

so that wholesale and retail markups remain constant. After 1985, nominal wellhead natural gas and oil prices are assumed to increase at a 7 percent annual rate. Nominal coal prices are assumed to increase about 5 percent per year. Electricity prices are assumed to increase slightly faster than the underlying inflation rate (approximately 7 percent) and reflect both the rate of assumed increase in oil and coal prices and the need to retire older generating units over time.

Fiscal and Monetary Policy Assumptions

Assumptions regarding the conduct of fiscal and monetary policies also affect the results of this analysis. Two assumptions are made about fiscal policy. First, it is assumed that the statutes governing nondiscretionary spending remain in effect. Thus, should inflation or unemployment increase because of decontrol, expenditures for items such as food stamps, unemployment benefits, and Social Security payments reflect the increases. Second, in this chapter, it is assumed that discretionary expenditures, such as spending for military and other federally procured goods and services, increase at the inflation rate, so that the real level of discretionary spending is preserved. This assumption is varied in Chapter IV. (As inflation increases, discretionary expenditures would decrease in real terms unless the Congress acted to maintain their real level.)

Assumptions regarding the conduct of monetary policy are also critical. Higher prices for natural gas would raise the amount of money that firms and households sought to carry out their transactions. In the light of this initial increase in the transactions demand for money, monetary policy could vary from complete accommodation (allowing the supply of money to increase by the amount that natural gas bills rise) to complete nonaccommodation (fixing the supply of money at some predetermined rate of growth, regardless of any increase in gas prices). The analysis presented in this chapter assumes complete accommodation. If nonaccommodation were to occur, gas price decontrol would result in less inflation but greater losses in output and employment than are described in this chapter. Alternative monetary policy assumptions are incorporated into the analysis in Chapter IV.

THE NGPA, POLICY OPTIONS, AND NATURAL GAS PRICES

NGPA Price Regulations and Options

This report contrasts three natural gas pricing policies to the price path suggested by the NGPA, which serves as the base case. The NGPA

divided all of the nation's gas into three groups for price regulation. The provisions of the NGPA are presented in Table 1, classified into three major categories: supply incentives, consumer protection, and the intrastate market. The first price group (Section 107) was immediately deregulated in 1978. The second group (Sections 102, 103, 105, and some gas under Section 106b) was assigned a price set by formula until January 1, 1985, when it would be deregulated. The third group (Sections 104, 106a, some gas under 106 b, 108, and 109) was assigned formula-based prices and was not decontrolled; their price formulas remain in force in perpetuity. Thus, the NGPA allows a partial deregulation of gas prices on January 1, 1985. Budgetary and macroeconomic effects are reported as changes from CBO's baseline macroeconomic and budgetary projections, which reflect the NGPA. 9

The three policy options discussed in this report are:

- o Complete Decontrol. All wellhead gas prices would be decontrolled on January 1, 1984, regardless of their treatment under the NGPA.
- o Partial Decontrol. All gas prices that would be decontrolled in 1985 under the NGPA would be decontrolled on January 1, 1984. This, in effect, advances the partial deregulation under NGPA by one year.
- o Administrative Decontrol. All gas from older wells in the interstate market (NGPA Sections 104, 106, and 109) would be allowed the higher regulated price afforded gas from new wells (Section 103) on January 1, 1983. Otherwise, the provisions of the NGPA would remain in force.

Natural Gas Prices Under NGPA and The Options

The level of natural gas prices under NGPA and the three policy options would depend on oil prices and contract provisions between producers and purchasers not commonly found in other markets. The contract provisions are important to consider under decontrol since they would largely determine the amount of gas that reaches oil prices. The average wellhead natural gas price, therefore, will be a weighted average of gas that is priced at or near oil prices and gas with prices below oil prices. Table 2

9. Congressional Budget Office, The Economic and Budget Outlook: An Update (September 1982).

TABLE 1. OVERVIEW OF THE NATURAL GAS POLICY ACT OF 1978 a

Sections	Description	Price Escalation Formula	Status as of 1/1/85
Supply Incentives			
102	New natural gas outside existing fields; new reservoirs; new outer continental shelf fields	Inflation plus real growth premium	Deregulated
103	New onshore wells within existing fields	Inflation	Deregulated
107	High-cost gas	Deregulated immediately	Deregulated
108	Stripper wells	Same as 102	Regulated
Consumer Protection			
104	Interstate gas	Same as 103	Regulated
106a	Renegotiated interstate contracts	Same as 103	Regulated
109	All other gas	Same as 103	Regulated
Intrastate Market			
105	Intrastate gas	Tied to new gas prices	Deregulated
106b	Renegotiated intrastate contracts	Same as 103	Deregulated if contract price is greater than \$1.00 per thousand cubic feet

a. The provisions of the NGPA are described more fully in Appendix A.

TABLE 2. NATURAL GAS PRICE PROJECTIONS UNDER ALTERNATIVE GAS PRICING POLICY OPTIONS (By calendar year, in nominal dollars per thousand cubic feet)

Calendar Year	NGPA	Complete Decontrol	Partial Decontrol	Administrative Decontrol
1983	2.75	2.75	2.75	2.87
1984	3.11	4.10	3.43	3.24
1985	3.83	4.38	3.83	3.83
1986	4.10	4.69	4.10	4.10
1987	4.38	5.01	4.38	4.38

NOTE: The figures in this table are average wellhead natural gas prices.

shows the estimated average wellhead prices of natural gas under NGPA and the three policy options for calendar years 1983-1987. Under NGPA, average wellhead natural gas prices increase 23 percent in 1985 from their 1984 levels to \$3.83 per thousand cubic feet. If complete decontrol was adopted on January 1, 1984, then gas prices would increase 49 percent in that year to \$4.10 per thousand cubic feet. A partial decontrol of gas prices in 1984 would increase wellhead prices approximately 25 percent. Finally, administrative decontrol in 1983 would involve a 19.1 percent increase in average wellhead prices from their 1982 levels of \$2.41 per thousand cubic feet as opposed to a 14.1 percent increase under NGPA.

