
Natural Gas Price Controls

An Alternative View

William A. Niskanen

SINCE THE 1954 U.S. Supreme Court decision in *Phillips Petroleum Co. v. Wisconsin*, the wellhead prices of natural gas sold in interstate commerce have been regulated by the Federal Power Commission, now the Federal Energy Regulatory Commission (FERC). Interstate natural gas pipelines also are regulated by FERC, and local natural gas distribution companies are regulated by the state utility commissions.

For nearly two decades following the *Phillips* decision, these regulations did not create unusual problems because the prices of competing fuels, primarily oil, were fairly stable. Following the rapid increase in the price of oil beginning in the early 1970s, however, the price controls on natural gas created occasional shortages. Industrial use was sometimes curtailed, and many potential users were restricted to using other fuels. An unusually cold winter in 1977 caused a severe shortage in interstate markets.

These conditions led Congress to approve the Natural Gas Policy Act (NGPA) in 1978. This act was designed both to encourage the production of new gas and to restrain the increase in the prices of delivered gas. More than 20 categories of regulated gas were established, each with its

own initial price and rules for price escalation. A small amount of high-cost new gas (discovered after 1977) was deregulated in 1979. Most new gas was subject to phased deregulation, with full deregulation occurring for most new gas in 1985 and a smaller amount in 1987. Old gas was subject to permanent controls, with ceiling prices adjusted for inflation but not for the prices of competing fuels. Wellhead price controls also were extended to natural gas sold in intrastate markets. Another 1978 act authorized nonprice rationing to utilities and industrial users.

The NGPA, although unduly complicated, would have resolved many of the problems of the natural gas market if not for the second major increase in oil prices in 1979 and 1980. The ceiling prices for old gas, based on the new oil-equivalent price in 1978, quickly became too low to clear the natural gas market. In response to the increased demand for gas, pipelines paid much higher prices for new gas than the average price under existing contracts. In subsequent years, the prices paid for new gas also have been highly variable, first increasing rapidly and recently declining to a level roughly equal to the average price under existing contracts.

What explains these unusual conditions in the U.S. market for natural gas in recent years?

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The Conventional Explanation

Most analysts of this market have attributed these conditions to the pricing rule by which the gas pipeline and distribution companies are presumably regulated. The delivered price of gas,

according to this rule, is equal to the average price of purchased gas plus the charge for transportation and distribution, a charge that is regulated by conventional rate-of-return criteria. Analysts who share this perspective, in turn, attribute substantial inefficiencies to such "rolled-in" or average-cost pricing. For example, FERC (in a 1985 proposed rulemaking) concluded: "Rolled-in pricing promotes inefficiency in consumption and production . . . [because] the price signal to consumers does not represent the resource cost of bringing additional supplies to the market," and "...rolled-in pricing has contributed to the wide swings, from natural gas shortages in the 1970s to the surplus in the 1980s."

A 1985 study by the American Enterprise Institute concluded:

... rolled-in pricing distorts the economic signals to both consumers and producers. Even though the value of each unit of gas consumed is the resource cost of *currently replacing* that unit, the consumer sees a price composed simply of the average of a set of historical contracts. Producers see even more distorted prices. Price-controlled gas is underpriced (suppressing supply), while the remainder, as a direct consequence of the regulatory system, is overpriced (generating investment in production of gas that is not worth the expense) Under rolled-in pricing, pipelines with a large cushion of underpriced natural gas have a competitive advantage over other, small-cushion pipelines (including intrastates), an advantage that seems in part fortuitous.

Similarly, the 1983 *Annual Report of the Council of Economic Advisers* (in a section that I supervised and reviewed) assumed that "The price of decontrolled gas is averaged with the price of controlled gas in determining the price to natural gas users" This conventional perspective led the CEA to state:

Interstate pipelines . . . will vary in their ability to bid for decontrolled gas, depending on their access to controlled gas and the actions of the local regulatory authorities [P]artial decontrol will generate a continued increase in delivered-gas prices in 1985 as consumers bid up natural gas prices to levels equivalent with those of close substitutes such as oil.

These and other analyses assume that the average-cost pricing rule for delivered gas, in conjunction with the FERC ceilings on the wellhead prices of old gas, led the pipeline and distribution companies to maintain an artificially low price of delivered gas and to bid up the prices of purchased new gas. The conventional explanation of these conditions—by both government and private analysts—is plausible, disturbing, and broadly shared.

