goods and services to reduce their output, and, in turn, the amounts of labor and capital they would employ. By hiring less labor and by investing less, firms would lower the level of national income and perpetuate the downward movement of national income, output, and employment.

These trends would be reversed as the economy adjusted to higher gas prices. Consumers would reduce their gas consumption and adjust their spending on other goods and services in response to higher gas prices and the associated price increases for other goods. Firms in the gas industry would spend their additional revenues either by purchasing new capital equipment or by increasing wages or dividends. Moreover, firms that produce nongas goods and services would substitute other, less expensive fuels for gas and improve the efficiency of gas-burning equipment. Also during this adjustment process nongas firms might increase their employment and investment, as input substitutions occur and as consumer spending rebounds. All of these activities--hiring workers and investing in equipment to produce gas, substituting other fuels for gas and new equipment or labor for energy in producing goods and services--constitute the mechanisms that generate the efficiency gains discussed in Chapter III. These gains would allow the economy to produce more output with fewer inputs and thereby raise national income and product. Thus, after an initial period of dislocation that would reduce national income, output, and employment, the economy would begin to adjust and pave the way to higher output and employment.

All of these adjustments would take place within the context of federal economic policy. The conduct of monetary policy would be particularly important during the transition to a new gas pricing regime. The central question is: would the monetary authorities accommodate the higher level of gas prices that would follow decontrol? 3/

Allowing monetary policy to accommodate higher gas prices would have several effects. In general, such a policy would avoid an increase in unemployment at the potential cost of more inflation. Accommodating higher gas prices also would result in smaller initial economic dislocations, since some of the loss of consumer purchasing power would be compensated through easier credit and liquidity in the economy. This would result in smaller losses of income and employment in the short term.

---

3. In response to higher prices, consumers might increase their demand for money. If the Federal Reserve Board allowed the money supply to grow to meet this demand, it would implement an accommodative monetary policy.

In the long term, however, such a policy could impose several costs. First, by risking inflation, an accommodative monetary policy could preclude price decreases in the nongas producing sector of the economy. Thus, in the long term, it might defer some of the inevitable adjustment in this sector. Moreover, to the extent that such a policy increased inflation, it would raise long-term interest rates. By doing so, it would retard the substitution of capital stock for energy by making capital more expensive. In this way, it might also defer the efficiency gains that gas decontrol would set in motion.

A nonaccommodative, or tight, monetary policy would work in the opposite direction. By risking more unemployment rather than more inflation and by reducing liquidity in the economy, tight money could make the immediate dislocation following decontrol more wrenching. But if such a policy resulted in lower inflation--by moderating the rate of price increase in goods and wages--it might offer better prospects for adjusting to higher gas prices. Specifically, if such a policy succeeded in lowering inflationary expectations and, in turn, long-term interest rates, it might facilitate the realization of efficiency gains and provide long-term economic benefits.

There is little consensus within the economics profession regarding the actual effects of monetary policy. Some claim that higher money supply growth raises the price level directly and that this inflation erodes any potential improvement in real economic activity. Others contend that higher money supply growth immediately lowers interest rates by increasing the supply of credit and that, although some inflation may ensue, real activity will expand as a result. It is not the purpose of this or any other analysis of the gas market to resolve this question. But for purposes of comparing analyses, the following questions must be addressed:

- What assumptions are made with regard to the conduct of monetary policy during the adjustment period following decontrol?
- What are the effects of alternative assumptions regarding monetary policy?
- Through what mechanism--be it interest rates, inflation rates, or aggregate purchasing power--does monetary policy influence the economy's transition to decontrolled gas prices?

CHAPTER V. DISTRIBUTIONAL CONSEQUENCES OF DECONTROL

As the previous chapters have shown, natural gas decontrol might provide the economy with potential long-run gains in efficiency and possible short-run losses in output, employment, and income. Both the economic gains and losses are measured by the same indexes, which show the gains and losses to the economy as a whole. These aggregate indicators of economic movement do not satisfactorily describe changes in the distribution of income. Since the efficiency gains and macroeconomic adjustment costs could accrue unevenly, any analysis of the decontrol of natural gas must address its distributional consequences to be complete. In question is not merely whether society as a whole would be better off, but also how the effects of wellhead price decontrol could vary among regions, industries, and income classes.