Many analysts have predicted that high oil prices combined with rigid contract provisions would lead to sharp increases in average natural gas wellhead prices under NGPA's partial deregulation in 1985 or under the complete and partial decontrol options in 1984. The estimates presented in this report are lower for two major reasons. First and foremost, the oil price forecasts are much lower than those found in previous studies.¹⁰ Second, this study incorporates information on contract provisions, which indicates the proportion of gas that would rise to oil prices upon decontrol.¹¹ The major assumption here is that all contracts will be

10. See, for example, U.S. Department of Energy, A Study of Alternatives to the Natural Gas Policy Act of 1978 (November 1981).

11. This information is taken from U.S. Department of Energy, Energy Information Administration, Office of Oil and Gas, Natural Gas Producer/Purchaser Contracts and Their Potential Impacts on the Natural Gas Market (June 1982).

implemented as they are written. Therefore, renegotiation of contracts and invocation of "force majeure" clauses are not considered.¹²

Natural gas prices are directly and indirectly affected by oil prices through several key contract provisions:¹³

- o Most-favored-nation clauses set gas prices at an average of the two or three highest prices being paid in the producer's area. These options are sometimes referred to as "two-party or three-party most-favored-nation clauses."
- o Oil parity provisions tie the price of gas, often in the event of deregulation, to the price of crude oil or distillate oil.
- o Take-or-pay provisions require the buyer to pay for predetermined quantities of gas at prespecified prices whether they are purchased or not.

By pegging gas prices at their highest levels, the most-favored-nation clauses would transmit the oil price to other contracts. Take-or-pay provisions would limit the extent to which gas prices could decline. Thus, with decontrol, average natural gas prices might be quickly forced toward the oil prices with little chance of falling in response to supply and demand adjustments.

Under NGPA, the large amount of intrastate gas, compared to interstate gas, to be deregulated in 1985, would tend to dampen price increases, because it has a relatively smaller proportion of contracts with deregulation provisions containing most-favored-nation clauses. More than three times more gas would be decontrolled in the intrastate market than in the interstate market, leading to an estimated 23 percent increase in the average wellhead price between 1984 and 1985. Only 39 percent of the intrastate gas has contract deregulation provisions and, of this amount, 42

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12. "Force majeure" refers to an unexpected and disruptive event that may operate to excuse a party from a contract. Recently, Columbia Gas Transmission Company blamed the current recession for its load loss and since, it argued, this constituted an event outside its control, the company should be excused from buying minimum purchases of gas from Texas Gas Transmission Company. This case has not been resolved.
 13. A more detailed discussion of contract provisions appears in Appendix A.

percent has most-favored-nation clauses. In contrast, about 87 percent of gas in the interstate market has deregulation clauses and, of this amount, 84 percent is governed by most-favored-nation clauses.¹⁴ The price projections under NGPA before 1985 assume that the nominal wellhead natural gas price would increase at an annual rate of 13 to 14 percent.

The estimated increases in wellhead gas prices in 1984 under the complete and partial decontrol options also reflect contract provisions. Under complete decontrol in 1984, gas prices would increase 49 percent, which presumes that roughly 30 percent of all gas would reach oil equivalent prices. The remaining 70 percent would have an average price of \$3.11 per thousand cubic feet so that the average wellhead price would be \$4.10 per thousand cubic feet. These proportions and prices reflect continued softness in world oil prices and the fact that a majority of contracts do not explicitly tie gas prices to oil prices.

BUDGETARY EFFECTS OF THE POLICY OPTIONS

The complete decontrol of wellhead natural gas prices on January 1, 1984, would reduce the fiscal year 1984 budget deficit by \$3.6 billion compared to the CBO baseline.¹⁵ After 1985, the inflationary effects of higher gas prices would dominate so that the cumulative net effect over the 1984 to 1987 period would be a \$5.0 billion reduction in the deficit. Partial decontrol in 1984 would reduce the fiscal year 1984 deficit by \$1.1 billion. The administrative decontrol option would have only a minor effect on the federal budget.

Complete Decontrol in 1984

The complete decontrol option would eliminate price ceilings for all categories of natural gas under the NGPA. This would free gas prices to move toward their equilibrium relationship with oil prices. The adjustment of natural gas prices in the first year of decontrol, however, would be determined largely by price provisions contained in natural gas

14. These data are from U.S. Department of Energy, Natural Gas Producer/Purchaser Contracts and Their Potential Impacts on the Natural Gas Market (June 1982).

15. All budgetary changes in this section are changes from the CBO baseline.

producer/purchaser contracts. Natural gas prices after this time would probably move in tandem with oil market developments.

Macroeconomic Effects of Complete Decontrol. The estimated effects of complete decontrol on output, inflation, and energy demand are presented in Table 3. Complete decontrol on January 1, 1984 would reduce gross domestic product by 0.3 percent in that year. After 1984, gross

TABLE 3. MACROECONOMIC AND ENERGY DEMAND EFFECTS OF COMPLETE NATURAL GAS DECONTROL IN 1984 UNDER BASE ASSUMPTIONS; CHANGES FROM THE BASE CASE (By calendar year)