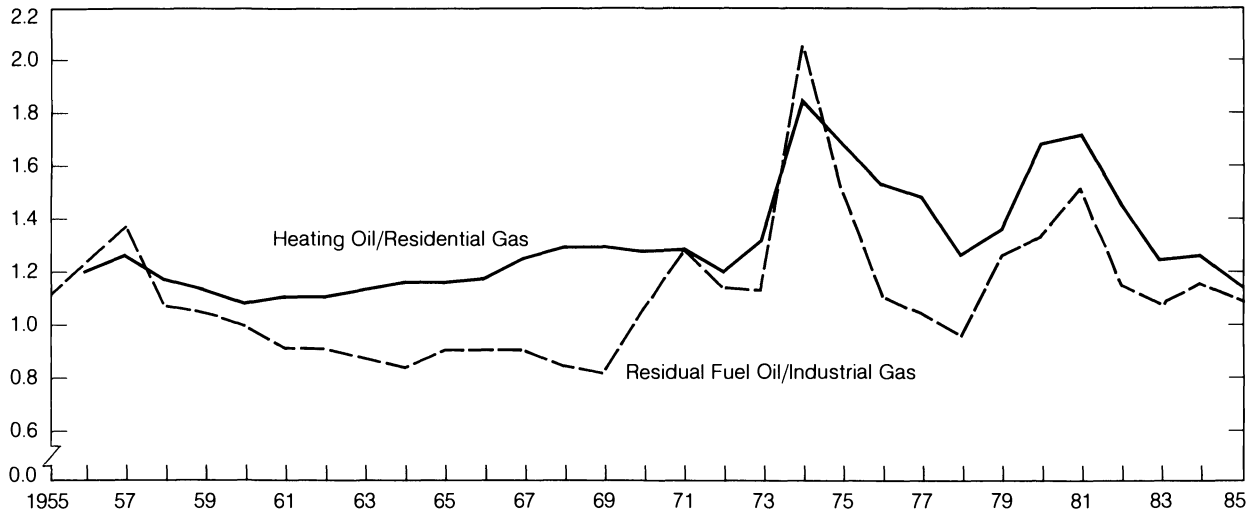
An Alternative Explanation

The same conditions, however, also are consistent with an alternative explanation, one with very different policy implications. This explanation attributes the higher prices in new contracts to an expectation that delivered prices will be higher in the future, and the variation in these prices to changes in these expectations.

A number of conditions contribute to the plausibility of this alternative explanation. First, this explanation, in contrast to the conventional explanation, is more consistent with profit maximizing by the pipelines. In a competitive market, price tends to equal marginal cost. For an unregulated profit-maximizing monopolist, price is higher than marginal cost. In the absence of effective regulation, a profit-maximizing pipeline would not pay higher prices under new contracts than the prices at which it expects to sell the natural gas over the period of the contract. The conventional explanation, in contrast, assumes that regulation of delivered prices leads the pipelines to dissipate the profits on their contracts on low-price old gas by reducing the price of delivered gas and by overbidding for new gas. Although the pipelines are presumably regulated to provide natural gas on an average-cost basis, they are likely to seek ways, such as by increasing their capital, to price on a basis more consistent with higher long-term profits. One should not be surprised that FERC assumes pipelines price on an average-cost basis; any other assumption would raise questions about the effectiveness of its regulation. However, the casual assumption by independent analysts that delivered-gas prices are based on average cost is less forgivable.

Second, there is ample evidence that, until recently, the future price of natural gas was expected to be higher than the current price. These expectations were based on the oil shocks of 1974 and 1979-80 and the expected effect of the

Figure 1
RATIO OF OIL TO GAS PRICES



Sources: Department of Energy, *Monthly Energy Report*, American Gas Association, *Gas Facts*.

decontrol of most new gas in 1985. For example, a 1982 study by the Department of Energy (DOE) estimated that the partial decontrol authorized by the NGPA for 1985 would increase the price of gas 28 percent, to \$3.78 per thousand cubic feet (in 1982 dollars). The level and variation in the price of new contracts over the past decade may have been consistent with the variations in the expected future prices during this turbulent period. The observation that the price of new contracts for firm natural gas is now about equal to the average price under prior contracts suggests that, for the first time in a decade, future gas prices are not expected to be higher than the current price.

The Evidence

A choice between these two explanations should not be made merely on the basis of their plausibility. An examination of several types of evidence is necessary to discriminate between these explanations. For this purpose, three types of evidence are examined: the price of delivered gas over time; the price of new gas purchased by pipelines; and the pipeline and distribution margin over time.

