

Oil Price Controls: A Counterproductive Effort

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THE U. S. oil industry has been subjected to varying degrees of price controls since August 1971 when general price controls were levied on the entire U. S. economy. As controls were "phased-out" in other industries, more stringent price regulations were imposed on the oil industry in response to the October 1973 oil embargo and the subsequent quadrupling of world oil prices.

The oil price control program is directed at cushioning the domestic impact of sharply higher external oil prices. In this respect, the controls effort can be regarded as successful since the effective domestic price for petroleum remains, in fact, below world market prices. Economic analysis, however, indicates that the controls will (1) become ineffective, over time, with respect to the above stated intention and (2) will enhance the ability of external suppliers to manipulate prices.

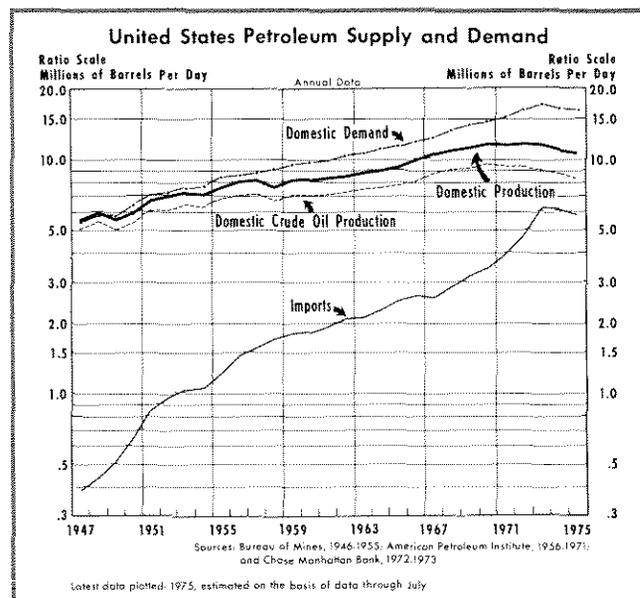
In support of these conclusions, this article includes a discussion of the mechanics of the controls program as it currently exists. Using economic theory as a foundation, the eventual effects of controls on domestic production, imports, and the domestic price of oil are derived. In this regard, two of the more popular questions regarding decontrol are analyzed — will decontrol result in (1) higher domestic petroleum prices and (2) increased domestic production and reduced imports?

BACKGROUND

As indicated in Table I, U. S. oil refiners currently process about 12.9 million barrels per day (MBD). Of this total approximately 4.7 MBD, or 36 percent, are produced abroad.

The United States did not always rely to such an extent on external oil supplies. In the mid-1960s oil imports represented only 20 percent of total U. S. consumption. In fact, as late as 1971 import quotas on petroleum products existed in order to prevent "cheap" foreign oil from placing domestic oil producers at a "competitive disadvantage".

Beginning in 1966, the rate of increase in domestic petroleum production began to decline, and in 1972 domestic petroleum production in the United States actually decreased from its 1971 level. Sev-



eral factors, including price controls and environmental and safety regulations, were responsible for increased U. S. reliance on foreign sources of supply.

OIL PRICE CONTROLS

Through a series of steps, the Federal Energy Administration (FEA) has decreed that "old" oil — that is, oil produced from domestic wells not exceeding the 1972 rate of output from these wells — can sell for no more than \$5.25 per barrel. As of March 1975, imported oil sold for \$13.28 and "new" domestic oil — that is, oil produced from both new wells and from old wells in excess of 1972 output — sold for \$11.47 per barrel (Table II).¹

In March 1975 (latest available data) total crude oil used by domestic refiners consisted of approximately 41 percent "old" domestic oil, 27 percent "new" domestic oil, and 32 percent imports. The effective domestic price paid by domestic refiners for a barrel of oil is simply the weighted sum of the three prices:

$$(0.41) \times \$5.25 + (0.27) \times \$11.47 + (0.32) \times \$13.28 = \$9.49$$

¹As indicated in Table II, petroleum price data are available through July 1975, but the proportions of "new" and "old" domestic production are only available through March. For the sake of data consistency, the analysis in this paper is based on the prices and relative proportions that prevailed in March 1975.