Variable	1984	1985	1986	1987
Real Gross Domestic Product (GDP) (percent change)	-0.30	0.01	0.04	0.03
Inflation (rate of change)				
GDP deflator	1.10	-0.40	0.00	0.00
Consumer Price Index	1.00	-0.30	0.00	0.00
Unemployment Rate	0.10	-0.06	-0.05	0.00
Natural Gas Demand (percent change)	-2.50	-1.80	-1.30	-1.20
Oil Imports (percent change)	0.60	0.60	0.30	0.30
Nominal Wellhead Natural Gas Prices				
Percent change	31.80	14.40	14.40	14.40
Percent point change a	36.00	-16.30	0.00	0.00

a. Percent point change is a change in a rate of change. For example, since the base case under NGPA involves a 23.7 percent point change in the average wellhead gas price in 1985 and since gas prices increase only 7 percent points in 1985 under complete decontrol, the gas price increase under complete decontrol is 16.3 percent points less than the increase under NGPA in 1985.

domestic output would increase slightly because of generally lower rates of increase in gas prices compared to the NGPA base case (see Table 3) and because substitutions among fuels and other inputs would generate efficiency gains. These later output gains, however, would not offset the first year loss. The cumulative reduction in real gross domestic output over the 1984-1987 period would be about \$6.7 billion (in 1982 dollars).

The complete decontrol option would increase the domestic product price level by 1.0 percent in 1984 and by roughly 0.6 percent annually from 1985 through 1987. In 1985 the rate of inflation would be considerably lower than the NGPA base case, however, since gas prices under complete decontrol would increase at a much lower rate of 7 percent rather than the 23 percent under NGPA. Thus, even though the level of prices would be higher in 1985, the inflation rate would be lower. While complete decontrol would add about one-tenth of a percentage point to the unemployment rate in 1984, it would actually reduce the jobless rate as real output increased afterward.

Natural gas consumption would decline by 2.5 percent in 1984, induced by higher gas prices, which would be 32 percent above the NGPA base case. The reductions in gas demand would be smaller during 1985 and 1987 as accessibility to gas improved. Higher prices, however, would dominate increased accessibility. Oil imports would increase as the substitution of gas for oil resulting from greater accessibility to gas was offset by higher gas prices.

Budgetary Effects of Complete Decontrol. The estimated budgetary effects of complete natural gas decontrol are presented in Table 4. Complete decontrol would reduce the fiscal year 1984 deficit by about \$3.6 billion. Forty-six percent of the \$6.9 billion increase in 1984 revenues and gas royalties would come from higher individual income taxes caused by bracket creep resulting from the inflationary effect of higher gas prices. Corporate taxes and royalties paid by natural gas producers would increase by approximately \$2.0 billion in 1984.

After 1985, the complete decontrol option would result in small reductions in the deficit. Therefore, the cumulative net change over the fiscal year 1984-1987 period would be a deficit reduction of \$5.0 billion. Deficit reductions are smaller after 1984 primarily because the inflation generated by decontrol would increase benefit payments to individuals along with the growth in federal revenues.

TABLE 4. NET BUDGETARY EFFECTS OF COMPLETE NATURAL GAS DECONTROL; CHANGES FROM THE CBO BASELINE (By fiscal year, in billions of nominal dollars)

Budget Component	1984	1985	1986	1987
Revenues				
Individual income taxes	3.2	2.2	2.6	3.1
Corporate income taxes (nonmining)	0.3	0.2	0.2	0.2
Federal excise taxes	0.1	0.1	0.1	0.1
Social insurance taxes	1.3	1.0	1.2	1.6
Corporate income taxes (mining)	1.0	0.6	0.6	0.6
Total revenues	<u>5.9</u>	<u>4.1</u>	<u>4.7</u>	<u>5.6</u>
Outlays				
Benefit payments for individuals	0.9	2.2	3.3	3.6
Government purchase of goods and services	2.4	1.7	1.8	2.1
Natural gas royalties (offsetting receipts)	-1.0	-0.5	-0.6	-0.6
Total outlays	<u>2.3</u>	<u>3.4</u>	<u>4.5</u>	<u>5.1</u>
Net Budgetary Effect a	3.6	0.7	0.2	0.5

a. Positive numbers indicate a reduction in the deficit.

Partial Decontrol in 1984

The partial decontrol option would simply implement in 1984 the scheduled price increases slated to occur under NGPA in 1985. Since this option would not substantially change the structure of natural gas pricing, the efficiency gains resulting from increased accessibility to gas would be very small. Therefore, the simulations measuring the effects of partial decontrol were made assuming the NGPA base case scenario in which accessibility to gas gradually improves over the 1985-1987 period rather than immediately.

Macroeconomic Effects of Partial Decontrol. The major macroeconomic and energy demand effects of the partial decontrol option are presented in Table 5. Partial decontrol would reduce gross domestic product

TABLE 5. MACROECONOMIC AND ENERGY DEMAND EFFECTS OF PARTIAL NATURAL GAS DECONTROL IN 1984 UNDER BASE ASSUMPTIONS; CHANGES FROM THE BASE CASE (By calendar year)

Variable	1984	1985	1986	1987
Real Gross Domestic Product (GDP) (percent change)	-0.10	0.05	0.03	0.00
Inflation (rate of change)				
GDP deflator	0.40	-0.30	0.00	0.00
Consumer Price Index	0.30	-0.30	0.00	0.00
Unemployment Rate	0.00	0.00	0.00	0.00
Natural Gas Demand (percent change)	-1.00	-0.30	-0.20	-0.10
Oil Imports (percent change)	0.30	0.20	0.10	0.10
Nominal Wellhead Natural Gas Prices				
Percent change	10.30	0.00	0.00	0.00
Percent point change ^a	11.60	-11.50	0.00	0.00

- a. Percent point change is a change in a rate of change. For example, since the base case under NGPA involves a 23.7 percent point change in the average wellhead gas price in 1985 and since gas prices increase only 7 percent points in 1985 under partial decontrol, the gas price increase under partial decontrol is 11.5 percent points less than the increase under NGPA in 1985.

in 1984 by approximately 0.1 percent from the NGPA base case. The rate of change in the gross domestic product price deflator would increase by 0.4 percent in 1984 (see Table 5). Natural gas demand would be 1.0 percent lower in 1984 and gradually decline thereafter. As under the complete decontrol option, oil imports would increase.