Natural gas price decontrol would have two sequential sets of distributional effects. First, customers who were once able to obtain gas at the controlled price would pay more for that same gas, and producers who sold this gas at the controlled price would receive higher revenues. Second, certain industries and regions would change as the economy adjusted to a new set of higher gas prices and a different mix of goods and services. An increasing share of GNP would accrue to the natural gas industry, its ancillary industries, and the recipients of the economic benefits derived from greater gas availability. The share of other activities would fall. Gradually, firms, capital, and people would move toward those regions, industries, and activities that expanded in response to gas decontrol, and away from those that experienced a decline in rewards. This chapter discusses distributional aspects associated with these adjustments. The first section outlines the initial effects: who would be likely to pay or receive more. The discussion then turns to the second round of effects: how industries and regions might experience changes.

INITIAL DISTRIBUTIONAL EFFECTS

The initial distributional effects of natural gas decontrol can be analyzed in terms of industry revenues, consumer expenditures, and federal revenues.

Industry Revenues

If decontrol of natural gas prices resulted in significantly higher natural gas prices, an initial transfer of income from natural gas users to producers would occur. The amount of this transfer would be determined by reductions in gas demand caused by higher prices and the adjustment of the economy to decontrol (as discussed in Chapter IV).

Of all the groups in the natural gas industry, only natural gas producers would be likely to receive substantial new revenues under wellhead price decontrol. Distribution and transmission firms are regulated industries and have fixed (by the Federal Energy Regulatory Commission and state Public Utility Commissions) rates of return and prices. Unless the use of gas increased, they could not earn additional income under decontrol.

Natural gas producers can be divided into producer firms, which actually extract natural gas, and royalty owners, who typically own the land or the mineral rights to the land under which the natural gas is found. The new income from decontrol would initially flow to these two groups. Royalty owners typically receive 12 to 15 percent of the price of the natural gas, while producer firms, which have accepted the risks associated with exploration and development, receive 85 to 88 percent of the funds.

Producers of natural gas, as opposed to royalty owners, tend to be publicly owned corporations, often the major oil companies, and any additional income that natural gas decontrol could generate would either be distributed as dividends or reinvested. In either case, the stockholders would be the main recipients of the profits, either through dividends or increased stock valuation which could, if the stocks were sold, be translated into capital gains. Therefore, the ownership of stocks in these firms would largely determine who initially gains from natural gas decontrol. Since stock ownership generally increases with income, increased dividends or increased stock wealth would probably accrue to higher income individuals.

Royalty owners can be individuals, corporations, state and local governments, or the federal government. Royalty owners would receive more income as a result of wellhead deregulation of natural gas since royalty payments are generally determined on a gross receipts basis. In addition to receiving higher income, asset wealth of these groups would increase as the value of the mineral rights rose. The impact on the distribution of income would, therefore, depend on the distribution of royalty ownership. Of all privately held land in the Mississippi Delta and South Plains states, where three-fourths of U.S. natural gas is produced, roughly 70 percent is held by the top 5 percent of owners. Ranch and farmland in these regions is less concentrated, but the top 5 percent still

own roughly one-half of such land. Therefore, if private royalty ownership is distributed similarly to the ownership of land, from which it derives, then most increased payments to private parties would accrue to higher income persons.

Consumer Expenditures

In the event of natural gas decontrol, individual consumers would pay more in two ways: directly through higher purchase prices for gas, and indirectly through higher prices for all goods that use natural gas in their production.

Direct Expenditures. About 50 million households use natural gas, of which 45 million use it as their principal heating source. Between April 1980 and March 1981, residential expenditures on natural gas totaled $19.3 billion. Overall, natural gas accounts for 30 percent of all energy use in the residential sector. Although among people who use natural gas as a heating fuel, the average expenditure was $409 during this period, the amount varied widely by income class and region. Table 3 shows that higher-income classes spend absolutely more on natural gas than do lower-income classes, but that, as with other basic necessities, lower-income groups spend relatively more on natural gas as a percent of family income. This pattern is also true, although to a lesser degree, among households that do not use natural gas for heating.

