thrust of future energy policy is encouragement of conversion from petroleum-related sources of power to alternative fuels such as coal.

BOX 1

CURRENT STATUS OF ENERGY LEGISLATION

The National Energy Act, with most of President Carter's proposed energy program intact, was passed by the House of Representatives in early August. The most important provisions affecting industrial energy costs are outlined below. Since Senate committee hearings have just begun, these programs remain subject to substantial alterations.

1. Crude Oil Prices

The controlled price of domestically produced oil sold to refiners would be increased by a tax to be applied in three steps. By 1980, the price would reach a level equal to the uncontrolled price of crude oil sold in the international market. The tax would terminate on September 30, 1981, along with the President's power to control oil prices. Income tax credits and other payments would offset the purchasing power loss which consumers would suffer as a consequence of higher energy prices.

2. Natural Gas Prices

Natural gas price regulation would continue. The ceiling price for newly discovered gas would rise from the current level of $1.46 per thousand cubic feet to $1.75 immediately. In the future, the price of natural gas would correspond to the price of the amount of domestically produced crude oil which would yield the same amount of energy. To forestall regional gas shortages, the ceiling price would apply to gas produced and sold within a state as well as to gas sold for delivery to another state. The impact of rising natural gas prices would be felt primarily by industrial users initially.

3. Coal Conversion Penalties and Incentives

New utility and industrial plants would be prohibited from burning oil or natural gas, with some exceptions based on environmental or economic considerations. Existing utilities would be required to cease burning natural gas by 1990. Plants which are now capable of burning coal could be required to use coal rather than oil or natural gas. A system of penalty taxes would be applied to industrial users of oil and natural gas beginning in 1979 and to utility companies beginning in 1983. These taxes would increase year by year to motivate conversions to coal power. Plants using small quantities of oil and gas and firms whose manufacturing process or product quality would be seriously impaired by use of other fuels could be exempt from the oil- and gas-users' tax. A company could credit expenditures for conversion to alternate fuel sources against its user taxes (disqualifying the investment for the 10-percent general investment tax credit) or it could take an additional 10-percent tax credit for investments in energy equipment. To hasten conversions, the latter option would apply only through 1982. In addition, any oil- or gas-burning boiler purchased after June 20, 1977, would no longer qualify for the regular 10-percent investment tax credit or for depreciation at an accelerated rate.

For summaries of the provisions of the National Energy Act, see **The Wall Street Journal**, August 8, 1977, p. 4, and **Congressional Quarterly Weekly Report**, Vol. 35, No. 2 (August 6, 1977), pp. 1624-1625

Since the costs of coal-burning processes seem likely to fall relative to oil and natural gas, an effort to assess potential price effects must consider the reliance on coal energy by major sectors.[4]

A lower price for coal relative to petroleum-related fuels would favor areas where coal-using industries are concentrated. We can be fairly sure that coal-burning facilities are concentrated in the older manufacturing centers of the Northeast and Midwest. The "new" centers in the South, Southwest, and West grew in the postwar period of inexpensive, readily available, efficiently burning natural gas. Therefore, the change in relative energy cost in favor of coal will probably penalize manufacturers in these regions and

[4] This analysis does not include the influence of fuels used to generate electricity, which is derived from a variety of primary energy sources. Relative to the U. S., the Southeast derives a much *higher* share of its electric power from coal and a much *lower* proportion from natural gas. The shares of electricity supplied by oil and nuclear power are about the same regionally as nationally, while the national percentage of hydroelectric power is significantly greater. On balance, smaller cost increases in electric power are likely to be experienced in the Southeast than in the nation as a whole. See Table VI, pp. 18-19, in **1977 Annual Electric Power Survey,** published by the Edison Electric Institute.