Did regulation reduce the price of delivered natural gas to consumers? An increase in oil prices would increase the ratio of oil-to-gas prices if delivered-gas prices are based on average cost. Conversely, this ratio should be roughly

stable under the alternative explanation. The pattern of the ratio of oil-to-gas prices over time therefore provides a useful test of these two explanations. Figure 1 displays these ratios for both residential and industrial consumers. (The solid line is the ratio of the price of Number 2 heating oil to the average delivered price of natural gas to residential consumers. The dashed line is the ratio of the price of Number 6 residual fuel oil to the average delivered price of natural gas to industrial consumers. Both price ratios are expressed in terms of equivalent BTUs.) This graph indicates that the ratio of oil-to-gas prices increased temporarily during the two oil shocks but declined to the prior level within a few years. The ratio of oil-to-gas prices, for example, was about the same in 1973, 1978, and 1983 even though the real price of oil more than doubled over this period. Controls on the wellhead price of old natural gas and regulation of the pipelines and distribution companies apparently had only a temporary effect on delivered-gas prices. Another indication that gas prices, over time, increased to clear the market is that there has been no extended natural gas rationing on a nonprice basis. The delivered price of gas appears to be determined primarily by the price of oil. The regulation of gas prices, contrary to the intent of Congress, does not appear to have generated any long-term benefits to consumers.

Did regulation increase the price of new gas purchased by pipelines? Pipelines with a larger amount or a lower price of old gas would

be willing to pay more for new gas if delivered-gas prices are based on average cost. As expressed by FERC: "[T]he unlevel playing field that results from rolled-in pricing would promote market raiding not by pipelines that are inherently more efficient but [by those] that have access to greater volumes of price-controlled gas." With strict average-cost pricing, the premium that would be paid for new gas is equal to the difference between the average cost and the price of old gas, multiplied by the ratio of the volumes of old to new gas. In other words, the premium would be equal to the amount of the old-gas "cushion" per unit of new gas. Conversely, the price of new gas among pipelines would be roughly independent of the pipeline's old-gas cushion under the alternative explanation.

A test of these two explanations requires an examination of the price of new gas purchased by pipelines. An examination of this issue in 1982 by the DOE found that "although companies with a substantial supply of inexpensive old natural gas might be expected to bid aggressively for high-cost gas, the data do not indicate that this has been happening." This study concluded that "the companies that projected large purchases of high-cost natural gas tend to be those that have increased their reserve inventories over the past few years. Additionally, large purchases of high-cost natural gas are associated with large purchases of [lower-price] new gas, suggesting a general strategy of reserves acquisition." The results of this study are clearly inconsistent with the conventional explanation.

My own examination of this issue was based on the purchased-gas adjustment filings by the 25 major interstate pipelines in late 1984 and early 1985. This examination indicates that the variation in the price of new gas purchases among pipelines was substantially less than would be expected based on average-cost pricing and was independent of the price of their old gas. On net, the available evidence suggests that pipelines with a large cushion of old gas may have gained substantial rents during the period of increasing oil prices. But the prices they paid for new gas, although higher than the current price of delivered gas, were independent of this cushion. This finding is also inconsistent with the conventional explanation.

Who captured the rents? The increase in the delivered price of gas created substantial rents to pipelines and gas distribution companies

that had firm contracts for the supply of old gas at the ceiling prices. The conventional explanation assumes that these rents were dissipated by maintaining lower prices for delivered gas and by paying higher prices for purchases of new gas; in this case, the pipeline and distribution charges would be independent of the wellhead prices of gas. Conversely, the sum of these charges would increase with the wellhead price under the alternative explanation.

The relation between oil and delivered-gas prices, as discussed above, suggests that the pipelines and distribution companies did not pass these rents forward to natural gas consumers. Similarly, the price of gas purchased by the pipelines suggests that these rents were not passed backward to the producers of new gas. In that case, the pipelines and distribution companies must have retained most or all of the rents from the price ceilings on old gas. These rents may not be fully reflected in the reported profits of these companies; some part of these rents may have been spent for additional capital or higher costs for other inputs.

It is also useful to examine the relation between the downstream margin (the sum of the pipeline and distribution charges) and the average wellhead price for direct evidence of this conclusion. Figure 2 displays this relation. These patterns indicate that the combined pipeline and distribution margin increased sharply beginning in 1974 and was related closely to the increase in the average wellhead price.