Large increases in gas prices would reduce income available in household budgets for other uses. As could be expected, natural gas expenditures are much higher in the northeastern and northcentral states than they are in the South and West, because of variations in climate. Table 3 shows that the difference in home heating expenditures between the coldest and the warmest regions is more than two to one. As a percent of total residential energy use, however, natural gas usage is higher in the South and West than in the Northeast, principally because oil heat is still quite common in the Northeast and much more electricity is produced from natural gas in the South and West.

If natural gas prices are decontrolled, these cost patterns might not rise uniformly since each region has a different historical pattern of natural gas use. The Northeast, for example, is served by pipelines with proportionately more gas that is held to low prices under old contracts and the requirements of the Natural Gas Policy Act (NGPA). By contrast, the South has proportionately more higher-priced gas under new contracts. This regional disparity in endowments of low-cost gas might lead to the imbalances discussed in Chapter III--specifically, the inability of unendowed

TABLE 3. ANNUAL NATURAL GAS EXPENDITURES FOR HOUSEHOLDS: APRIL 1980 THROUGH MARCH 1981

Households By Category	Number of Households (In millions)	Expenditures per Household (In current dollars)	As a Percent of 1978 Income
All Households	44.6	409	---
Ranked by 1979 Income			
Less than 5,000	5.5	368	more than 7.4
5,000 to 9,999	7.3	373	5.0
10,000 to 14,999	6.9	385	3.1
15,000 to 19,999	6.6	388	2.2
20,000 to 24,999	6.0	443	2.0
25,000 to 34,999	6.7	438	1.5
over 35,000	5.6	476	less than 1.4
By Region			
Northeast	6.6	618	---
Northcentral	15.0	472	---
South	11.8	342	---
West	11.1	269	---
Urban	37.9	410	---
Rural	6.7	399	---

SOURCE: Department of Energy, Energy Information Administration, Residential Energy Consumption Survey: 1980-1981 Consumption and Expenditures (September 1982).

NOTE: Details may not add to total because of rounding.

regions to compete for new gas supplies. Thus, depending on the way that wellhead decontrol is carried out, specific regions could see very different patterns of price increases. To the extent that delivered gas prices rise to the same level nationally, northeastern and northcentral customers, who have had less expensive gas, would be catching up with southern customers who have paid higher prices for years. In this event, consumers in the

northeast and northcentral regions, who also use more natural gas per household, would experience greater gas price increases than the national average.

If fly-up occurred, as discussed in Chapter III, then intrastate customers might pay higher prices than interstate customers. Since intrastate pipelines lack a cushion of inexpensive gas, they would not have a reserve with which to average the higher-priced marginal gas and so lower their overall prices. Since the interstate pipelines have this advantage, their prices would not rise to as high a level as those in intrastate markets. In sum, interstate gas customers might see bigger price increases, while intrastate customers may see higher prices, depending on the extent of the fly-up. These issues raise the following question: how do endowments of other, cheap gas affect gas prices by region?

Indirect Expenditures. The principal indirect effect of higher natural gas prices would occur through increased electrical bills. In 1980, natural gas was used to produce 15 percent of all electricity in the United States, making it the second major source of electricity after coal (51 percent). In fact, almost 20 percent of the natural gas used in this country produces electricity.

Electrical utilities, however, use natural gas in very different ways. Some, especially in the Mississippi Delta and the South Plains, use natural gas for baseload generation. In Texas, for instance, three-quarters of all electricity was produced by natural gas in 1978. In Louisiana, the figure was almost as high, while in Oklahoma over 85 percent of the electricity was produced using natural gas. In most states, however, natural gas is mainly used for peak-load units and thus their use of natural gas is much lower. In between are half a dozen states that use natural gas for 15 to 40 percent of their electricity generation, mostly in the South and West. The effects of decontrol on consumers would, therefore, depend on the state in which they reside. In general, electrical bills should not increase as significantly in the Northeast, where natural gas constitutes only a small fraction of utilities' gas costs, as in areas where natural gas is burned for baseload generation.