After 1985, real gross domestic product (GDP) would be slightly higher than in the base case. This would be caused primarily by price-induced

reductions in natural gas demand and the fact that gas prices after 1985 would be no higher than those that would be reached under the NGPA base case. The increases in real GDP in 1985 and 1986 would slightly more than offset the decrease in real GDP in 1984, producing a net gain in real output of about \$0.2 billion (in 1982 dollars) over the period. Thus, the long-term efficiency gains in gross output would offset the short-term macroeconomic adjustment costs imposed by the partial decontrol option. This is in sharp contrast to the complete decontrol option which reflects the deleterious economic effects of sharp increases in energy prices.

Budgetary Effects of Partial Decontrol. The budgetary effects of partial decontrol exhibit a different pattern to those associated with complete decontrol: the first year budgetary surplus is offset by deficits in later years. The budgetary implications of partial decontrol are displayed in Table 6. The net budgetary effect of partial decontrol in 1984 would reduce the deficit by \$1.1 billion. The cumulative effect for the fiscal year 1984-1987 period, however, is a \$0.2 billion increase in the deficit.

Administrative Decontrol in 1983

Administrative decontrol refers to changes in pricing and classification rules that the Federal Energy Regulatory Commission (FERC) could implement under NGPA. Any final action on an administrative decontrol policy would involve a compromise between the Congress, FERC, and other interested parties. In fact, the latitude that FERC is allowed under current law is not clearly defined. Therefore, this report discusses the effects of one possible administrative decontrol option to provide some contrast to the other two options. Under the option presented here, the economy would have more time to adjust to higher gas prices.

There are a myriad of administrative decontrol options that could conceivably receive serious consideration in 1983. The administrative decontrol option considered here would allow prices for NGPA Sections 104, 106 and 109 to rise to the Section 103 price level on January 1, 1983. This action would result in a 19.1 percent increase in natural gas prices in 1983, compared to a 14.1 percent increase in the NGPA base case. This price increase is small relative to the complete and partial decontrol options for three reasons. First, the differential between the NGPA base case natural gas prices and the Section 103 price is only \$0.50 per thousand cubic feet. Second, the amount of reclassified gas is only 32 percent of the total supply. Finally, because of the existence of fixed price escalators in those contracts covering the reclassified gas, only about 70 percent would actually reach the Section 103 price. This latter factor illustrates the somewhat less than

TABLE 6. NET BUDGETARY EFFECTS OF PARTIAL NATURAL GAS DECONTROL; CHANGES FROM THE CBO BASELINE (By fiscal year, in billions of nominal dollars)

Budget Component	1984	1985	1986	1987
Revenues				
Individual income taxes	1.1	0.1	0.2	0.2
Corporate income taxes (nonmining)	0.1	0.0	0.0	0.0
Federal excise taxes	0.0	0.0	0.0	0.0
Social insurance taxes	0.4	0.1	0.1	0.1
Corporate income taxes (mining)	0.3	0.0	0.0	0.0
Total revenues	1.9	0.2	0.3	0.3
Outlays				
Benefit payments for individuals	0.3	0.6	0.7	0.5
Government purchase of goods and services	0.8	0.1	0.1	0.1
Natural gas royalties (offsetting receipts)	-0.3	0.0	0.0	0.0
Total outlays	0.8	0.7	0.8	0.6
Net Budgetary Effect ^a	1.1	-0.5	-0.5	-0.3

a. Positive numbers indicate a reduction in the deficit; negative numbers indicate an increase.

complete impact that regulatory actions have on prices because of producer/purchaser contract provisions.

Macroeconomic Effects of Administrative Decontrol. Administrative decontrol would produce small reductions in output and slight increases in inflation during 1983 and 1984. The macroeconomic and energy demand effects of administrative decontrol are presented in Table 7. Real gross domestic product would decline by 0.05 percent in 1983 and 0.03 percent in 1984. Annual inflation would increase by 0.2 percent in 1983. The reduction in natural gas demand would be 0.4 percent in 1983, peak at 0.6 percent in 1984, and gradually decline after 1985.

The cumulative effect of administrative decontrol on real output and prices would be similar to those effects estimated for partial decontrol

TABLE 7. MACROECONOMIC AND ENERGY DEMAND EFFECTS OF ADMINISTRATIVE DECONTROL IN 1983 UNDER BASE ASSUMPTIONS; CHANGES FROM THE BASE CASE (By calendar year)

Variable	1983	1984	1985	1986	1987
Real Gross Domestic Product (GDP) (percent change)	-0.05	-0.03	0.03	0.02	0.00
Inflation (rate of change)					
GDP deflator	0.20	0.00	-0.20	0.00	0.00
Consumer Price Index	0.20	0.00	-0.10	0.00	0.00
Unemployment Rate	0.00	0.00	0.00	0.00	0.00
Natural Gas Demand (percent change)	-0.40	-0.60	-0.20	-0.10	-0.10
Oil Imports (percent change)	0.10	0.20	0.10	0.10	0.00
Nominal Wellhead Natural Gas Prices					
Percent change	4.40	4.20	0.00	0.00	0.00
Percent point change ^a	5.00	-0.10	-5.10	0.00	0.00

- a. Percent point change is a change in a rate of change. For example, since the base case under NGPA involves a 23.7 percent point change in the average wellhead gas price in 1985 and since gas prices increase only 7 percent points in 1985 under administrative decontrol, the gas price increase under administrative decontrol is 5.1 percent points less than the increase under NGPA in 1985.

except that the increases in gross output would not offset the short-term losses. This would occur because gas prices would be higher than the base case in both 1983 and 1984, whereas in the partial decontrol option prices would be higher only in 1984.

