

Combining Decontrol of Natural Gas with a New Tax on Producer Revenues

An issue frequently discussed in connection with the decontrol of natural gas is the imposition of a tax on the increased revenues of gas producers. The additional Federal revenues could, in theory, be used to reduce the Federal deficits projected for 1983 and 1984 or could even be earmarked for special purposes, such as the social security trust funds, to alleviate prospective deficits in the late 1980s. The Federal revenue impact of a new tax on decontrolled natural gas involves a number of factors that can easily be overlooked in a cursory discussion of the issue. The purpose of this note is to review these factors and to provide an analysis of the net revenue effects under two alternative scenarios for the response of natural gas prices to a law that (for the purposes of discussion) would lift all controls on January 1, 1983.

The analysis reveals that, if natural gas prices were gradually to respond to decontrol, the projected net revenue impact of combining decontrol with a new tax similar to the windfall profit tax on oil would be to increase Federal revenues by about \$1 billion in fiscal year 1983 and \$7 billion in 1984. This estimate assumes that gas prices would rise to the energy equivalent of residual fuel oil by the final quarter of calendar year 1984, eight quarters after price controls are lifted. If natural gas prices were to respond more rapidly, the revenue effect would be somewhat larger. For example, in the extreme case of an immediate or instantaneous jump in natural gas prices to the energy-equivalent fuel oil price, the projected revenue effect could be about \$12 billion in fiscal years 1983 and 1984.

The structure of a new tax

A Federal tax imposed in connection with rapid decontrol of natural gas could take many forms. Insofar as the basic structure is concerned, most analysts assume that a tax, if enacted, would be imposed on the difference between the price at the wellhead of decontrolled natural gas and some base price. However, in theory, a tax could be imposed in many different ways—including a tax on the total price of natural gas under decontrol or on the number of cubic feet produced. For the purposes of this analysis, we have assumed the tax would be applied at the wellhead to the difference between the price of gas under decontrol and a projection of gas prices in 1983 and 1984 under current law.

Once the basic structure of the tax is determined, numerous other details must be decided such as the tax rate(s), the deductibility of certain expenses such as state severance taxes, and the conditions for exemption from the tax. Some of these questions would clearly be major items of dispute if the Congress were to act on a tax, and there is no way to forecast the precise nature of the legislative compromises that are likely to evolve as a result of the debate. In general, most analysts have assumed a tax would be modeled on the windfall profit tax on crude oil. The basic thrust of that tax—from the standpoint of the revenue impact—was simple:

- There were alternative tax rates for various categories of newly discovered and previously discovered oil, ranging from 30 percent to 70 percent. The rates varied not only with the

type of oil but also with characteristics of the producer. For independent producers (typically producers not involved in refining or retailing), the tax rates were generally lower. The average of the various rates appears to be about 50 percent.¹

- State severance taxes on the difference between the price of decontrolled oil and a base price were deductible from the amount of producer revenue subject to tax, and the windfall profit tax itself was a deductible expense for the computation of corporate income tax.
- Oil produced on certain Indian and Alaskan lands and on certain properties held for charitable and public purposes was exempt from the tax and, under recent changes, independent producer stripper production (oil from a property from which average daily production has been ten barrels or less for any consecutive twelve-month period after 1972) will be exempt after December 31, 1982.

The calculations in this analysis assume an average tax rate on all categories of natural gas production of 50 percent. From the standpoint of formulating a specific tax law, the applicable tax rates are an important question. However, even if the tax were to have different rates for different categories of gas, it still could be converted for estimating purposes into an equivalent tax with a single average rate.

We have assumed state severance taxes on the difference between the decontrolled and base prices would be a deductible expense for the purposes of computing a new Federal tax on the increased producer revenues. For the purposes of this analysis, state severance taxes have been assumed to equal 5.5 percent of the increased producer revenues.² Finally, the volume of gas produced on Alaskan and Indian lands is negligible, so that an assumed exemption has no effect on the revenue estimates. No other exemptions were assumed.

