Oil Price Decontrol and Beyond

Price controls on United States domestically produced crude oil are currently being eliminated,* marking an important step toward resolving our energy problem. Oil price decontrol is one key part of a broader national initiative, which includes decontrol of natural gas prices, encouragement of alternative energy sources, and incentives for greater conservation and efficiency. The main purpose of these efforts is to reduce our dependence on increasingly costly and uncertain supplies of foreign oil.

Decontrol of domestic oil will have several important effects. First, by October 1981, when decontrol is scheduled to be completed, United States refined petroleum prices will be at least 20 to 30 cents per gallon higher than they would be without decontrol. Second, a price rise of this magnitude should lower United States petroleum usage about 1 million barrels per day. Third, since higher prices appear to have stimulated United States crude oil production, the total impact of decontrol on United States imports is probably greater than 1 million barrels daily. Fourth, by raising the responsiveness of our oil imports to foreign prices, dropping the controls mechanism raises United States resistance to future foreign price increases If the completion date for decontrol is moved to earlier in 1981, its full effects would come sooner and more abruptly but in other respects would be basically the same as those outlined here.

There is, however, good reason to believe that the mere decontrol of domestic crude oil prices does not go far enough. Because of the potentially devastating effects of petroleum supply disruptions on the United States economy, the cost of imported oil clearly exceeds its dollar price. Further steps beyond decontrol, therefore, are called for to discourage imports Tax policies which effectively raise the relative price of petroleum in the United States would be a logical extension of the decontrol strategy.

The price-control mechanism

Before examining the implications of decontrol, it is helpful to review the basic elements of the price-control system which is being phased out. United States crude oil price ceilings originated in the general wage-price restraints of the early 1970s, but the basic form of the current controls evolved from the Energy Policy and Conservation Act of 1975.[1] Domestically produced crude oil was divided into two main categories, essentially based on the age and productivity of wells. Oil from older wells, labeled "lower tier" oil, was given a price ceiling below the ceiling for "upper tier" oil, which was produced from newer wells (or stepped-up output from older wells). In 1976, production from small "stripper" wells—wells producing under ten barrels daily—was decontrolled.[2]

The ceilings kept the average price of domestic oil below the cost of imported oil. Without controls, re-

* This article was written prior to President Reagan's recent announcement immediately ending all price controls on crude oil and petroleum products As noted in the text, this does not substantially change our conclusions

1 For a description of how Federal petroleum regulations evolved since the 1930s, see Paul A MacAvoy, ed , *Federal Energy Administration Regulation,* American Enterprise Institute for Policy Research (Washington, D C , 1977)

2 Oil from the Naval Petroleum Reserve, which has never accounted for more than 1 6 percent of total domestic production, was also exempt from price regulations

finers would be willing to pay a similar price, including transportation costs, for crude oil from both foreign and domestic suppliers. For example, in the fourth quarter of 1978 the average price of foreign oil delivered to United States refiners was $14 77 per barrel. Stripper oil, which accounted for 15 percent of domestic United States production, received an uncontrolled price of $14.54 per barrel, close to the import price. Due to wellhead ceilings, however, the 35 percent of United States output classified as lower tier received only $6.14 per barrel. Upper tier oil (excluding Alaskan) was priced at $13.00 per barrel and accounted for 35 percent of domestic oil Alaskan North Slope oil, which at the time made up 14 percent of United States output, also was technically subject to the upper tier wellhead ceiling but, due to high transportation costs, actually received a wellhead price less than the ceiling in order to stay competitive with uncontrolled oil from other sources.[3] For all domestic oil, the combined average cost to refiners, including transportation, was $10.88 per barrel, well below the average import price.

The price ceilings were pegged to the implicit gross national product (GNP) price deflator Although this has permitted the ceilings to keep pace with the inflation rate, foreign oil prices since the end of 1978 have risen much more than the general price level, causing the gap between the domestic ceilings and the price of imports to widen.