Budgetary Effects of Administrative Decontrol. Since the macroeconomic effects of administrative decontrol would be relatively small, the impact on the federal budget would be equally minor. The estimated effects

of administrative decontrol on federal revenues and outlays are presented in Table 8. The net budgetary effect in fiscal year 1983 would reduce the deficit by \$0.4 billion. In 1984, the change in revenues because of administrative decontrol would again exceed the change in outlays, causing the deficit to decline by \$0.3 billion. After 1984, the deficit would be increased \$0.5 billion, \$0.4 billion, and \$0.2 billion in fiscal years 1985, 1986, and 1987, respectively. The cumulative net budgetary effect of administrative decontrol over the period 1983 to 1987 would increase the deficit by \$0.4 billion. In conclusion, the size of these effects strongly suggests that budgetary considerations, although relevant, should not be a primary element in any debate involving relatively small changes in natural gas prices.

TABLE 8. NET BUDGETARY EFFECTS OF ADMINISTRATIVE NATURAL GAS DECONTROL; CHANGES FROM THE CBO BASELINE (By fiscal year, in billions of nominal dollars)

Budget Component	1983	1984	1985	1986	1987
Revenues					
Individual income taxes	0.4	0.6	0.1	0.1	0.1
Corporate income taxes (nonmining)	0.0	0.1	0.0	0.0	0.0
Federal excise taxes	0.0	0.0	0.0	0.0	0.0
Social insurance taxes	0.2	0.2	0.1	0.1	0.1
Corporate income taxes (mining)	0.1	0.1	0.0	0.0	0.0
Total revenues	<u>0.7</u>	<u>1.0</u>	<u>0.2</u>	<u>0.2</u>	<u>0.2</u>
Outlays					
Benefit payments for individuals	0.1	0.4	0.6	0.5	0.3
Government purchase of goods and services	0.3	0.4	0.1	0.1	0.1
Natural gas royalties (offsetting receipts)	-0.1	-0.1	0.0	0.0	0.0
Total outlays	<u>-0.3</u>	<u>0.7</u>	<u>0.7</u>	<u>0.6</u>	<u>0.4</u>
Net Budgetary Effect ^a	0.4	0.3	-0.5	-0.4	-0.2

a. Positive numbers indicate a reduction in the deficit; negative numbers indicate an increase.

CHAPTER III. SENSITIVITY OF DECONTROL EFFECTS
 TO OIL PRICES

The decontrol of wellhead natural gas prices on January 1, 1984 would reduce the federal deficit by \$3.6 billion in fiscal year 1984. This estimate, presented in Chapter II, is based on the assumption that oil prices, which would influence the price of decontrolled gas, will rise gradually to about \$39.00 per barrel in 1985. As this chapter demonstrates, however, different oil price assumptions can lead to different conclusions about the effects of natural gas decontrol on the federal deficit. If oil prices rose to a higher level--about \$44.00 per barrel in 1985--the fiscal year 1984 deficit would be reduced by \$7.0 billion under complete decontrol. If they fell to \$28.00 per barrel by 1985, complete decontrol would reduce the deficit by only \$1.4 billion.

This chapter first presents these high and low oil price alternatives to the base assumption used in Chapter II. It then discusses the budgetary implications of complete and partial decontrol policies under these alternatives.

HIGH AND LOW OIL AND GAS PRICES

Table 9 presents three possible oil price paths. Under the base assumption, employed in Chapter II, oil prices would rise to about \$39.00 per barrel in 1985. An alternative high path would raise oil prices to \$44.00 per barrel in 1985. The high price alternative could occur if economic recovery was so robust that it increased oil demand. It might also happen if the Iran-Iraq War continued indefinitely and reduced both nations' oil exports. Both of these circumstances would lead to tight gas markets and high oil prices. A low path would cause oil prices to drop to \$28.00 per barrel in that year. The low path could occur if either economic recovery or oil demand continued to be weak, or if OPEC was unable to sustain its present agreements to limit production. Under these conditions, gas markets would be oversupplied and oil prices low.

Table 10 presents estimates for the average wellhead natural gas prices under NGPA in 1985, when a proportion of natural gas is scheduled to be decontrolled. The high price for natural gas at the wellhead in 1985 would be \$4.41, almost 42 percent higher than the 1984 price. The base assumption would be the most likely outcome, with a gas price of \$3.83 per

TABLE 9. ALTERNATIVE DOMESTIC WELLHEAD OIL PRICE ASSUMPTIONS (By calendar year, in nominal dollars per barrel)

Calendar Year	High Oil Price	Base Oil Price	Low Oil Price
1982	30.78	30.78	30.78
1983	36.00	34.00	30.00
1984	39.00	36.38	28.00
1985	44.00	38.93	28.00

thousand cubic feet, over 23 percent higher than the 1984 price. Finally, at the low end of the range, gas would cost \$3.58 per thousand cubic feet, representing a 15 percent increase over 1984.

The proportions listed in the first two lines of Table 10 reflect a range of possibilities for the amount of gas that will be decontrolled in 1985 under NGPA and for the amount with prices reaching the oil price.¹ The proportion of all natural gas that will be decontrolled in 1985 lies between 25 and 40 percent. This range represents estimates of the 1985 level of natural gas production from each of the deregulated categories (NGPA Sections 102, 103, 105, and 106(b)) in response to higher or lower oil and, correspondingly, gas prices. The quantity of gas produced under Section 102 (new natural gas), will probably increase and gas volumes under Section 105 (intrastate gas) will decline. The net change in total deregulated gas is, however, uncertain since the relative composition of the gas supply is very difficult to predict.