In Texas, Louisiana, Oklahoma, and a few other large gas-producing states, the situation is more complex. Their electric utilities are quite dependent on natural gas, but their intrastate natural gas prices are already relatively higher than the national average. To the extent that the price of natural gas rose above its present level under decontrol, and especially if fly-up occurred, utility customers in those states could face significantly higher electrical bills. In other states, where utilities burn a large amount of interstate natural gas--for example, California and Florida--their customers may also end up paying significantly larger electrical bills.

Effects on Federal Revenues and Expenditures

Royalty Increases. Roughly 30 percent (5.67 trillion cubic feet) of U.S. natural gas is produced on federal lands, making the U.S. government the largest single royalty owner. Since wellhead deregulation of natural gas would increase the value of all royalty payments, including those accruing to the federal government, Treasury revenues would increase directly under accelerated decontrol. The current value of federal royalty payments is $2.9 billion; the extent to which this figure would increase would depend on the specific nature of decontrol policy. The increased revenues would accrue to the Treasury, where they would be merged with other federal receipts. If these increased income flows were respent quickly, they would not contribute to the decline in aggregate output discussed in Chapter IV.

The increase in the value of gas and the consequent rise in severance tax revenues might prove troublesome for revenue-sharing programs. Some revenue-sharing programs base each state's allotment on the state's tax efforts, and state royalties are included in the state's "effort." Thus, an increase in tax receipts from royalties might result in more money being allocated to some gas-producing states without any real increase in their tax effort. To change this redistributive effect would require Congressional action on the treatment of increases in state gas royalties for revenue-sharing purposes. Since oil prices and oil severance tax revenues have already risen, the Congress might wish to address this question under any circumstances.

General Revenues. The deregulation of wellhead natural gas prices would have two rounds of effects on general federal revenues. In the first round, income tax collections, independent of any new excise or other natural gas tax the Congress might impose, should rise as the new natural gas revenues are taxed. Natural gas producers, gas stock owners, royalty owners, and firms producing goods and services for the industry would have larger income tax liabilities. These larger revenues would be offset only by the increased expenses of businesses that use natural gas; increased household expenditures on natural gas would not lower individual tax liabilities.

The second round of effects, however, might lower federal tax receipts if the income effects discussed in Chapter IV lowered aggregate economic activity. But even if aggregate economic activity did not decline, federal revenues might decrease if producers and others at the receiving end of the income flows had a lower effective tax rate than did the economy as a whole.

Decontrol would also change federal outlays. By changing the rates of unemployment and inflation, decontrol would require changes in the level of indexed transfer payments and of means-tested income support programs. The effects of decontrol on net federal revenues, therefore, would ultimately depend on its macroeconomic effects. 1/ Any analysis of gas decontrol must ask: how does decontrol affect federal revenues and outlays? What macroeconomic effects contribute to these budgetary influences?

CHANGES IN THE COMPOSITION OF THE ECONOMY

As outlined in previous chapters, the income transfers that probably would accompany decontrol would have significant effects on aggregate economic activity. In the short run, consumers might reduce other discretionary spending since they would pay higher natural gas bills. This could have significant effects on industries whose demand depended on this discretionary spending. The relative values of natural gas and all other goods would shift in favor of natural gas producers. This shift would, in turn, increase the share of GNP claimed by industries in the natural gas sector at the expense of the other sectors of the economy. Unlike the decline in consumer demand, this shift in the composition of GNP shares would not be temporary. The relative value of output of the affected sectors vis-a-vis the natural gas industry would be permanently depressed.