Merely holding down domestic crude oil prices, however, would not guarantee that prices paid by consumers of refined products would be lower. The domestic price level for refined petroleum must be high enough to make it profitable to refine and market not only price-controlled oil but also oil from every other source needed to satisfy total domestic demand, including expensive foreign supplies. Thus, if left alone, refined products prices would reflect the high cost of foreign oil. Refiners of imported oil would cover their costs, and refiners with access to price-controlled oil would be in a very profitable situation. To make sure that United States refined petroleum prices were indeed lower, and to remedy the potential inequities among refiners, an import subsidy was enacted as part of a system of crude oil "entitlements" to complement the crude oil price controls.[4]

Under the entitlements program, refiners of price-controlled crude oil pay a uniform per-barrel subsidy to refiners of imported and uncontrolled domestic crude oil. The subsidy lowers the effective cost of refining foreign or uncontrolled domestic oil, thereby lowering the price level of refined products. At the same time, the required payment raises the average effective cost of refining price-controlled oil, making it approximately equal, on balance, to the average effective cost of foreign and uncontrolled domestic oil.[5] The average effective cost of all oil to United States refiners, therefore, is below the price of imported crude.

Since the entitlements payments roughly equalize the average effective cost of imported and price-controlled crude oil, the size of the subsidy automatically rises when the import price increases relative to domestic price ceilings.[6] For example, between December 1978 and May 1980, the average delivered price of imported crude oil to refiners rose from $14.94 per barrel to $34.33 per barrel. Over this period, the lower tier wellhead price ceiling increased only from $5.68 to $6.47, reflecting general price inflation. As a result, the import subsidy, which was $1.27 in December 1978, jumped to $6.22 per barrel by May 1980.

Prices of United States refined products can rise faster than average effective crude oil costs during a tight world market. Since the import subsidy is paid on a uniform per-barrel basis, it does not always fully offset the higher crude oil costs paid by those refiners who are forced to seek supplies from particularly expensive foreign sources. Even if most officially posted foreign contract prices remain unchanged during a world shortage, refiners without sufficient contractual supplies may find it unprofitable to turn to more expensive sources unless United States refined product prices rise. Under these circumstances, if the extra supplies are needed to meet domestic demand, refined product prices in the United States can rise considerably, even though the average effective cost of all foreign oil increases much less. The spread between refined products prices and average effective crude oil costs therefore rises. Conversely, during a glut on the world market, refiners can buy oil for less than the

[3] At the wellhead, Alaskan North Slope oil received an average price of $5 22 per barrel in 1978, compared with $12 15 per barrel for other upper tier oil At the refinery gate, Alaskan oil generally received at least as much as other upper tier, and often more

[4] In addition, until mid-1976, prices of most refined products were controlled directly Currently, gasoline is the only major refined product category subject to direct price controls, but these controls apparently are not effectively binding much of the time

[5] The required payment per barrel of upper tier crude oil is less than the payment per barrel of lower tier oil by just enough to equalize the effective costs of these two categories of crude oil For a more detailed description of the system, see Kay Sherwood, "Crude Oil Entitlements Program", *Monthly Energy Review* (January 1977)

[6] More exactly, the entitlements system approximately equalizes the average effective cost of price-controlled oil and the average combined effective cost of imported and uncontrolled domestic crude oil Most of the time, however, market forces cause the price of uncontrolled domestic oil to be about the same as the import price

long-term contract prices and, receiving the same per-barrel subsidy as other importers, can force down United States refined products prices relative to the average effective cost of all imported oil. Over the long run, United States refined products prices would be held below the level consistent with average imported oil prices by an amount corresponding to the import subsidy, but in the short run the spread between United States refined products prices and average effective crude oil costs can fluctuate in response to shortages or gluts on the world market.

For example, suppose the price charged for most imported oil was $30 per barrel but, for domestic demand to be satisfied, some oil would have to be imported at $40 per barrel. Unless domestic refined products prices were high enough to make importing the more expensive oil profitable, refiners would not buy it, and the resulting shortage would drive up the price of refined petroleum in the United States until it reflected the $40 per barrel cost less the uniform subsidy. Since the bulk of crude oil was still being bought at controlled domestic prices or at the $30 per barrel import price, the spread between refined products prices and average effective crude oil costs would widen as well. If, however, supplies of $30 oil subsequently became more abundant, the price of refined products would drop to reflect an effective crude oil cost of only $30 per barrel less the entitlements subsidy, and the spread between refined products prices and average effective crude oil costs would narrow again.