Table I

SOURCES OF CRUDE OIL TO DOMESTIC REFINERS

| | Total Crude Oil Input to Domestic Refiners ¹ (MBD) | Domestic Sources | | | | | Imports (MBD) |
|---------------|---|------------------|------------------|---------------------------|------------------|---------------------------|---------------|
| | | Total (MBD) | Old ² | | New ² | | |
| | | | MBD ³ | Percent of Total Domestic | MBD ³ | Percent of Total Domestic | |
| 1974 November | 12.455 | 8.458 | 5.667 | 67% | 2.791 | 33% | 3.997 |
| December | 12.450 | 8.471 | 5.591 | 66 | 2.880 | 34 | 3.979 |
| 1975 January | 12.608 | 8.644 | 5.014 | 58 | 3.630 | 42 | 3.964 |
| February | 12.549 | 8.488 | 5.178 | 61 | 3.310 | 39 | 4.061 |
| March | 12.186 | 8.333 | 5.000 | 60 | 3.333 | 40 | 3.853 |
| April | 11.983 | 8.567 | NA | NA | NA | NA | 3.416 |
| May | 11.957 | 8.464 | NA | NA | NA | NA | 3.493 |
| June | 12.251 | 8.344 | NA | NA | NA | NA | 3.907 |
| July | 12.641 | 8.304 | NA | NA | NA | NA | 4.337 |
| August | 12.909 | 8.238 | NA | NA | NA | NA | 4.671 |

¹Total Crude Oil Input to Domestic Refiners is the sum of total domestic and imported crude oil.

²The proportions of "old" and "new" crude oil are available only through March 1975.

³The quantities of "old" and "new" crude oil were derived from published data on total domestic production and the percentage breakdown between "old" and "new."

NA — Not Available

MBD — Million Barrels per Day

Source: Federal Energy Administration, *Monthly Energy Review* (October 1975).

Controls: The Mechanics

As gauged by this effective (weighted) domestic price equation for oil, the controls program has been successful; the average input price of oil available to domestic refiners is, in fact, lower than the world market price. Achievement of this lower average price, however, has resulted in at least two adverse developments:

(1) Domestic producers are discouraged from producing "old" oil, insofar as the implicit rate of return of keeping oil in the ground exceeds that of investing the proceeds from the current sale of oil at \$5.25 per barrel. For example, suppose domestic oil producers expect the price of "old" oil to eventually (say, in 39 months, as in recent proposals) rise to the price of uncontrolled oil. If it is assumed that the price of uncontrolled oil at that time will be about \$12.00 per barrel, then by keeping oil in the ground until expiration of controls a producer can realize an annual rate of return of about 29 percent² — a return which greatly exceeds current market yields. Under these conditions profit-maximizing domestic oil producers would reject the option of producing now

in favor of "holding back" until price controls are completely lifted.³

(2) Since some refiners have access to greater amounts of \$5.25 oil than other refiners, another wave of bureaucratic rules and regulations was deemed necessary to prevent some firms from having a government-mandated competitive advantage over other firms. The nature and extent of these regulations are discussed below.

Entitlements

With the implementation of domestic oil price controls, the FEA recognized that some refiners depended heavily, in the short-run, on relatively high cost foreign crude, while other refiners had access to comparatively large quantities of the cheaper domestic "old" oil. In an attempt to equalize input costs to all refiners, the FEA adopted the "Old Crude Oil Entitlement Program". This program is designed to allocate "old" oil proportionately among all refiners such that apparent cost differentials are reduced; that is, equalization of the average cost per barrel is promoted.

Each month the FEA calculates a national average ratio of "old" crude to total crude usage. On the

²This compounded annual rate of return was calculated using the following formula:

$$\left[\frac{\$12.00}{\$5.25} \right]^{1/39} - 1 \times 100 = 29 \text{ percent}$$

³This assumes that changes in taxes and depletion allowances are not expected.