Since the revenues of the natural gas industry would rise, resources, capital, and labor could be expected to move into that sector and out of the sectors whose incomes had been reduced. Barriers exist to slow the free movement of resources into some sectors and out of others, however, and different resources move at different rates. Thus, even within the sectors experiencing a relative decline, some factors of production might experience a greater decline than others because of institutional and other constraints to movement. For example, financial capital could move relatively quickly into the natural gas sector, but fixed assets could only be liquidated slowly and not necessarily at long-run full value. In the meantime, the return to financial capital would have increased while that of physical assets would have further decreased. Each sector of the economy, therefore, would be likely to experience a different constellation of effects.

---

1. For details, see CBO, Natural Gas Pricing Policies: Implications for the Federal Budget.

This section outlines the probable second round effects of natural gas decontrol on the gas-producing sector, other industries, and the long-run distribution of income.

Natural Gas-Producing Sector

The energy-producing sector would experience an increase in revenues from natural gas production. Energy producers would gain first, but inevitably some of its increased revenues would flow to ancillary gas industries as producers sought to expand their capacity. Service industries would also receive some of this additional income, as added wealth and income produced demands for a larger and broader array of goods and services.

Growth in the energy producing sector would probably be asymmetrical, however. If the experience of the oil industry under rising prices is repeated, it can be expected that gas distribution and marketing industries would experience stagnation and even decline, in spite of production increases. Table 4 shows that total employment in the oil industry has risen by one-third from 1973 to 1981, the period of rapidly escalating oil prices. But a closer look at the numbers reveals that the distribution and retailing segments of the industry have been stagnant. Wholesale and retail dealer employment has exhibited no significant change. Employment in service stations decreased by 8 percent, although this may have resulted from the increase of self-service gasoline retailers. Even oil pipelines have experienced no large increase in employment in absolute terms, which suggests a period of stagnation, considering that the Alaskan pipeline was built during this period. Outside the production segment, only petroleum refining, which is in an intermediate position between production and distribution, has seen any increase in employment.

In oil production, however, the growth has been large; extraction employment has almost doubled. Furthermore, those sub-industries that support production activities have seen the highest growth. Oil and gas field services have nearly tripled, while employment in the production of rigs and other capital inputs has more than doubled. To the extent that employment can serve as a proxy for other economic activity, this table indicates a large shift in activity toward oil production and, relatively, away from distribution.

If this same trend occurred in the natural gas industry, employment might not increase in gas transmission and distribution industries upon decontrol. Increasing final prices might produce a decline in gas sales for some pipelines, which could prove quite costly for some of them, given

TABLE 4. EMPLOYMENT IN THE OIL INDUSTRY (By fiscal year, in thousands of workers)

	July 1973	July 1974	July 1975	July 1976	July 1977	July 1978	July 1979	July 1980	July 1981[a]
Oil and Gas Extraction	136.6	147.8	164.6	170.5	179.9	183.4	202.9	231.9	267.8
Oil and Gas Field Services	134.0	150.0	178.2	197.1	234.7	245.0	279.4	335.8	407.2
Oil Pipelines	19.1	17.1	17.0	17.2	17.1	19.7	20.5	22.5	23.2
Petroleum Refining	149.7	158.1	159.1	159.1	164.4	165.7	167.5	167.8	172.3
Petroleum and Petroleum Products (wholesale trade)	NA	NA	NA	NA	NA	228.3	227.9	224.7	226.9
Service Stations	616.8	625.8	622.3	631.8	625.7	652.9	546.7	566.3	563.7
Retail Fuel Dealers	98.7	97.7	95.5	95.1	95.0	96.4	100.7	100.7	100.7
Oil Field Machinery	49.3	50.7	66.4	68.4	73.0	77.2	86.1	93.8	111.7
Total[b]	1204.2	1247.2	1303.1	1339.2	1389.8	1440.3	1403.8	1518.8	1646.6

SOURCE: Bureau of Labor Statistics, Employment and Earnings, various years.
NOTE: NA = not applicable.
a. Preliminary.
b. Total does not include petroleum and petroleum products in wholesale trade because data prior to 1978 are not available.

distribution and transmission companies' high level of fixed costs. Other distribution and transmission firms might benefit from the construction of new pipelines and networks, however, since their rate of return is determined on undepreciated capital stock, rather than the volume of gas passing through their facilities. To the extent that price decontrol eliminates curtailments, new customers might be allowed to hook up. If these new customers needed new pipelines or distribution networks or large extensions of the old ones, distribution and transmission companies could add to their rate bases. If whole new subdivisions or industrial parks were allowed to connect up, this might be a significant addition to any single company's rate base. It should be noted, however, that this would be a period of decreasing, not increasing, demand because of higher prices.