The decontrol process

The current process of phasing out all crude oil price ceilings began in June 1979 and is scheduled for completion in October 1981. In the month before decontrol started, 83 percent of all domestic production was subject to price ceilings—34 percent lower tier and 49 percent upper tier (including Alaskan) During the phaseout period, lower tier is being gradually reclassified as upper tier while, simultaneously, upper tier is being gradually freed of price controls entirely. In addition, oil with a high sulfur content, newly discovered oil, and oil that is difficult and costly to recover are now free of price ceilings.[7] By the middle of 1980, the proportion of domestic output subject to price ceilings was down to 47 percent (15 percent lower tier and 32 percent upper tier). During the first year of decontrol, therefore, the proportion of total domestic output free of price controls rose from 17 percent to 53 percent.[8]

As crude oil price ceilings are eliminated, the released domestic oil receives a price comparable to foreign oil prices. Consequently, the value of the entitlements payments, which equalize average effective foreign and domestic crude oil costs, will fall automatically to zero as decontrol approaches completion. As the entitlements subsidy on imports disappears, the effective cost of crude oil going into United States refined products prices will rise to the price of imported oil.[9]

How much lower would effective crude oil costs and refined petroleum prices have been without decontrol? This depends on how large the import subsidy would have been had controls been continued. Suppose, for example, that the delivered price of imported oil, which was $34.48 per barrel in June 1980, reaches just $35 per barrel by October 1981. In this case, under plausible assumptions regarding the path of the continued controls mechanism, by October 1981 the import subsidy would have reached $8 per barrel, or 19 cents per gallon.[10] More plausibly perhaps, an October 1981 import price of $39 per barrel would result in an import subsidy of $10 per barrel (24 cents per gallon), while a $44 price would imply a $12 per barrel (29 cents per gallon) subsidy. Depending on foreign prices, therefore, by October 1981 the effective cost of crude oil going into United States refined products would be around 20 to 30 cents per gallon higher than without decontrol Approximately the same figure

[7] For definitions of these new categories of uncontrolled oil, see United States Department of Energy, *Monthly Energy Review* (September 1980), pages 76, 96-97

[8] Due to high transportation costs, however, the upper tier ceiling on Alaskan North Slope output (15 percent of the domestic total in May 1979) became an effective constraint on wellhead prices only after decontrol had already begun This reflected the sharp rise in the world market price

[9] The size of the entitlements subsidy can be expressed as the product of (a) an appropriately weighted sum of lower and upper tier oil as a fraction of all oil refined and (b) the difference between the average price of all imported and uncontrolled domestic oil eligible for the subsidy and the lower tier price ceiling As price ceiling coverage is phased out, term (a) becomes zero, eliminating the subsidy As noted earlier in this article, however, the rise in world prices during the first part of the decontrol process caused an increase in term (b) sufficient to produce a temporary rise in the subsidy Without the phaseout of coverage, of course, this rise would have been larger (and not temporary)

[10] Without decontrol, the October 1981 category shares were projected as lower tier, 24 percent, upper tier (excluding Alaskan), 43 5 percent, Alaskan, 16 percent, and uncontrolled, 16 5 percent Price ceilings and transportation costs were projected to rise at a 10 percent annual rate, and imports were projected to account for 45 percent of the crude oil used in the United States

applies to refined petroleum prices.[11] Over the 29-month phaseout period (June 1979 through October 1981), therefore, decontrol will have added roughly a penny per month to United States petroleum prices