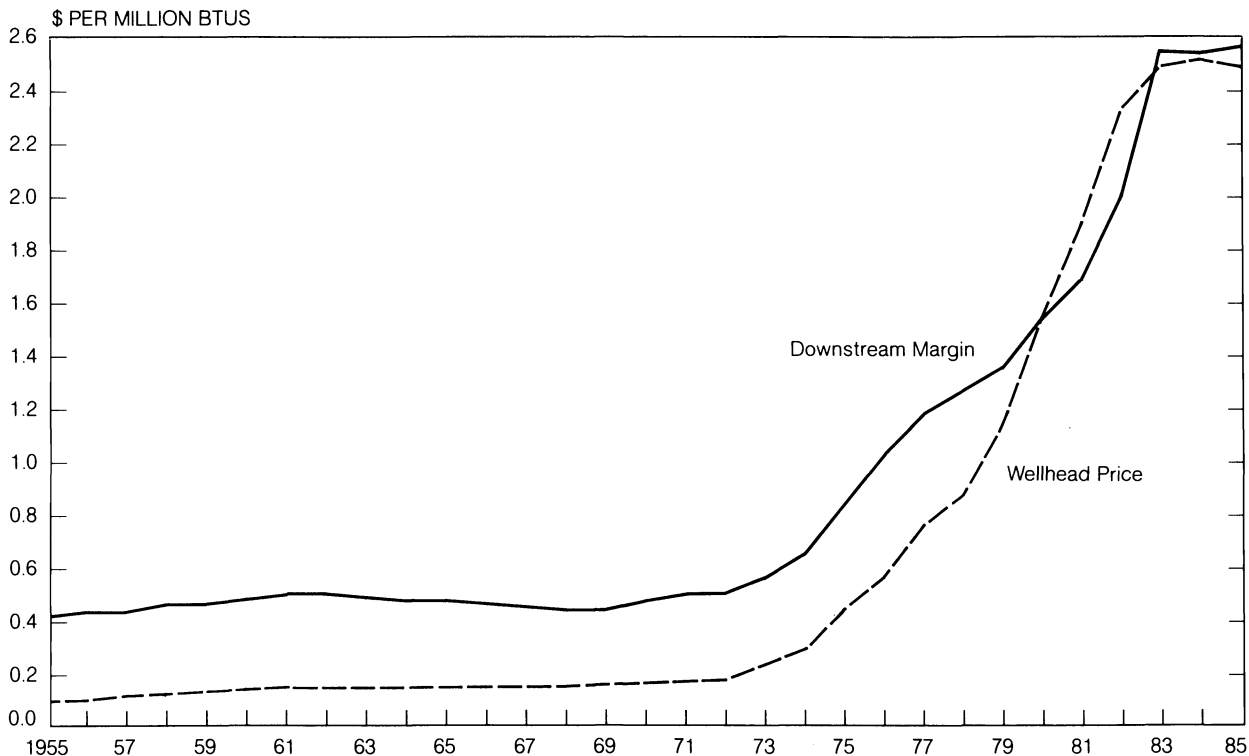
These several types of evidence suggest that the regulators of the pipelines and distribution companies were not effective in enforcing a rolled-in pricing rule and, separately and in combination, are much more consistent with the alternative explanation.

Policy Implications

The FERC and other analysts of the natural gas industry, by assuming that regulation of the pipeline and distribution companies leads to average-cost pricing, perceive a problem that may not exist. Consistent with the alternative explanation, the larger body of evidence leads to very different conclusions:

- The prices faced by both consumers and producers of new gas, given current expectations about future prices, were roughly correct.

Figure 2
DOWNSTREAM MARGIN VS WELLHEAD PRICE



Source: American Gas Association, *Gas Facts*.

- Price controls did not appreciably lower the delivered price to consumers or raise the price on new contracts to producers. The pipelines and distribution companies captured most of the rents from the controls on the price of old gas.

- After the fact, it appears that pipelines paid more for new gas than the price at which it could be sold over time, but this was not due to average-cost pricing.

- The “playing field” is already level. In other words, pipelines pay roughly the same price on new contracts regardless of the amount of their cushion of old gas.

My judgment is that the regulation of natural gas did not cause most of the mischief that the conventional explanation suggests. The regulators of the pipelines and distribution companies were apparently ineffective in enforcing a price of delivered gas based on average cost. The primary effect of the price controls on old gas was to shift the rents from the producers of old gas to the pipelines and distribution companies, and to foster the usual waste of resources to maintain these rents. A second effect of the price controls on old gas is that we risked losing a substantial

amount of this gas. An early 1985 DOE study estimated that the decontrol of old gas would increase the reserves of old gas between 27 trillion and 48 trillion cubic feet, equivalent to between 18 months and 32 months of U.S. consumption at the current rate. Thus, one effect of the controls on the prices of old gas was to reduce the amount supplied without reducing the price of delivered gas, a result that was presumably contrary to the intent of Congress.

For the moment, this problem is behind us. Following the sharp decline in oil prices in early 1986, FERC raised the price ceilings on all old gas to a common level somewhat above the current spot price. If this ruling is not overturned by Congress or the courts, the price of old gas will be effectively decontrolled—unless, of course, the market price again exceeds the new ceiling price. A 32-year period of misguided policy, beginning with the *Phillips* decision in 1954, may have been ended by this little-noticed ruling by the agency responsible for enforcing natural gas regulations. In retrospect, most of the analysts of this industry were correctly critical of this body of regulation—but apparently for the wrong reasons. ■