¹ See Carol Belal and Phil Clark, "Windfall Profit Tax Liability for 1980", *Statistics of Income Bulletin* (United States Treasury, Fall 1981)

² In particular, we have assumed an average state severance rate of 7 percent (The current average is somewhat smaller, but pending legislative changes in Louisiana where a proposal to shift from a tax on the volume of gas produced to the value of gas produced would raise the average.) The assumed 5.5 percent deduction reflects the fact that natural gas production on outer continental shelf lands (approximately 20 percent of United States production) is not subject to state severance taxes

The total Federal revenues from a tax on decontrolled natural gas will depend primarily on how the market price of gas behaves following decontrol and to a lesser extent on how the overall economy behaves. A faster rise in the price of gas after decontrol means greater revenues. In addition, as the economy adjusts to higher gas prices, indirect effects on the overall price level and on real economic activity may result in changes in nominal incomes that would affect projected corporate and individual income tax collections. A potential third factor is the volume of gas produced. However, as discussed in the preceding article by Bennett and Kuenstner, major shifts are unlikely in the short period (1983-84) covered by the revenue estimate in this analysis. The discussion that follows will focus first on the direct Federal revenue effects of a new tax under two alternative scenarios for the response of natural gas prices to complete decontrol on January 1, 1983. The indirect revenue effects that could result from changes in the general price level and in real economic activity will then be discussed. Estimates of the direct and indirect effects will then be summed to arrive at an estimate of the projected net Federal revenue impact. Finally, the possible revenue effects for 1985 and beyond will be discussed briefly.

Gas prices and direct revenue effects

An estimate of the net revenue effect of a new tax on decontrolled natural gas must necessarily begin with the estimated increase in producer revenues, which in turn is based on projected gas prices. Clearly, there is considerable uncertainty about the effect of decontrol on gas prices. For the purposes of analysis, two alternative scenarios have been constructed. The "gradual response scenario" assumes that, after decontrol, gas prices would increase steadily but gradually so that wellhead prices would reach the energy equivalent of residual fuel oil prices by the eighth quarter after decontrol. As discussed in the accompanying article by Bennett and Kuenstner, the gradual response scenario may result from the existence of long-term contracts, uncertainty and inertia among fuel users and suppliers, and the existence of plentiful stocks. A more rapid response could occur if electric utilities and large industrial users with dual-fired capacity were to bid up the price of gas after price restrictions and fuel use restrictions were eliminated. The "immediate response" alternative represents an extreme assumption for this more rapid response, with gas prices instantaneously jumping to the energy equivalent of residual fuel oil.

Under current law, gas prices have been projected to rise from \$1.79 per thousand cubic feet (mcf) in the

Table 1

Projected Natural Gas Prices

In dollars, per thousand cubic feet

Calendar year and quarter	Current law		Decontrol		Decontrol	
	Real*	Nominal	Gradual response		Immediate response	
			Real	Nominal	Real	Nominal
1981 - II	1 79	1 79	1 79	1 79	1 79	1 79
1982 - IV	2 14	2 39	2 14	2 39	2 14	2 39
1983 - I	2 20	2 48	2 32	2 61	4 20	4 72
1983 - II	2 26	2 58	2 53	2 88	4 20	4 79
1983 - III	2 33	2 69	2 75	3 18	4 20	4 85
1983 - IV	2 40	2 81	2 99	3 50	4 20	4 91
1984 - I	2 47	2 91	3 26	3 84	4 20	4 95
1984 - II	2 55	3 04	3 54	4 22	4 20	5 00
1984 - III	2 62	3 15	3 86	4 65	4 20	5 06
1984 - IV	2 70	3 29	4 20	5 11	4 20	5 11
Fiscal 1983	2 23	2 54	2 44	2 76	3 69	4 18
Fiscal 1984	2 51	2 98	3 41	4 05	4 20	4 98

* Expressed in 1981 - II dollars

second quarter of calendar year 1981 to \$3.29 in the fourth quarter of 1984.³ For the gradual response scenario, prices begin to rise above the current law projection starting in the first quarter of calendar year 1983 and eventually reach the energy-equivalent price of residual fuel oil, or \$5.11 per mcf, in the fourth quarter of 1984. For the immediate response scenario, the price of gas is assumed to jump to the projected energy-equivalent price of residual fuel oil in the first quarter of calendar year 1983—or \$4.72 per

mcf—and then to remain constant in real terms thereafter (Table 1).