The actual path of refined products prices since the start of decontrol has differed somewhat from the path of average effective crude oil costs, but this has been mainly due to the successive tightening and loosening of the world market during this period. The Iranian production cutoff at the beginning of 1979 sent spot market prices soaring. Some exporting nations raised prices considerably higher than others, and the price of uncontrolled domestic oil in the United States was bid above the average import price.[12] Thus, as crude oil prices from certain key sources rose considerably more than the overall average, the price of United States refined petroleum rose more than the average effective cost of crude oil from all sources together. The spread between refined products prices and average effective crude oil costs had already widened by June 1979 when decontrol began, but it continued to increase as the world market remained tight through early 1980 (Chart 1). By summer 1980, spot prices had fallen off and domestic uncontrolled oil had come back into line with average import prices, reflecting a loosening of the world market.[13] As a result, the spread between United States refined products prices and average effective crude oil costs narrowed again During all this period, however, decontrol was making the import subsidy smaller than it otherwise would have been. This in turn raised the effective cost of crude oil from every source, thereby increasing United States refined petroleum prices above what they would have been without decontrol.

[11] In the very short run, any reduced usage of petroleum in response to higher prices may lower the profitability of refinery and distribution operations, reflecting competition for a smaller total amount of business In the longer run, however, refining and marketing capacity will not be replaced unless the return on such investments justifies the capital costs Ultimately, therefore, the final products prices will reflect the whole higher cost of crude oil plus the necessary capital and operating expenses of refining and distributing it

[12] Late in 1978, Libyan and Algerian oils were priced about 10 percent above Saudi Arabian light crude oil, but by the middle of 1979 the price differential had widened to around 30 percent See Department of Energy, *Weekly Petroleum Status Report* (August 1, 1980), page 39

In December 1978 the average price, including transportation, of United States stripper oil was $14 57 per barrel, close to the average comparable import price of $14 92 By December 1979, however, stripper oil was selling for $33 43 per barrel, while the average price of imported oil was $28 91 per barrel

[13] By July 1980 the average price, including transportation, of stripper oil was $34 45 per barrel, just under the average import price of $34 51

The effect on imports

Even casual observation confirms that higher prices reduce United States petroleum use. After the first major oil price hike in 1973-74, the rate of growth of United States petroleum consumption slowed dramatically to 1.7 percent annually during 1973-78, compared with 4.7 percent over 1949-73. During 1978-80, total consumption declined at a 5 percent annual rate.[14] Moreover, the ratio of petroleum use to GNP was 17.2 percent lower in the first three quarters of 1980 than its 1973 level.[15]

These observations are supported by a statistical analysis of the relationship over time between United States petroleum prices and consumption The results show that, holding GNP constant, a 10 percent rise in the wholesale price of United States petroleum products is on average associated with roughly a 2 percent fall in total usage.[16] For example, in the scenario described above with the price of imports reaching $39 per barrel by October 1981, the impact of decontrol on United States products prices (assuming a penny-for-penny pass-through of crude oil costs) is calculated as 24 cents per gallon, which amounts to a 28 percent rise at the wholesale level. This, in turn, should result in a fall of between 5 0 and 8 5 percent

[14] Total United States consumption is measured as deliveries of petroleum products from primary storage The figure for 1978-80 is based on a comparison of the first nine months of 1978 and 1980 Sources Department of Energy, Energy Information Administration, *Annual Report to Congress 1979*, Volume Two, page 43, and *Monthly Energy Review* (June 1980 and December 1980)

[15] The ratio of petroleum deliveries (thousands of barrels daily) to real GNP (billions of 1972 dollars) was 13 79 in 1973 and 11 42 over the first three quarters of 1980

[16] Over the period 1975-I to 1980-II, an ordinary least squares regression was performed, with the following result

$$C = 1\,83 - 0\,14P + 0\,57Y + 0\,41C(-1)$$
$$(2\,1) \quad (3\,2) \quad (2\,7) \quad (2\,0)$$
$$\bar{R}^2 = 0\,86, \text{ D W } = 1\,63, \text{ SEE} = 0\,02$$

C is total petroleum consumption, P is a wholesale price index of refined petroleum products, deflated by the GNP implicit price deflator, and Y is real GNP, all in logarithmic form The t statistics are in parentheses The coefficients of the price and income variables are the respective short-run elasticities The long-run price and income elasticities are −0 23 and 0 96, respectively, with 87 percent of the effect of movements in price and GNP on consumption occurring within two quarters and 95 percent within three quarters