The natural gas prices in Table 10 are computed by adding the "reference" price in 1985 (that is, the 1984 price multiplied by an escalation rate of 13 percent) to an increment equal to the proportion of all gas reaching oil parity multiplied by the difference between the price of oil and "reference" natural gas price. The natural gas price under the base oil price scenario is 56 percent of the wellhead crude oil price. The higher ratio for the low case indicates that the market distortion caused by NGPA is relatively smaller as oil prices decline.

1. U.S. Department of Energy, Energy Information Administration, Office of Oil and Gas, Natural Gas Producer/Purchaser Contracts and Their Potential Impacts on the Natural Gas Markets (June 1982).

TABLE 10. CONSTRUCTION OF AVERAGE WELLHEAD NATURAL GAS PRICES IN 1985 UNDER NGPA AND ALTERNATIVE OIL PRICE ASSUMPTIONS

	High Oil Price	Base Oil Price	Low Oil Price
Proportion of All Gas Decontrolled a	0.40	0.32	0.25
Proportion of Decontrolled Gas Rising to Oil Prices a	0.53	0.30	0.20
Oil Prices in Equivalent Gas Units (dollars per thousand cubic feet)	7.78	6.89	4.95
Natural Gas Price (dollars per thousand cubic feet)	4.41	3.83	3.59
Gas/Oil Price Ratio	0.57	0.56	0.72

- a. These proportions were calculated from Tables 18 and 19 in U.S. Department of Energy, Natural Gas Producer/Purchaser Contracts and their Potential Impacts on the Natural Gas Market (June 1982). The effect of oil prices on the proportion of gas to be decontrolled is explained in the text.

The level of oil prices not only determines the level of gas prices under the NGPA, but also determines the price to which gas will rise under other deregulation proposals as well. Table 11 depicts projected wellhead gas prices under complete decontrol for each of the three oil price paths. With oil prices higher than the base price assumption, gas prices would rise by 86 percent under complete decontrol, from \$2.75 per thousand cubic feet in 1983 to \$5.12 in 1984. If the lower price path prevailed, decontrol would only raise gas prices by 26 percent, to \$3.47 in 1984. Table 12 presents similar estimates for the partial decontrol option. The low oil price scenario would result in a 16 percent increase in wellhead gas prices under partial decontrol, from \$2.75 per thousand cubic feet in 1983 to \$3.20 in 1984, while the high price case would result in a 42 percent increase, from \$2.75 per thousand cubic feet to \$3.91 in 1984.

TABLE 11. SCENARIOS FOR AVERAGE WELLHEAD NATURAL GAS PRICES UNDER COMPLETE DECONTROL IN 1984 (By calendar year, in nominal dollars per thousand cubic feet)

Calendar Year	High Oil Price	Base Oil Price	Low Oil Price
1983	2.75	2.75	2.75
1984	5.12	4.10	3.47
1985	5.48	4.38	3.71
1986	5.86	4.69	3.97
1986	6.27	5.01	4.25

TABLE 12. SCENARIOS FOR WELLHEAD NATURAL GAS PRICES UNDER PARTIAL DECONTROL IN 1984 (By calendar year, in nominal dollars per thousand cubic feet)

Calendar Year	High Oil Price	Base Oil Price	Low Oil Price
1983	2.75	2.75	2.75
1984	3.91	3.43	3.20
1985	4.41	3.83	3.58
1986	4.72	4.10	3.83
1987	5.05	4.38	4.10

BUDGETARY EFFECTS OF GAS DECONTROL UNDER ALTERNATIVE PRICE SCENARIOS

The budgetary effects of gas decontrol have been presented to this point in the form of changes from the CBO baseline projections. However, higher (or lower) oil prices would do more than influence the level of these departures from the baseline budgetary projections; they would also change the baselines themselves. Higher oil prices would raise oil windfall profits and other tax collections, while the resulting inflation would increase spending for indexed payments for individuals.

NGPA Base Case. Even if NGPA remained in force, higher oil prices would reduce the federal deficit somewhat since taxes would increase more than spending (see Table 13). The budget deficit would shrink by \$3.3 billion in fiscal year 1984. In fiscal year 1985, the deficit would be reduced by \$7.3 billion because both natural gas and oil prices would increase from the base price scenario. The cumulative deficit reduction for fiscal years 1983-1987 would be \$25.3 billion. Corporate and windfall profits taxes and royalties paid by the mining sector would increase sharply in fiscal year 1985. The effective corporate tax rate used to compute the change in corporate taxes in the mining sector is 25.6 percent. This method assumes that corporations would not utilize unused tax credits on foreign income taxes to shelter additional U.S. income from oil and gas sales. If the foreign credits were

TABLE 13. NET BUDGETARY EFFECTS OF THE HIGH OIL PRICE SCENARIO UNDER NGPA; CHANGES FROM THE CBO BASE-LINE (By fiscal year, in billions of nominal dollars)

Budget Component	1983	1984	1985	1986	1987
Revenues					
Individual income taxes	1.6	2.8	6.4	7.7	9.4
Corporate income taxes (nonmining)	-0.1	0.0	0.1	0.2	0.2
Federal excise taxes	0.1	0.1	0.2	0.3	0.4
Social insurance taxes	0.5	0.8	2.5	3.3	4.1
Corporate income taxes (mining)	0.5	0.9	2.4	2.6	2.6
Windfall profits	1.4	1.8	3.5	3.8	4.1
Total revenues	<u>4.0</u>	<u>6.4</u>	<u>15.1</u>	<u>17.9</u>	<u>20.8</u>
Outlays					
Benefit payments for individuals	0.4	1.6	4.0	7.0	9.6
Government purchase of goods and services	1.0	1.5	4.3	5.2	6.0
Natural gas royalties (offsetting receipts)	0.0	0.0	-0.5	-0.6	-0.6
Total outlays	<u>1.4</u>	<u>3.1</u>	<u>7.8</u>	<u>11.6</u>	<u>15.0</u>
Net Budgetary Effect ^a	2.6	3.3	7.3	6.3	5.8

a. Positive numbers indicate a reduction in the deficit.

fully utilized, then the effective rate would drop to roughly 4 percent. This would lower the deficit reduction in 1985 by \$2 billion, from \$7.3 billion to \$5.3 billion.