BOX 2

A KEY TO THE ENERGY-DEPENDENCE RIDDLE

Input-Output Data. How does one spot a heavily energy-dependent industry? "Input-output" studies provide a key to this problem in the form of a detailed "shopping list" for each major sector of the economy. These data indicate the "ingredients" required for each sector's production, including the value of key raw materials obtained from other industries, labor compensation, profits, and taxes. One variety of input-output data shows the value in cents of each input directly consumed to produce one dollar's value of output for each industry.[1] A second variety of "shopping list" shows the value in cents of the direct input requirements *plus* the indirect requirements generated by a one-dollar increase in output for each industry. The industry energy requirements presented in Table 1 and Chart 1 of the accompanying article are based on such input-output data.

Recency and Other Reservations About the Data. Although the input-output information seems well suited for an investigation of energy dependence, it has been used with some reservations. First, the data are not very current. The most recently published data are for the 1971 calendar year.[2] Furthermore, even older data have been used for this study. A special tabulation of the 1967 input-outpu data is available, which offers two majo advantages: First, it provides greater deta for energy-producing industries; second, reduces the degree of detail for nonenerg industries by aggregating them into majo economic sectors.[3]

Use of ten-year-old data creates som risks, of course. Changes in technology prices, demand patterns, and product mi may have significantly altered the patter of industrial input use since 1967.

A second reservation concerns th representativeness of the data. The input output numbers discussed below are broa averages which apply to the entire Unite States. However, conditions within pa ticular regions, states, industries, and firm may cause input-output patterns to diffe sharply from these average values. On would expect fairly wide variations be tween areas in industry composition and i the efficiency of particular firms. But i the absence of sufficiently precise stat and regional data, the national informatio supplies a useful indication of sectora energy dependence. In discussing thes numbers, we do not wish to imply tha they are typical of all areas.[4]

[1] For a useful description of input-output data, see "The Input-Output Structure of the U. S. Economy, 1967," **Survey of Current Business,** Vol. 54, No. 2 (February 1974), pp. 24-56.

[2] Paula C. Young and Philip M. Ritz, "Input-Output Table of the U. S. Economy, 1971" (Bureau of Economic Analysis Staff Paper No. 28), U. S. Department of Commerce, March 1977.

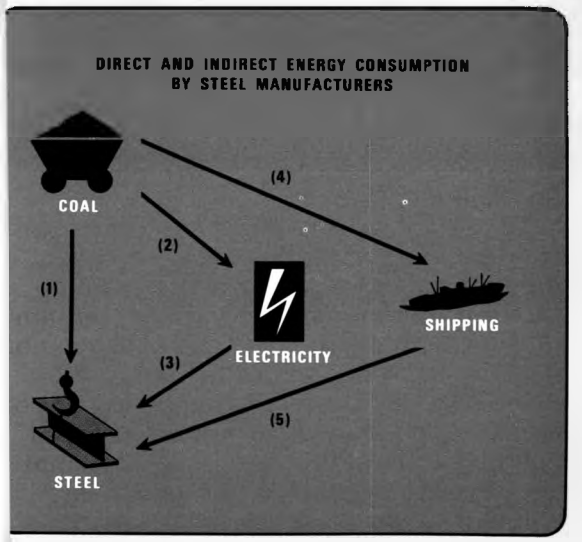
[3] "The Input-Output Study of the U. S. Economy, 1967: Energy Model," U. S. Department of Commerce, Bureau of Economic Analysis, mimeo, 4 pp.

[4] Although input-output studies have been prepared for some states, most do not provide a sufficiently detailed breakdown of energy usage to permit the type o analysis pursued in this study. Also, studies for particular states are usually not comparable. See William A. Schaffer, Eugene A. Laurent, and Ernest M. Sutter, **Using the Georgia Economic Model,** Atlanta, Georgia, Georgia Institute of Technology, 1972.

enhance the competitive positions of the coal-burning facilities of the Northeast and Midwest. However, use of national data on industry coal requirements tends to obscure these regional differences.

As Chart 1 indicated, coal is used most intensively in the durable goods manufacturing sector. But the share of employment provided by durable goods producers is significantly *lower* in the Southeast. Industries which use coal to a moderate degree include mining and nondurable goods manufacturing. As noted previously, mining's employment shares vary little, either between the Southeast and the nation or among the southeastern states. Nondurables is a sector of concentrated employment in the Southeast; but this industry's moderate use of coal only serves to soften somewhat the disadvantage of its heavy reliance on petroleum-related energy.