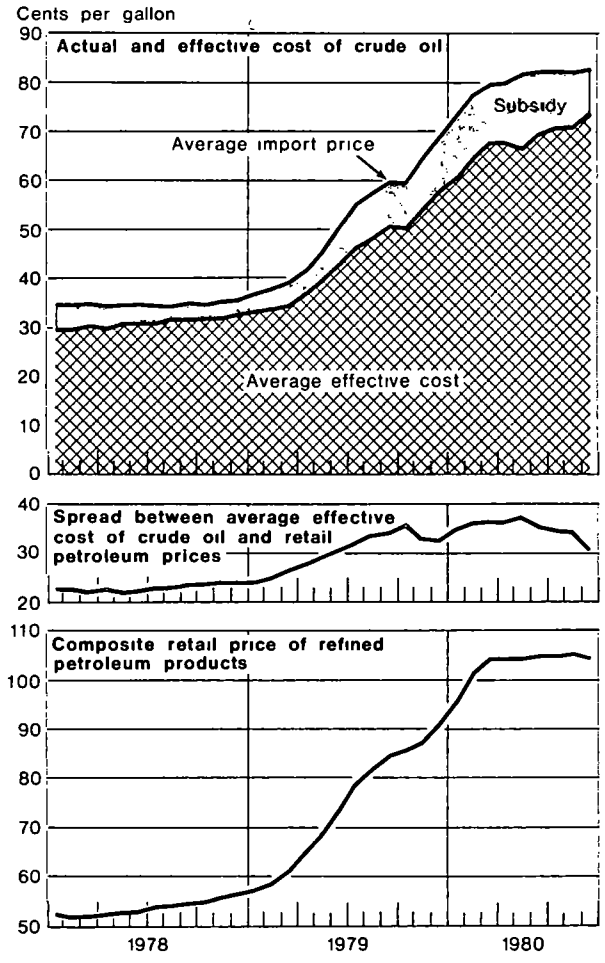
The lag structure is admittedly crude Experimentation with alternatives failed to find a lag structure that was robust with respect to its specification However, the total effect of price on consumption proved virtually unchanged under the alternative specifications

An autocorrelation correction was performed to check for the possible bias in the D W statistic imposed by the presence of the lagged dependent variable, but this caused essentially no change in the coefficients

A statistical appendix, containing sectorally disaggregated estimation results, as well as alternative estimation procedures, is available from the authors The various methods yield similar results

Chart 1

United States Crude Oil Costs and Refined Petroleum Prices



Source United States Department of Energy

in total United States consumption, or between 800,000 and 1 35 million barrels per day [17]

The impact of decontrol on consumption, therefore, is to reduce imports of foreign oil by about 1 million barrels daily, equal to 18 percent of the level of imports in August 1980 This, moreover, understates the total effect on imports because United States petroleum output also depends on price With newly discovered oil now allowed to receive an uncontrolled price, drilling activity has stepped up considerably [18]

Effect on the consumer price index

The 24 cents per gallon increase in retail prices over the 29-month period of decontrol adds about 6 percentage points to the annualized rate of increase in the consumer fuel and power component of the consumer price index, using August 1980 as a base level Since this component accounts for about one tenth of the total index, the impact of decontrol on the whole index is to add 0 6 percentage points to its annualized rate of increase between June 1979 and October 1981 Because this does not take into account the pass-through of higher energy costs into the prices of other consumer goods and services, the actual total impact may be somewhat greater

Resistance to future foreign price hikes

Under controls, the import subsidy automatically rose along with foreign prices, offsetting roughly half of the impact of higher import prices on the effective cost of crude oil to refiners [19] Without the subsidy, any future foreign price hike will result in a larger increase in United States refined petroleum prices and, therefore, in a greater reduction of oil imports This makes it more difficult for exporters to raise prices unilaterally, since a given price rise would then require a bigger production cutback

