
Black Gold

The End of Bretton Woods and the Oil-Price Shocks of the 1970s

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The U.S. dollar price for a barrel of oil rose from \$3.35 in January 1970 to \$32.50 by the end of the 1970s. On a single day, January 1, 1974, the Organization of Petroleum Exporting Countries (OPEC) raised the U.S. dollar price of oil a staggering 135 percent, from \$4.31 to \$10.11.¹ Few would disagree that OPEC's action was one of the most important events of the 1970s—so important, in fact, that even current U.S. high school students are generally aware of it. Virtually all economists, ourselves included, agree that it had a major impact on the world economy. A huge price rise in such an important commodity certainly had a tremendous allocative effect, and many economists also interpret it as having a causal effect on U.S. price inflation.² Whether it caused U.S. price inflation, either directly via cost-push or indirectly via monetary accommodation, is still being debated, but the rise in the price of oil remains central to the arguments.³ We do not enter that debate here.

The standard explanation of OPEC's ability to implement such a dramatic price increase is that its members composed an effective cartel, and, motivated by a cluster of political events and nationalizations of oil facilities, they used their cartel power to

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1. All data from www.marketvector.com. Gold, London fix, dollars per ounce, average of daily prices. Oil, Spot Oil Price, West Texas Intermediate; prior to 1982, posted price, dollars per barrel. Data from Dow Jones Energy Service.

2. For the typical approach to the inflationary impact of oil-price shocks, see Blanchard 2003, 152–56.

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extract more monopoly rents from the West. However, this interpretation is not the only way to model OPEC's behavior.⁴ In this article, we make no attempt to provide yet another model to explain OPEC's behavior.

Independently of how OPEC's behavior is modeled, implicit in all the analyses we have seen is the assumption that the appropriate index to compute the real price of oil is a U.S. price index, such as the Consumer Price Index (CPI). Our purpose here is to challenge and to modify that assumption.

The microeconomic cartel model, for example, implicitly assumes that both the buyer and the seller are using the same currency with a constant price level. Therefore, both sides agree on the *real* price. Given the change in institutional environment that took place in the early 1970s—namely, the end of the Bretton Woods Agreement—the naive application of the cartel model, among others, is inappropriate to analyze the OPEC price increase and, without some adjustment, may be fundamentally misleading. We are not offering here a historical-revisionist argument that the price rise never really happened—we recognize that OPEC really did increase the U.S. dollar price of oil by more than 800 percent in the 1970s. Nor do we attempt to explain how OPEC arrived at its pricing decisions. We have a modest goal: to examine, in a world of flexible exchange rates and institutional change, whether that more than 800 percent increase in the U.S. dollar price of oil entailed that the real price of oil *received by* OPEC members increased by more than 800 percent.

The 1970s

During the 1970s, the U.S. price level, measured by the CPI, rose by 106 percent. The U.S. dollar price of oil rose by 870 percent. Therefore, the real price of oil from the perspective of American purchasers actually rose by approximately 370 percent. This increase was a dramatic change given that the real price of oil had fallen by 20 percent during the previous twenty years.

The foregoing view, however, is entirely from the perspective of U.S. demanders of oil. When analysts apply the cartel analysis to OPEC behavior, they are making the simplifying assumption that both the buyer and the seller are using the same currency and agree on the price level. This simplifying assumption would be relatively harmless in a world of fixed exchange rates, especially if rates were tied to a commodity, such as gold. Under such a system, changes in the price measured by one currency are easily mapped onto changes in prices measured by other currencies or to the price of the

3. For example, Barsky and Kilian (2002) argue that the increases in oil prices in the 1970s could not have happened without increases in demand for oil in the developed countries, increases stimulated by their loose monetary policies. Both Blanchard (2002) and Blinder (2002) question the Barsky-Kilian interpretation. Although we agree with Barsky and Kilian's focus on macroeconomic, as opposed to political, causes leading to oil-price changes, we believe that the timing and size of the oil-price changes suggest that OPEC countries were keying on purchasing power when deciding how much and when to raise oil prices.

4. See the papers in Griffin and Teece 1982 for economically sophisticated views of how OPEC's pricing behavior through the 1970s and into the 1980s may be modeled.

base commodity. Therefore, it is reasonable to assume that both parties are using the same currency and agree on changes in the price level.

This simplifying assumption is not harmless, however, when we are analyzing the OPEC price increase of January 1, 1974, because, commencing on August 15, 1971, the Bretton Woods system of fixed exchange rates collapsed, giving way to flexible exchange rates and a rapidly evolving institutional setting.