Relatively heavy concentrations of coal-using industries slightly improve the position of some southeastern states. Tennessee and Alabama, heavily dependent



Adjustment to Eliminate Understatement r Overstatement. The input-output data ıat appear in Table 1 and Chart 1 have een adjusted to avoid understating or verstating energy requirements. The steel ıdustry provides a convenient example of ıe need for such adjustments.

Steel production processes use large uantities of both coal and electricity. ımitting other energy sources for the moıent, how would one properly represent the eel industry's energy dependence? One ɔuld sum the values of the direct reuirements for coal and electricity (1 and 3 the diagram). Although the value of coal ɔed to generate electricity (2) is included in ıe value of the electricity used in steelmakg (3), this procedure would result in a serious underestimate of energy consumption, since coal is also used to produce numerous other "ingredients" for steelmaking. These inputs are represented in the diagram by shipping, which is assumed to be coal-powered. Measuring the energy dependence of steel manufacturing by summing only its *direct* energy inputs would omit the energy content of these nonenergy inputs (4).

Then, why not add together the direct *and indirect* requirements for energy inputs? This approach would *overstate* energy dependence because of double counting. In the preceding diagram, steel manufacturers' direct and indirect consumption of coal (1, 2, and 4) would be included. But the value of coal used to generate electricity (2) would be counted a second time as part of the value of the electricity input directly consumed in steel production (3).

The direct and indirect input coefficients (cents per dollar of output produced) for each major energy source have been modified to eliminate this source of overstatement. In simple terms, the modification employed here takes the sum of input flows (1) and (4) as the measure of coal input dependency and classifies segment (3) as the measure of dependence on electricity.[5] That is, the value of energy used to produce energy is measured in its *final* form as a *direct* input.

[5]For a more detailed explanation of the adjustment method used, please consult the technical note at the conclusion of this article

on petroleum-related inputs, also have greater-than-average employment shares in durable goods and nondurable goods manufacturing. Mississippi, the District state with the largest durable goods job concentration, should benefit to some extent from any shift of energy prices in favor of coal.

Despite the potential benefits to coal users, the present role of coal inputs is minor compared to that of petroleum and natural gas energy sources. In the manufacture of durable goods, the value of the coal used to generate one dollar of output is one quarter of the cost of petroleum and natural gas required. For the other industries, it amounts to only one-tenth or less. Unless the mix of fuel consumption is altered markedly, coal price incentives will cushion the impact of increasing energy costs only slightly.

IMPLICATIONS FOR SOUTHEASTERN GROWTH

Although producers throughout the nation will face increasing energy costs, incipient changes in energy prices and use patterns will probably have a stronger impact in the Southeast than in the nation as a whole. Heavy use of petroleum and natural gas will be discouraged, but southeastern industries are more dependent on these fuels than are their national counterparts. Fuel consumption will be shifted to nonpetroleum sources, especially coal; and with the exception of

TECHNICAL NOTE

As shown in the example in Box 2, the problem of double counting arises when energy sector A uses inputs from energy sector B, resulting in an overlap of direct consumption of sector A's product with indirect consumption of sector B's product. The key to identifying these areas of duplication is Table T-1, which gives the direct and indirect energy input requirements of the five energy-producing sectors.

The procedure used in this study to adjust for double counting began by summing the coefficients for the inputs provided by the other four energy sectors to the particular sector under consideration (calculating a total for each column of Table T-1). Thus, adding the requirements of the coal mining industry from the crude petroleum and natural gas, petroleum refining, electrical utility, and gas utility industries provided a sum for coal mining. This sum indicates the relative importance of other energy inputs, directly and indirectly required, in the production of coal. Note that this fraction, about 6 percent in the case of coal mining, measures the extent to which another sector's *direct* consumption of coal would overlap the *indirect* consumption (via direct use of coal) of the other four forms of energy. That is, for each $1 of coal supplied to coal-consuming industries, approximately 6 cents would be counted again as energy inputs obtained indirectly by those industries from other energy-producing sectors.