Table 4 also indicates that growth in employment in the oil and gas field and equipment industries took time. For example, employment tripled, but over eight years. Significant delays might mean that industry growth would not be large enough to counterbalance the decline in consumption and nongas production discussed in Chapter IV. But because of the recent slump in the oil production industry, equipment and labor might be available in the region and industries that would expand following gas decontrol, thus reducing delays in growth.

If this pattern of growth occurred in the gas sector, most of the new employment and output could be concentrated in the natural gas-producing regions, while the distributive segments of the industry, which are scattered nationwide, would not benefit as much. The regional concentration of expanded employment could also apply to ancillary industries, most of which are necessarily near the gas wells. For example, over 80 percent of employment in the oil field machinery industry, which produces most of the equipment needed for drilling gas wells, is in the three leading gas-producing states. The major exceptions to this tendency are pipe companies. Oil and gas wells account for 40 percent of all pipe used in this country. Most of that pipe is produced in the Midwest and East, where very little gas is produced. This industry is relatively small, however, employing slightly more than 30,000 nationwide. Even a large expansion of the pipe industry would not raise total employment significantly. Any analysis of gas decontrol must ask: how does decontrol affect the level of employment in the gas industry?

Nongas-Producing Sectors

The nonenergy-producing sectors would be affected by natural gas price increases in two parallel ways. First, the costs of a major input--natural gas--would have gone up and the ability of any given firm to

pass along that cost would depend on the demand conditions it faces. To the extent that costs could not be passed through, profits would drop. Since, in the aggregate, nonenergy-producing sectors would lose income, these industries would have to determine how the losses would be divided. Second, even in sectors that were not major consumers of energy, the macroeconomic effects of natural gas deregulation could entail a loss. If consumers, feeling a loss of real disposable income, reduced consumption of nongas goods, then industries could experience declines in demand, independent of their cost increases. This raises the following question: how much employment would be sacrificed outside the gas industry because of macroeconomic effects?

Gas-Using Industries. In addition to higher utility bills under decontrol, consumers of natural gas would pay higher prices for all goods whose costs included natural gas. For example, natural gas, not including the electricity produced by it, accounted for 30 percent of all energy used by industry in 1978. In the commercial sector, natural gas accounted for over 20 percent of the energy used in 1978, again not including the electricity generated from natural gas. Since it constitutes such a large fraction of the energy used in the production of goods and services, many price increases could be expected if the price of natural gas rose.

Some price rises might be tempered by fuel switching, as industrial users change from natural gas to alternatives, such as electricity, coal, or number six fuel oil. Since many commercial and industrial firms, however, would have limited alternatives, they would have to pass on the higher gas costs or absorb them.

Apart from firms that could switch fuels and those few low-cost firms in competitive markets, however, the bulk of firms would in all likelihood raise their prices. The extent to which the incidence of higher prices would be passed forward would depend on the relative importance of natural gas in their total costs and, in the long run, possibilities for conservation or fuel switching. In most industries, energy costs represent only a small fraction of the final cost, typically as little as 5 percent. Even in the gas utility industry, gas costs are only 45 percent of final costs to customers. Thus, any one price increase is not likely to be large.

Large industrial gas users might benefit from the increased availabilty of gas resulting from wellhead price deregulation. The extra gas on the market would result in fewer and more predictable supply interruptions, which are costly and disruptive. In any event, depending on the details of the deregulation plan, large industrial users might have more leverage with gas utilities and transmission companies so that they could receive more compensation for interruptions than they now do. This potential realign-

ment in supply is an example of the efficiency gains outlined in Chapter III, as previously unmet demands are satisfied.