Table II

AVERAGE CRUDE OIL PRICE TO DOMESTIC REFINERS

| | Old | | New | | Imports | | Effective Domestic Price per Barrel ¹ | Weighted Average Price of New & Imported Oil ² | Price of Entitlement |
|---------------|------------------|--------------------------------|------------------|--------------------------------|------------------|--------------------------------|--|---|----------------------|
| | Price per Barrel | Quantity as a Percent of Total | Price per Barrel | Quantity as a Percent of Total | Price per Barrel | Quantity as a Percent of Total | | | |
| 1974 November | \$5.25 | 45.5% | \$10.90 | 22.4% | \$12.53 | 32.1% | \$8.85 | \$10.25 | \$5.00 |
| December | 5.25 | 44.9 | 11.08 | 23.1 | 12.82 | 32.0 | 9.02 | 10.25 | 5.00 |
| 1975 January | 5.25 | 39.7 | 11.28 | 28.8 | 12.77 | 31.4 | 9.27 | 11.25 | 6.00 |
| February | 5.25 | 41.3 | 11.39 | 26.4 | 13.05 | 32.4 | 9.40 | 12.00 | 6.75 |
| March | 5.25 | 41.0 | 11.47 | 27.4 | 13.28 | 31.6 | 9.49 | 12.56 | 7.31 |
| April | 5.25 | NA | 11.64 | NA | 13.26 | 28.5 | NA | 12.54 | 7.29 |
| May | 5.25 | NA | 11.69 | NA | 13.27 | 29.2 | NA | 12.64 | 7.39 |
| June | 5.25 | NA | 11.73 | NA | 14.15 | 31.9 | NA | 13.07 | 7.82 |
| July | 5.25 | NA | 12.30P | NA | 14.03P | 34.3 | NA | 13.38 | 8.13 |
| August | 5.25 | NA | NA | NA | NA | 36.2 | NA | 13.56 | 8.31 |

¹The weighted average price is derived on the basis of the equation presented in this article.

²The weighted average price of "new" and imported oil represents the sum of the price for "old" oil and the price for an entitlement.

P—Preliminary

NA—Not Available

Source: Federal Energy Administration, *Monthly Energy Review*, and *Petroleum Situation Report*.

basis of this ratio, all refiners are issued entitlements to enable them to purchase "old" crude in the same proportion as the national average.⁴ For example, if total crude usage in the nation in any particular month consists of 41 percent "old" crude, then *each* refiner is "entitled" to purchase at least 41 percent of his input mix at the controlled price of \$5.25 per barrel, no matter where the oil actually comes from.

In principle, the refiner with access to less than the national average of "old" crude oil can present his entitlements to another refiner, who has more than the national average of "old" crude, in exchange for crude at a price of \$5.25 per barrel. In practice, however, the physical exchange of oil rarely takes place. Rather, the entitlements are bought and sold among refiners, with the price determined on the basis of the difference between the controlled and uncontrolled price of a barrel of oil.⁵ For example, in March the average price per barrel of "new" domestic and imported crude was \$12.56. Therefore, the FEA established an entitlement price of \$7.31 for that month. This is the price at which petroleum refiners exchanged entitlements in March.

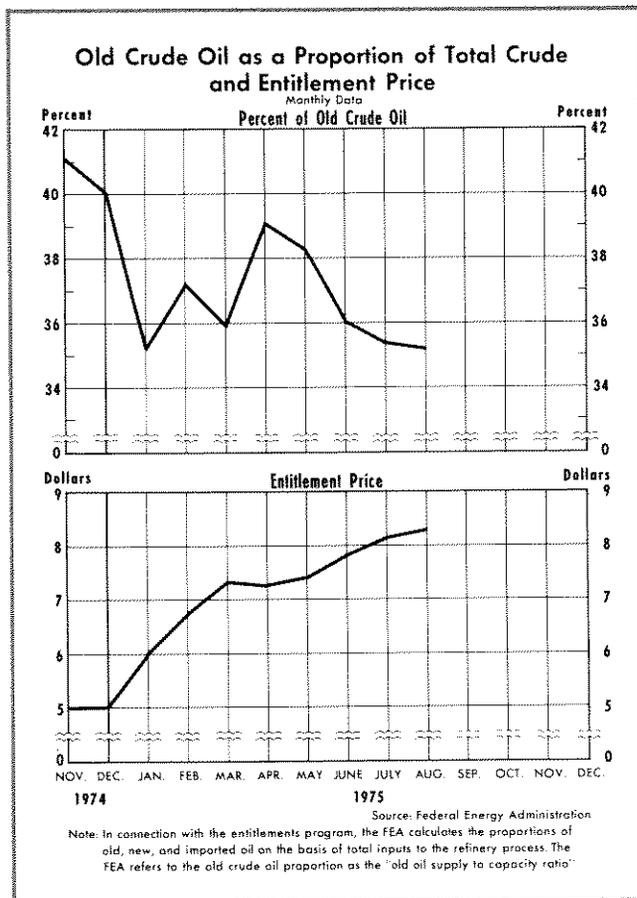
⁴For ease of illustration, it is assumed that entitlements are physical documents which are issued by the FEA. In reality, however, they are simply accounting fictions to which refiners are expected to adhere.