The adjustment required to correct this overlap is to reduce the value of coal inputs by about 6 percent. The exact factor is obtained by subtracting the sum of the energy input coefficients to the coa industry from 1.0 (see Table T-1). In this case, about 94 percent of the value of coa inputs supplied to other industries is *not* counted within other energy sector input coefficients. In each of the remaining columns of the table, an identical procedure is followed to obtain the adjustment factors shown on the bottom lin of the table.

This explains how the adjustment facto were derived; but how were they applied? For each of the five energy sectors, the original requirement coefficient for each input (shown in Table T-2) was multiplied by the adjustment factor for that input (a given in Table T-1). The resulting adjusted direct and indirect input requirements are presented in Table 1 of the article. Thus, for coal mining inputs, the agricultural sector's coefficient was changed from .00125 to .00117 (= .9373 x .00125) and th durable goods manufacturing sector's coefficient was altered from .00549 to .00515 (= .9373 x .00549), etc.

electrical power generation, coal-burning facilities are relatively scarce in the Southeast.

As their production costs begin to increase, relatively heavy users of petroleum and natural gas will face an unappealing choice. They can attempt to absorb rising energy costs by controlling other costs, increasing prices, or sacrificing net income. Or they can undertake major capital investment programs to convert to alternative fuels, primarily coal. But tax incentives for coal conversion would only partly offset the additional financing costs incurred. Such investments would absorb capital that could be invested in new or expanded facilities. Producers faced with conversion may find that their ability to enter new markets, offer new or improved products, and increase production efficiency via investment is hampered, at least temporarily. For some small-scale producers, coal conversion may be so costly as to be unprofitable and difficult to finance. Without the conversion option, higher prices of fuels presently used could force them to curtail operations.

Thus, a number of uncertainties cloud a definitive conclusion concerning the effects of energy costs on the outlook for southeastern economic growth. The most certain aspect of the outlook is that considerable turbulence is in store before adjustments to the new realities of energy supplies and prices are completed. ■

TABLE T-1

ENERGY SECTORS: DIRECT AND INDIRECT INPUT REQUIREMENTS, 1967

	CONSUMING INDUSTRIES: Coal Mining	Crude Petroleum and Natural Gas	Petroleum Refining	Electrical Utilities	Gas Utilities
PRODUCING INDUSTRIES:					
Coal Mining	–	.00124	.00162	.06684	.00110
Crude Petroleum and Natural Gas	.00960	–	.49695	.02111	.28325
Petroleum Refining	.01800	.00654	–	.02104	.00435
Electrical Utilities	.03062	.01264	.01476	–	.00818
Gas Utilities	.00448	.00719	.02234	.06191	–
Sum of Energy Input Coefficients	.06270	.02761	.53567	.17090	.29688
1.0 - (Sum of Energy Input Coefficients)	.93730	.97239	.46433	.82910	.70312

Source: "The Input-Output Study of the U. S. Economy, 1967: Energy Model" and computations.

TABLE T-2

DIRECT AND INDIRECT REQUIREMENTS PER DOLLAR OF DELIVERY TO FINAL DEMAND

	CONSUMING INDUSTRIES: Agriculture	Mining, Excluding Fuels	Construction	Durable Goods Manufacturing	Nondurable Goods Manufacturing	Transportation and Trade	Services
PRODUCING INDUSTRIES:							
Coal Mining	.00125	.00365	.00215	.00549	.00305	.00114	.00127
Crude Petroleum and Natural Gas	.01678	.01127	.00945	.00687	.01423	.01069	.00627
Petroleum Refining	.03440	.01722	.01809	.01019	.02578	.02048	.01010
Electric Utilities	.00940	.03022	.00845	.01509	.01506	.01335	.01077
Gas Utilities	.00448	.01772	.00557	.01136	.01080	.00573	.00536

Source: "The Input-Output Study of the U. S. Economy, 1967: Energy Model."