Assuming production of 20 billion mcf per year, the projected increases in producer revenues in fiscal years 1983 and 1984 because of decontrol are \$4 billion and \$21 billion under the gradual response scenario and \$33 billion and \$40 billion under the immediate response scenario. The deductibility of state severance taxes reduces the producer revenues subject to the hypothetical 50 percent gas tax. As shown in Table 2, the direct revenue effects would be \$2 billion in 1983 and would rise to \$10 billion in 1984 under the gradual response scenario. An instantaneous jump in prices would result in greater direct revenues—\$16 billion in 1983 and \$19 billion in 1984.

Decontrol, the economy, and Federal revenues

Some advocates of decontrol have suggested that even without a new tax, the decontrol of natural gas will lead to a significant increase in Federal revenues since the gas producers who would be receiving higher prices face a 46 percent marginal tax rate on the additional corporate profits. However, this suggestion reflects only a partial analysis of the near-term economic effects of decontrol, implicitly leaving other incomes unchanged. The ultimate outcome with respect to total incomes and revenues may be considerably more complicated.

³ The wellhead price for the end of 1984 under continued controls was assumed to be \$2.70 per million British thermal units (mmbtu) in 1981 dollars. This figure was derived from an estimate by ICF, Inc., A *Preliminary Analysis of the Gas Cushion*, page 11, which was adjusted by assuming production of one quadrillion btu's of high-cost gas at \$6 per mmbtu. For the late 1984 wellhead price under decontrol, a residual oil price to electric utilities of \$5.40 per mmbtu (the average for January 1981) was assumed, and a wellhead-to-user mark-up of \$1.16 was projected using the difference between actual midyear delivered gas prices and wellhead prices. Subtracting the mark-up from the residual oil energy price gave a wellhead price of \$4.20 per mmbtu (in 1981 dollars), just over \$1.50 per mmbtu higher than under continued controls. The data for these calculations came from the *Monthly Energy Review* (November 1981). An analogous calculation with data from the American Gas Association, *Gas Facts, 1980 Data*, on wellhead prices and delivered prices to industrial and electric utility users, as well as a slightly higher residual price appropriate to this broader sector, gave a late 1984 price gap just under \$1.50 per mmbtu (in 1981 dollars). Inflation was assumed to be 7.7 percent in 1982, 5.5 percent in 1983, and 4.4 percent in 1984. This put the \$1.50 in 1981 dollars equivalent into a projected actual current gap of \$1.80 in current dollars at the end of 1984.

The increase in gas prices would exert upward pressure on the price level, especially if an increase in inflationary expectations were to result. On the other hand, other factors such as the effects of monetary restraint, the lower profits of industries that currently use natural gas, and the lower real disposable income of consumers might lead to a lower level of real gross national product (GNP) than would have been the case in the absence of decontrol. The size and net result of these secondary economic effects represent a major question in estimating revenues, since nominal incomes—ultimately nominal GNP—represent the major determinant of individual and corporate tax collections.

Secondary economic effects are relevant not only for the question of estimating revenues without a new tax on natural gas but also for estimates of the net revenue impact of a new tax. In this analysis, as in the windfall profit tax on oil, it has been assumed that a new tax on the producer revenues resulting from decontrol would be a deductible expense for the purposes of computing Federal corporate tax liability. Consequently, if decontrol results in simply a redistribution of aggregate nominal incomes (particularly corporate profits) rather than an increase in the overall levels, then the net revenue effect of the tax would include a reduction of other Federal revenues because of the deductibility of the new tax.