The budgetary implications of the low oil price scenario under NGPA are presented in Table 14. This scenario would result in higher deficits through fiscal year 1987, primarily because of lower tax receipts. The cumulative increase in the deficit for fiscal years 1983-1987 would be \$41.3 billion.

TABLE 14. NET BUDGETARY EFFECTS OF THE LOW OIL PRICE SCENARIO UNDER NGPA; CHANGES FROM THE CBO BASE-LINE (By fiscal year, in billions of nominal dollars)

Budget Component	1983	1984	1985	1986	1987
Revenues					
Individual income taxes	-3.2	-8.2	-11.2	-13.6	-16.5
Corporate income taxes (nonmining)	0.1	0.1	-0.2	-0.4	-0.4
Federal excise taxes	-0.1	-0.2	-0.4	-0.6	-0.7
Social insurance taxes	-1.0	-2.5	-4.5	-5.9	-7.3
Corporate income taxes (mining)	-0.9	-2.3	-3.0	-3.1	-3.2
Windfall profits	-2.8	-5.8	-7.6	-8.2	-8.7
Total revenues	<u>-7.9</u>	<u>-18.9</u>	<u>-26.9</u>	<u>-31.8</u>	<u>-36.8</u>
Outlays					
Benefit payments for individuals	-0.9	-4.1	-9.5	-14.9	-18.5
Government purchase of goods and services	-2.1	-4.8	-7.6	-9.0	-10.4
Natural gas royalties (offsetting receipts)	0.0	0.0	0.2	0.3	0.3
Total outlays	<u>-3.0</u>	<u>-8.9</u>	<u>-16.9</u>	<u>-23.6</u>	<u>-28.6</u>
Net Budgetary Effect a	-4.9	-10.0	-10.0	-8.2	-8.2

a. Positive numbers indicate a reduction in the budget deficit; negative numbers indicate an increase.

In conclusion, the budgetary sensitivity of NGPA to oil price changes is fairly small. Even with oil prices as high as \$44 per barrel in 1985 or as low as \$28 per barrel in 1985, the changes in the 1985 deficit would be a \$7.3 billion reduction and a \$10 billion increase, respectively.

Complete Decontrol in 1984

Sensitivity estimates of output, inflation, natural gas demand, and net budgetary balance to oil price changes under complete decontrol are presented in Table 15. In 1984, this decontrol option under high oil prices would reduce output by 0.6 percent and increase inflation by 2.1 percent. On the other hand, under low oil prices the output loss from decontrol would be only 0.1 percent and inflation would increase 0.4 percent.

Under the high oil price scenario, with complete decontrol, the deficit would be reduced by \$7.0 billion in fiscal year 1984 relative to NGPA. After 1984, the change in the deficits would be minor, resulting in a cumulative \$8.2 billion reduction in the deficit over fiscal years 1984 to 1987. Under the low oil price scenario, the budgetary picture would not improve as much as the fiscal year 1984 deficit declined by \$1.4 billion and the cumulative deficit from 1984 to 1987 declined by \$2.0 billion.

Under the high oil price scenario and complete decontrol, the reductions in real gross domestic product and natural gas demand would be substantially larger than those presented above for the NGPA base case. On the other hand, the results for the low oil price scenario indicate very small macroeconomic adjustment costs with the complete decontrol option. These sensitivity results strongly suggest that the condition of world oil markets should be a primary consideration in any future debate concerning natural gas decontrol. If oil prices continue to be soft through 1984, then complete decontrol would entail very small macroeconomic adjustment costs and a slight decrease in budget deficit. Complete decontrol combined with high oil prices, however, would lead to stagflation.

Partial Decontrol in 1984

The sensitivity of the major economic variables and budgetary effects resulting from partial decontrol is presented in Table 16. The partial decontrol option with higher oil prices would result in a 0.2 percent decline in output and a 0.9 percent increase in prices in 1984. As expected, the reductions in natural gas demand would also be larger than under the base oil price scenario. The net budgetary effect in 1984 would be a \$2.8 billion reduction in the deficit. The cumulative effect would be a \$0.2 billion dollar increase in the budget deficit over fiscal years 1984-1987.

TABLE 15. SENSITIVITY OF OUTPUT, INFLATION, NATURAL GAS DEMAND, AND NET BUDGETARY EFFECT TO OIL PRICE CHANGES UNDER COMPLETE DECONTROL IN 1984; CHANGES FROM THE NGPA BASE CASE (By calendar year)

Variable	1984	1985	1986	1987
<u>Low Oil Price Scenario</u>				
Real Gross Domestic Product (GDP) (percent change)	-0.10	0.03	0.04	0.03
GDP Price Deflator (percent point change)	0.40	-0.20	0.00	0.00
Natural Gas Demand (percent change)	-0.70	-0.20	0.40	0.50
Net Budgetary Effect a (by fiscal year, changes in billions of nominal dollars)	1.40	0.20	0.10	0.30

<u>High Oil Price Scenario</u>				
Real Gross Domestic Product (GDP) (percent change)	-0.60	-0.04	0.07	0.03
GDP Price Deflator (percent point change)	2.10	-0.94	0.02	0.02
Natural Gas Demand (percent change)	-5.00	-3.70	-2.93	-2.81
Net Budgetary Effect a (by fiscal year, changes in billions of nominal dollars)	7.00	0.90	-0.20	0.50

a. Positive numbers indicate a reduction in the deficit; negative numbers indicate an increase.