⁵The FEA establishes the price per entitlement but their choice is not arbitrary. The market price of an entitlement would rise to the difference between the controlled and uncontrolled price of a barrel of crude, even if the FEA remained out of the transaction.

Refiners with access to less than the national average of "old" crude can sell entitlements to those refiners with more "old" crude than the national average. The sale of entitlements represents a source of revenue to the refiner with less than the national average of "old" crude. The refiner who, for example, relies mainly on imported oil can use his entitlements revenue to reduce the effective cost of his crude oil input.⁶ With "old" oil representing about 41 percent of the national input mix and the price of an entitlement at \$7.31, the effective cost per barrel of imports to the refiner is reduced by \$3.00 ($.41 \times \7.31). That is, imports are subsidized to the tune of \$3.00 per barrel. For every barrel of oil imported, the importer is entitled to purchase 0.41 barrel at the controlled price of \$5.25 and is forced to pay the market price for only 0.59 barrel.

On the other hand, a refiner who uses more than the national average of "old" crude is required to purchase entitlements in order to enable him to process "old" oil in excess of the national average. A refiner who is able to meet his desired production schedule using only "old" crude is required to purchase entitlements for 59 percent of his input. In this case the effective cost per barrel to this refiner is increased by \$4.31 ($.59 \times \7.31). That is, "old" domestic oil is taxed to the tune of \$4.31 per barrel.

⁶The analysis with imported oil is also applicable to "new" domestic oil.



In essence, the price control and entitlements effort is an income redistribution program within the oil industry. Domestic "old" oil is taxed and the proceeds are used to subsidise the purchase of imported oil. This subsidy/tax program, through its effect on the relative prices of imported and domestically produced oil, has had a perverse impact on the national goal of self-reliance. Domestic production is discouraged by the imposition of price controls and therefore has continued to decline. This, in turn, has increased our reliance on external suppliers.

AN EVALUATION OF SOME DECONTROL ARGUMENTS

Will Decontrol Lead to Higher Petroleum Prices?

Regardless of whether petroleum prices are controlled or decontrolled, the price of crude oil to domestic refiners is going to increase. However, the price increases associated with either alternative have completely different implications for domestic production and imports.

The continued maintenance of the oil price controls program will not prevent domestic oil prices from rising. This would occur even without price increases for any of the three sources of supply ("old", "new", imports) to domestic refiners. As production of "old" domestic oil declines and imports increase as a result of the controls program, the *proportion* of the higher priced oil (domestic "new" and imports) increases, thereby raising the effective domestic price of petroleum.

The response to the lifting of domestic price controls will be an immediate rise in the price of petroleum. As long as the United States imports any oil at all, the price of crude to domestic refiners will be dictated by the foreign oil cartel. Accompanying the price rise, however, will be an increase in the quantity of oil produced domestically. Although the increase would probably not be of a magnitude to allow achievement of self-sufficiency in the short run, it does imply a cutback in imports.

Such a situation would create difficulties for foreign suppliers, particularly the Organization of Petroleum Exporting Countries (OPEC), who have already been forced to cut back production in order to maintain existing prices. With reduced U.S. purchases of imported oil as a result of decontrol, additional downward pressure on external oil prices would result. In order to maintain prices, OPEC would have to voluntarily accept a further cut in production and income — and at a time when their domestic development programs are in high gear.

Is the Market Solution Viable?