Suppose, for example, that the Organization of Petroleum Exporting Countries (OPEC) is considering two alternative strategies, one that increases prices by 10 percent and the other that raises prices 12 percent For the sake of argument, also assume that the sensitivity of petroleum demand to price changes in the noncommunist world is about the same as it is in the United States With total noncommunist world consumption at about 50 million barrels daily, of which 16 million is United States consumption, a 10 percent

[17] In August 1980, the approximate midpoint of the decontrol period, the composite wholesale refined products price was 86 cents per gallon and petroleum consumption averaged 15 8 million barrels per day A 24 cents per gallon price increase implies a rise of 28 percent and, using the above elasticity estimate, results in a point estimate of about 1 million barrels per day The range in the text allows for one standard deviation around the mean elasticity estimate

[18] In the first eight months of 1980, 37 percent more oil wells were drilled in the United States than in the first eight months of 1979 See Department of Energy, *Monthly Energy Review* (October 1980), page 50

[19] Under controls, with imported and uncontrolled domestic oil accounting for roughly half of refiners' crude oil inputs, a $2 rise in the imported (and uncontrolled) price would raise the overall average cost by $1 The import subsidy would rise about $1, and the average effective cost of imported oil would, therefore, be up only $1 on balance

price increase would induce a 2 percent fall in consumption outside the United States, or 680,000 barrels daily. Due to price controls, however, United States consumption would fall only 1 percent, or 160,000 barrels daily Thus, with United States price controls, OPEC would have to cut production by a total of 840,000 barrels daily in order to sustain the 10 percent price increase. Similarly, a 12 percent price rise would require an OPEC production cutback of 1 million barrels daily with United States price controls

Without United States price controls, however, OPEC's price-raising options would not be so great Without the import subsidy to mitigate the impact of price increases on United States petroleum users, cutting current production by 1 million barrels per day would sustain only the 10 percent price increase rather than the 12 percent rise possible before. More generally, with world petroleum demand rising because of economic growth, OPEC might even be able to sustain price hikes without cutting current output, but the price rise possible under each alternative production scenario will be smaller without United States controls

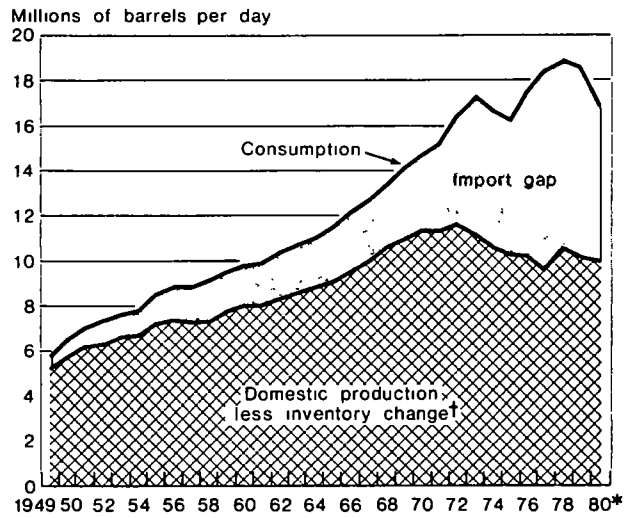
Beyond decontrol

Crude oil price controls encouraged too high a level of petroleum consumption, discouraged domestic energy production, and increased oil imports Although the full price of each barrel of imported oil is paid to the exporter, the subsidy makes the refined petroleum appear cheaper to the user. The user may be aware of economical ways to reduce consumption through alternatives costing less than the foreign oil. The controls program, however, reduces the incentives to pursue these alternatives, and potential savings go unexploited If the true cost of foreign oil were no greater than its price, merely removing controls would rectify the problem, for then petroleum users would be motivated to pursue all the alternatives costing less than the unsubsidized price of oil

It is clear, however, that the true cost of foreign oil exceeds its dollar price Most obviously, our dependence on imported petroleum leaves the country vulnerable to the threat of economic disruption.[20] In the 1970s, despite higher petroleum prices, United States dependence on imports rose dramatically as domestic oil production fell and consumption was