Two extreme assumptions could be made about the effects of gas decontrol on nominal GNP:

- In the first case, the secondary effects could be assumed to be negligible. In this instance, corporate profits would increase by the difference in prices (between the current law and decontrolled cases) multiplied by the volume of gas produced. If this were—hypothetically—\$1 billion, then corporate profits taxes could be expected to increase by \$0.46 billion without a new tax. With a 50 percent tax, the revenues from the tax would be \$0.5 billion and corporate profits taxes would increase by \$0.23 billion, because of the \$0.5 billion (net) increase in corporate profits. The total Federal revenue impact would be an increase of \$0.73 billion.
- An alternative assumption would be that nominal GNP would remain unchanged as a result of gas decontrol, with the increase in prices being offset by lower real output. In this instance, a \$1 billion increase in producer revenues would result in essentially no net change in Federal tax revenues in the absence of a new tax. With a 50 percent tax, the direct rev-

enues from the new tax would be \$0.5 billion, but corporate profits taxes would be reduced by \$0.23 billion (46 percent of \$0.5 billion) because of the deductibility of the gas tax, for a net Federal revenue increase of \$0.27 billion.

In the past, Treasury revenue estimates and Congressional revenue estimates made by the staff of the Joint Committee on Taxation (JCT) have made the latter (static income) assumption. For example, the JCT revenue estimate for the oil windfall profit tax contained cumulative tax liabilities of \$410.5 billion in 1979-90 from the tax but a reduction in other tax liabilities of \$182.8 billion (44.5 percent of \$410.5 billion) because of the deductibility of windfall profit tax payments from income.⁴

The size of the indirect effects

The magnitude of the secondary effects is primarily an empirical question and depends on a number of factors. Also, the lags involved in estimating the effects on the general price level and on real activity are varied and complex. To obtain an approximation of these effects three experiments were run on a large-scale econometric model, the Federal Reserve-MIT-Penn (FMP) model. The three experiments represented a baseline projection for current policies and projections of the two alternative scenarios for gas prices under full decontrol that were discussed previously. For the three experiments the same money growth assumption was used.

Under the gradual response scenario, the estimated effect of decontrol on nominal GNP (the critical variable for estimating Federal revenues) is negligible for fiscal year 1983, an increase of less than $\frac{1}{10}$ percent. Slightly higher prices, compared with the baseline projection, are offset by lower economic growth. In fiscal year 1984, nominal GNP is higher by $\frac{2}{10}$ percent. Under the immediate response scenario, nominal GNP is higher than the baseline projection by $\frac{5}{10}$ percent for fiscal year 1983. In 1984, the increase is only $\frac{3}{10}$ percent, primarily because of the lagged effects on real activity, as shown below:

Fiscal year	Gradual response			Immediate response		
	Nominal GNP*	Real GNP*	Federal revenues†	Nominal GNP*	Real GNP*	Federal revenues†
1983 ...	—	—	—	+0.5	-0.5	+3.8
1984...	+0.2	-0.4	+1.9	+0.3	-1.4	+2.2

* In percent † In billions of dollars

⁴ See the Conference Report on the Crude Oil Windfall Profit Tax Act of 1980.

The net revenue effect of a tax on decontrolled natural gas

The net revenues resulting from a tax on decontrolled natural gas includes both the direct and indirect effects. The direct effects under the two price scenarios were already discussed and shown in Table 2. Indirect effects can be decomposed into the effect of the deductibility of a new tax, assuming no change in nominal GNP, and the effects on corporate and individual tax collections of the projected changes in GNP resulting from decontrol.

As shown in Table 3, the deductibility of the new tax would result in a reduction in taxes of \$1.0 billion in 1983 and \$4.6 billion in 1984 under the gradual response scenario and more substantial reductions under the immediate response scenario. The Treasury and JCT estimating approach would combine these projected reductions with the estimate for direct revenues to arrive at a net Federal revenue impact of \$1 billion in 1983 and \$6 billion in 1984 under the gradual response scenario. The comparable figures under the immediate response scenario would be \$8 billion in 1983 and \$10 billion in 1984.