TABLE 16. SENSITIVITY OF OUTPUT, INFLATION, NATURAL GAS DEMAND, AND NET BUDGETARY EFFECT TO OIL PRICE CHANGES UNDER PARTIAL DECONTROL IN 1984; CHANGES FROM THE NGPA BASE CASE (By calendar year)

Variable	1984	1985	1986	1987
<u>Low Oil Price Scenario</u>				
Real Gross Domestic Product (GDP) (percent change)	-0.02	0.02	0.02	0.02
GDP Price Deflator (percent point change)	0.10	-0.10	0.00	0.00
Natural Gas Demand (percent change)	-0.10	0.20	0.20	0.30
Net Budgetary Effect a (by fiscal year, changes in billions of nominal dollars)	0.40	0.00	0.00	0.10

<u>High Oil Price Scenario</u>				
Real Gross Domestic Product (GDP) (percent change)	-0.20	0.12	0.07	0.03
GDP Price Deflator (percent point change)	0.90	-0.80	-0.02	-0.02
Natural Gas Demand (percent change)	-2.40	-0.80	-0.30	-0.20
Net Budgetary Effect a (by fiscal year, changes in billions of nominal dollars)	2.80	-1.15	-1.24	-0.64

a. Positive numbers indicate a reduction in the deficit; negative numbers indicate an increase.

The effects of partial decontrol under the low oil price scenario would be insignificant. For example, the 1984 reduction in real gross domestic product would be 0.02 percent. The fiscal year 1984 deficit would decrease by \$0.4 billion. The cumulative change in net budgetary balance would be less than a \$1 billion dollar reduction in the deficit. The range of macroeconomic adjustment costs presented here provides more evidence to underscore the importance of oil prices. Nevertheless, the budgetary effects vary within a fairly narrow range under this option.

CHAPTER IV. SENSITIVITY OF DECONTROL EFFECTS TO FISCAL
AND MONETARY POLICY ASSUMPTIONS

The analysis to this point has assumed a completely accommodative monetary policy and maintenance of a real level for federal discretionary spending. This chapter examines the budgetary implications of decontrol assuming a tighter fiscal policy that would erode real federal discretionary spending and a more restrictive monetary policy that would result in higher interest rates. These new assumptions would increase the budgetary savings of complete decontrol from \$3.6 billion to \$4.6 billion in fiscal year 1984. In 1985, complete decontrol under these more restrictive policy assumptions would lead to a \$1.8 billion increase in the 1985 fiscal year deficit compared to a \$0.7 billion reduction under the base assumptions. Under these new assumptions, partial decontrol in 1984 would reduce the deficit by \$1.4 billion during fiscal years 1984 and 1985, as opposed to the \$0.6 billion reduction estimated under base assumptions. Thus, restrictive fiscal and monetary policies would not substantially change any net budgetary savings that could be realized from the decontrol of wellhead natural gas prices.

This chapter presents the key assumptions used to formulate the more restrictive fiscal and monetary policy assumptions and discusses the macroeconomic and budgetary implications of complete and partial decontrol under these alternative policy assumptions.

FORMULATION OF THE ALTERNATIVE FISCAL AND
MONETARY POLICY ASSUMPTIONS

Under the tighter fiscal policy assumed in this chapter, defense and nondefense discretionary spending would not be allowed to rise to offset inflation and maintain real levels. This policy assumption would have two effects on the budget. The first is direct and obvious--reduced outlays. The second effect is indirect and would lead to lower tax revenues since reduced government spending tends to reduce income and output in the general economy. Thus, the reduction in discretionary outlays might be partially offset by lower tax revenues.

The macroeconomic and budgetary effects of decontrol would depend on the response of monetary policy. In the period of economic adjustment to deregulation, the policy governing the available supply of money would be critical because of the relationship between gas prices and the demand for money.

If gas prices rose and prices for other goods failed to fall rapidly enough, then the level of prices for all goods in general would rise. In response to such an increase in the general price level, consumers might increase their demand for money rather than reduce their spending on other goods and services. If consumers increased their demand for money in this fashion, then the relevant question would be: would the Federal Reserve Board allow the money supply to grow to meet this demand?

According to traditional macroeconomic models, if the Federal Reserve Board held money aggregates constant, then higher interest rates would result. This would reduce economic growth and increase unemployment in the short term.

On the other hand, the Federal Reserve might accommodate the price increase by expanding the supply of money and avoiding the adverse economic effects of higher interest rates, but at the cost of higher inflation. There is considerable debate over this view, however. Some economists claim that more rapid money growth would lead to an increase in interest rates rather than averting it. This would occur if investors perceived a more rapid growth in money as a precursor to higher inflation. While this view may be correct, it has not been quantified in models that are available for the problems under investigation here.

In fact, most major macroeconomic models give sometimes conflicting results for alternative money growth scenarios. In many cases, these models must be "adjusted" in order to provide reasonable estimates for the sensitivity of macroeconomic variables to monetary policies. This study assumes that interest rates would rise or fall in direct proportion to the change in the demand for money. In other words, if higher prices caused the demand for money to increase by one percentage point and if the Federal Reserve Board reacted by reducing the money supply by an equal amount, then interest rates would increase by one percentage point. This assumption reflects the "traditional" perspective of monetary policy's effects described above. This method is based on model simulation results obtained from a separate study and represents a middle ground between results obtained from two major macroeconomic models. ¹ Since the inflationary effects of

1. The interest rate sensitivity to money growth used in this study is an average of the implied elasticities from the DRI and Wharton model simulations completed for "Three Large Scale Model Simulations of Four Money Growth Scenarios," a staff study for the Subcommittee on Monetary and Fiscal Policy of the Joint Economic Committee (September 1982).