Industries whose costs have risen might be affected in several ways. They could be threatened by foreign imports whose costs had not risen. Depending on the elasticity of demand in their markets, industries might or might not be able to pass on the new cost. If they could, the quantity demanded might decrease and create excess capacity in the industry. If they could not, the industrial rate of return would decline, which might lead to disinvestment in the industry.

Regionally, all gas-using industries would be affected by decontrol. For example, the chemical and petrochemical industry which is a heavy user of gas (five of the top ten gas-using industries are in this category) tends to be concentrated in the southcentral region. Since much of the industry draws gas from the intrastate market, firms have already adjusted to somewhat higher prices for natural gas. On the other hand, blast furnaces, smelters, metal refiners, and glass industries, which also consume large quantities of natural gas, tend to be concentrated in the eastern and northcentral regions, where gas prices now are lower, but might rise upon decontrol.

Nongas-Using Industries. Even if an industry does not use much gas, it might be affected by increased natural gas prices in two major ways. First, the cost of its inputs, might rise because of cost increases in other industries or, more important, because of increased wage demands as workers seek to maintain their real wages. Second, as outlined above, the transfer of income from consumers to producers would cause a decrease in aggregate demand in the short run. Since consumers would experience a decrease in real income, it is most likely that consumer expenditures, particularly on consumer durables, would decline. Consumer durable industries, like automobiles and their ancillary industries--steel and rubber--might be adversely affected even if they are not gas intensive. Since these industries are geographically concentrated, slowdowns in their activity would inevitably engender decreases in income and employment in specific cities and localities, as the ripple effects made themselves felt.

Regionally, the decline in demand for consumer durables would probably affect the northcentral area most heavily, since these industries are concentrated in the steel belt. The regional effects of increased wage demands are more difficult to sort out.

Long-Run Redistribution of Income Between Capital and Labor

In the long run, the different sectors of the economy and regions of the country would adjust to new natural gas prices as capital stock was turned over and as labor markets adjusted to new circumstances. Adjustment to new relative prices entails a new long-run redistribution of income. Thus far in this analysis, this redistribution of income has been examined from a regional, industrial, and sectoral perspective. In this section, the effect of natural gas decontrol on the division of national income between labor and capital is explored.

The distribution of national income between labor and capital would be determined by how these two factors of production are either substituted for, or used in conjunction with, energy in the production of nonenergy goods, and how they are employed in combination to produce energy.

Substitution Away From Gas. Those manufacturers, residences, and others that used gas prior to wellhead price decontrol would probably reduce their consumption of gas as its price increased. If users wanted to maintain their present level of output or comfort, however, they would have to substitute other things for gas. For example, to conserve natural gas, a household can merely turn down the gas, but if a warm home is desired, insulation and weatherization must be substituted for the natural gas. Similarly, a firm can buy new machines that produce more output or give more service per unit of gas consumed. In both cases, the gas users are substituting new capital for gas.

Labor's share of total national income, however, would be affected by the ability of firms to replace energy with labor--not capital. The natural gas price increase would mean that a larger portion of any firm's income would be spent for natural gas or for capital equipment to save natural gas. Unless the firm could substitute labor for energy or energy-using capital equipment, labor's share of that firm's income would decrease. In the past, firms have tried to save on labor, and the ability of firms to reverse this trend is questionable. Economists are divided as to whether labor would be substituted for gas in the long run. Such substitution can happen in the short run, and some economists argue that labor and energy are short-run substitutes, but long-run complements. Most economists feel, however, that all inputs are substitutes in the long run.

Movement into Gas-Producing Sectors. On average, the natural gas-producing industries are more capital intensive than is the economy as a whole. Should the industry expand, however, it would probably not remain at its current capital-to-output ratio. Since this industry probably would become only more capital intensive during expansion, moving more re-

sources into it would increase capital's share of industry expenditures, and, therefore, national income. The easiest areas in which to find and produce natural gas are already being exploited. Expanded exploration and production would require, therefore, deeper and more difficult wells, which, unless well-drilling technology changes radically, would mean more capital-intensive drilling.