Chart 2

United States Petroleum Production and Consumption



*Preliminary for 1980

†Domestic production includes crude oil, natural gas plant liquids, processing gain, unaccounted-for crude oil, and other hydrocarbons

Source United States Department of Energy

boosted by the growth of the economy (Chart 2). Domestic oil price decontrol will augment the already ongoing response to higher imported oil prices in making United States industry, homes, and automobiles more fuel efficient. Nevertheless, the United States has become so dependent on foreign oil that it will require a strong, sustained initiative to resolve the long-run problem meaningfully. Effective new policies will be needed to make possible both sustained economic growth and substantial progress in reducing oil imports

A logical and desirable extension of crude oil price decontrol would be a tax to discourage imports. This could take the form of an added tax on gasoline consumption, an oil import fee, or many other possibilities The basic idea is to raise the effective cost (including the tax) of petroleum to a level that more correctly reflects the true cost of importing foreign oil. This would further lower our imports; the higher the tax, the less foreign oil we would use. Such a tax could then offset other government revenue sources and thus would not require a net rise in overall taxes.

In Europe, gasoline is subject to much higher taxes

[20] In addition, the more we reduce United States oil consumption (which accounts for nearly 30 percent of world oil output) the more slack this allows in the world market, making it increasingly difficult for exporters to maintain or raise their prices Even if reducing United States oil consumption initially costs more than the dollar price of the oil, the subsequent effect on import prices would make it worthwhile since the cost of the remaining oil imports would then be lower than otherwise

than in the United States. As of July 1980, the tax on a gallon of gasoline was $2.16 in Italy, $1.68 in France, $1.23 in West Germany, and $1.19 in Great Britain. In the United States the average tax in May 1980 was only 14 cents per gallon. Suppose, for example, that an additional one dollar per gallon tax on gasoline in the United States were imposed at the expiration of controls in October 1981. A rough estimate is that this would induce a fall of 12 to 14 percent in United States gasoline consumption.[21] This would amount to a reduction of demand between 785,000 and 910,000 barrels per day, which is 11 to 13 percent of current United States petroleum imports.

An alternative would be to limit petroleum imports directly with an import quota.[22] With the petroleum available to the domestic market restricted, the license to import petroleum would take on value. The costs associated with securing the import license then would be added to the imported oil price, raising the total effective cost of petroleum on the domestic market, just as a tax would. In this respect, direct limits on imports would be similar to a tax on petroleum.

In another important respect, however, direct quotas would be much worse since they would seriously undermine our resistance to future foreign price increases. If exporters raised their price, a petroleum tax would maintain the desired gap between the import price and the effective cost of petroleum on the domestic market, and imports would fall. Under a quota system, however, imports are essentially predetermined. A foreign price increase would simply reduce the value of the import licenses. Unless the quota could be automatically adjusted downward whenever oil prices were raised, the foreign price hike would be, in a sense, completely subsidized, leaving domestic petroleum prices unaffected.[23] With United States consumers' responses eliminated, the sustainable price rise associated with each alternative production scenario of exporting nations would be greater.

Conclusion

Decontrol is clearly a step in the right direction, but once that is completed new initiatives to reduce oil imports will be required. Replacing the current subsidy on oil imports with higher taxes on petroleum would help move the United States toward this goal. Unlike quotas, higher petroleum taxes would retain the United States increased resistance to future foreign price hikes. Furthermore, revenues from the petroleum tax would stay in the country and could replace other sources of funding for government. Only by continuing decontrol's serious initiative against imported oil can the United States realistically pursue both economic growth and less dependence on foreign oil.

[21] Price and income elasticities for gasoline demand were estimated as −0 27 and 0 68, respectively (see the statistical appendix, available from the authors), implying a level of gasoline consumption in 1981-III of 6 4 million barrels per day The range reported in the text allows one standard deviation from the mean in the price elasticity

[22] This analysis of import quotas also generally applies to schemes for directly rationing petroleum among final users, with the cost of rationing coupons analogous to the cost of import licenses

[23] If foreign oil prices rose so much that the quotas became irrelevant, then from that point on price increases would no longer be subsidized

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