Another indirect effect, however, might be considered—namely, the revenue effect of a somewhat higher nominal GNP induced by the somewhat higher near-term price levels resulting from decontrol. As shown in Table 3, if this additional indirect effect is taken into account, the net increase in revenues under the gradual response scenario is still about \$1 billion in 1983 and is raised to about \$7 billion in 1984. Including the indirect effects of decontrol on nominal GNP and incomes means that the combined net Federal revenue impact of decontrol and a new tax could be as much as \$12 billion in 1983 and in 1984 under the more extreme immediate response scenario.

It should be noted that it is only appropriate to include the second indirect effect if the alternatives to be considered are current law versus both gas decontrol and a new tax. If the economic effects of decontrol are included in the baseline economic scenario because a decision for decontrol were assumed to have already been made, then the alternatives would be a new tax or no new tax (with decontrol assumed for both alternatives). To be more specific, if the Administration were to propose decontrol without a tax, then the economic effects of decontrol shown in the "Revenue effect of higher GNP" (Table 3) would already be included in the estimates of individual and corporate taxes. If the Congress were then to initiate a new tax, the appropriate estimate of the revenue impact of the tax would be the estimate using the Treasury-JCT method.

Table 2

Estimate of the Direct Revenue Effects of Gas Decontrol

By fiscal years, in billions of dollars

Item	1983	1984
Gradual price response scenario		
Producer revenues	4.4	21.4
State severance tax deduction (5.5%)	-0.2	-1.2
Gas tax base	4.2	20.2
Direct Federal revenues (50%)	2.1	10.1
Immediate price response scenario		
Producer revenues	32.8	40.0
State severance tax deduction (5.5%)	-1.8	-2.2
Gas tax base	31.0	37.8
Direct Federal revenues (50%)	15.5	18.9

Table 3

Estimate of the Revenue Effects of Gas Decontrol

By fiscal years, in billions of dollars

Item	1983	1984
Gradual price response scenario		
Producer revenues	4.4	21.4
State severance tax deduction (5.5%)	-0.2	-1.2
Gas tax base	4.2	20.2
Direct Federal revenues (50%)	2.1	10.1
Indirect effect of deductibility on other taxes	-1.0	-4.6
Net Federal revenue impact (Treasury-Joint Committee on Taxation method)	1.1	5.5
Revenue effect of higher GNP	—	+1.9
Net Federal revenue impact	1.1	7.4
Immediate price response scenario		
Producer revenues	32.8	40.0
State severance tax deduction (5.5%)	-1.8	-2.2
Gas tax base	31.0	37.8
Direct Federal revenues (50%)	15.5	18.9
Indirect effect of deductibility on other taxes	-7.1	-8.7
Net Federal revenue impact (Treasury-Joint Committee on Taxation method)	8.4	10.2
Revenue effect of higher GNP	+3.8	+2.2
Net Federal revenue impact	12.2	12.4

1985 and beyond

The revenue effects of a tax after 1984 depend on the structure of the tax and possibly on an estimate of what would happen to gas prices when, under current law, some gas prices are decontrolled. As discussed in the accompanying article by Bennett and Kuenstner, the prices of those categories of natural gas that will be decontrolled under current law may escalate greatly and rapidly in 1985. Within a short time after the start of 1985, average gas prices under current law could be approximately equal to the average prices that would be in effect if all gas prices were decontrolled two years earlier, at the start of 1983. If this were the case, then revenues from a tax on producer revenues that was

based on the difference between gas prices under de-control and prices under current law could decrease dramatically in 1985, phasing down to virtually zero in 1986. On the other hand, the tax on producer revenues after 1984 could be keyed to an extrapolation of the pre-1985 controls path, for the purpose of computing tax liability. However, as shown in Table 1, even the price path under controls rises substantially in real terms. An extrapolation of the price path in Table 1 reaches oil equivalence by the end of 1987. Consequently, if the tax were keyed to such an extrapolation, Federal revenues could be expected to peak in fiscal year 1984 and then decrease to approximately zero by fiscal year 1988.

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