The free market, or decontrol, solution is rejected by various groups of society. Proponents of continued price controls on "old" oil suggest that although the market price of petroleum products has already doubled, the reduction in the quantity of petroleum products consumed has been insignificant. In fact, they argue that whatever reductions have been observed can be attributed to the reduction in business activity, not the increase in prices. In addition, they maintain that the current high prices have not elicited increased petroleum production. Curiously, these arguments lead to the conclusion that in order to achieve both less reliance on imports and greater domestic production, price increases substantially in excess of those already observed would be necessary.

Opponents of continued price controls, on the other hand, argue that economic agents are not indifferent to the prices they pay and do indeed respond to changes in relative prices. They point out, however,

that it is necessary to distinguish between a short-run and a long-run response of both quantity supplied and quantity demanded. With respect to the quantity demanded, the opponents of price controls point out that the short-run response to a hike in prices can indeed be very weak. This has to do with the fact that the nation's capital stock is energy intensive and costs of rapid adjustment to less energy intensive means of production are substantial. The energy requirement per unit of output that has been built into production processes has been based on "cheap" oil, and as a result of today's prices, much of the existing capital stock has become inefficient.

Reductions in the quantity of oil demanded depend on the substitution of relatively less energy intensive means of production. An example would be the replacement of an automobile that averages 15 miles to a gallon of gasoline with one that gets 30 miles per gallon. The fuel costs per passenger mile as a measure of the product produced by an automobile would then be reduced. While this substitution process is proceeding quite rapidly in the area of automobiles, the conversion cost to many industries is very high in the short run and therefore would be expected to take place only over time. Although this adjustment does take time, it must not be forgotten that the economic incentives to make it are great and there is no reason to believe that the adjustment will not eventually be made. The quantity demanded is indeed responsive to price if sufficient time is given for the affected economic agents to respond.

Opponents of continued price controls also point out that the response of the quantity of oil supplied to a change in price has not been substantial because a great deal of uncertainty surrounds the return on new investment projects. For example, exploration for new oil wells, more intensive utilization of existing oil wells, as well as research into new methods of production (such as the liquification of coal and offshore drilling) all require extensive capital investments. Even though today's high market prices for oil might justify such investment expenditures, uncertainty with respect to the future price of oil greatly lessens the incentive to undertake such investments.⁷ This argument implies that domestic producers expect world market prices to decline from their present highs and that "cheap" imports could once again be substituted for domestic production.

⁷There is the additional problem of uncertainty about future tax programs which could reduce sharply the rate of return on these investments, even if the current price of oil prevails.

Former Secretary of the Treasury George P. Schultz recognized this dilemma of uncertainty. He suggested that if self-reliance is indeed a national goal, uncertainty which faces domestic producers should be eliminated. To this end Schultz proposed a variable tariff on imports designed to maintain today's high external price. In the event that the foreign oil cartel would disintegrate and world market prices decline, the proceeds from the tariff could be distributed to consumers via the tax system.

In general, then, those opposed to decontrol are not convinced that market forces will produce greater self-sufficiency and lower petroleum product prices. Those in favor of the removal of petroleum price controls, however, contend that government restrictions only hinder domestic oil production and provide incentives to import, thereby supporting the collusive actions of OPEC. Both of these effects tend to enhance the unity of OPEC members, whose continued strength would result in higher petroleum prices for U. S. consumers. An additional objection is that reliance on controls to provide solutions to economic problems in many cases only aggravates and intensifies the initial problem.

CONCLUSION

The analysis presented in this article points out that the currently existing oil price controls program has been successful in achieving its intended purpose — cushioning domestic prices of petroleum products from the higher world oil prices. But the analysis also suggests that the controls program is in conflict with its stated purpose over the long run. In particular, controls provide both disincentives to produce oil domestically and incentives to import oil. As imported oil becomes an increasing proportion of total domestic consumption, the effective domestic price of oil will increase also. The greater U. S. reliance on foreign sources of supply, in turn, enhances the unity of the foreign oil cartel such that the United States becomes increasingly vulnerable to external pricing and producing decisions. A situation has been fostered which would perpetuate rising world oil prices in the future.

There is an alternative to this rather ominous scenario. Even though petroleum prices would increase as a result of decontrol, incentives for both increased domestic production and reduced imports are provided. Increased domestic production and reduced imports, in turn, would tend to strain the unity of the oil cartel, and hence, be conducive to lower world market prices for petroleum in the future.