To appreciate the impact of this institutional change, consider how the world looked during this time from the perspective of sellers of oil who made the bulk of their sales to Western countries and Japan. With the proceeds of their sales, sellers purchased goods and services from the advanced industrial countries (and others) and made investments. In 1970, oil contracts were stipulated in U.S. dollars, and all currencies were fixed in relation to the U.S. dollar and in relation to gold (because the dollar itself was fixed at \$35 per ounce of gold). With low inflation and fixed (or relatively stable) relationships between the currencies, the real price of goods could be computed easily regardless of where they were purchased. Therefore, the currency or commodity in which the price of oil was quoted made relatively little difference. Prior to World War II, oil contracts had been quoted in terms of gold or pounds sterling. If that practice had continued into the early 1970s, little would have changed for either purchasers or sellers of oil.

The collapse of Bretton Woods and the end of the fixed price of gold in 1971 changed the situation substantially. As OPEC quickly learned, the currency or commodity in which the price of oil was quoted did matter now. If contracts had been stipulated in pounds sterling, then in October 1973 OPEC would have received from U.S. customers \$4.32 per barrel (versus \$4.31, the quoted price at that time). The prices are virtually identical because the U.S./U.K. exchange rate had not changed. However, if contracts had been stipulated in Yen, OPEC would have received from U.S. customers \$5.82 per barrel (versus \$4.31). And if contracts had been stipulated in gold, by October 1973 OPEC would have received \$11.83 per barrel from U.S. buyers. Note that this latter price is \$1.62 more than the price OPEC charged after the price “increase” that they instituted three months later.

Prior to 1974 the real price of oil to OPEC countries had been falling in terms of nearly all Western currencies and especially in terms of gold (and virtually every other commodity on the world market)—and this decline takes no account of the impact of rising inflation rates in most Western countries, including the United States.

The End of Bretton Woods

The Bretton Woods Agreement takes its name from the international conference held in the New Hampshire town of that name in July 1944. The conferees created international monetary agencies (the International Monetary Fund [IMF] and the World Bank) and rules governing exchange rates and international monetary cooperation, and those arrangements governed the conduct of world trade and payments until

August 1971. The arrangement provided for fixed exchange rates, with each member country fixing its currency value to the U.S. dollar.⁵ The price of gold, fixed at U.S.\$35 per ounce, applied to official transactions between national central banks.

In the late 1960s, several countries argued that U.S. fiscal and monetary profligacy, resulting from the financing of the Great Society programs and the Vietnam War and from the Federal Reserve's monetization of the government's deficits, contributed to their accumulating dollar reserves and their rising rates of domestic price inflation. These dollar reserves accumulated and inflationary pressures grew as those countries supplied more of their own currencies to the foreign-exchange markets in order to keep their currencies pegged to the dollar at the fixed rates. Therefore, they accused the United States of "exporting" inflation.

Once countries began to redeem these reserve dollars for gold, it became clear the United States could no longer support a gold price of \$35 per ounce. By early 1971, U.S. dollar liabilities exceeded \$70 billion, backed by only \$12 billion of gold (Yarbrough and Yarbrough 1994, 641). To staunch the outflow of gold, the United States suspended its obligation to buy dollars from foreign central banks at \$35 per ounce of gold. On August 15, 1971, the United States unilaterally and without consulting allies or the IMF closed the "gold window."⁶ With this "floating" of gold, the world moved from a fixed to a flexible exchange-rate system as countries followed West Germany's lead and stopped interventions in the foreign-exchange markets once the United States stopped buying dollars with gold (James 1996, 220).

Gold was initially revalued to \$38 per ounce, then to \$42, and shortly thereafter it was allowed to float freely. By mid-1973, the dollar price of gold had risen to \$90.50 per ounce, and by the end of the decade it had risen to more than \$455—an increase of 1,200 percent in less than a decade.

As the world adjusted to a new international trading arrangement, currency markets experienced turmoil. From early 1971 to mid-1973, the U.S. dollar fell dramatically relative to all Western currencies except the pound sterling. It fell more than 30 percent against the Deutschmark and the Swiss franc, and more than 20 percent against the currencies of Japan, France, Belgium, Holland, and Sweden. On average, by mid-1973 the U.S. dollar had fallen by 25 percent relative to the major Western currencies. Given that oil contracts were stipulated in U.S. dollars, this decline meant that oil revenues per unit from these countries fell to OPEC.

In addition, the average annual inflation rate in Western countries rose to more than 5 percent during the early 1970s and averaged approximately 9 percent for the entire decade across the Western countries (*Economic Report of the President 1992*,

5. All members' currencies were to be pegged to the U.S. dollar but were allowed to vary within a band of $+/-1.0$ percent. This band was later relaxed to $+/-1.5$ percent and then further to $+/-2.5$ percent.

6. For insight into the planning behind the U.S. decision to end the Bretton Woods Agreement, see James 1996, 215–20.

418, table B-105). Prices of nearly all commodities, not just gold, rose dramatically during the decade: aluminum by 165 percent, pig iron by 200 percent, lead by 170 percent, potash by 269 percent, silver by 1,065 percent, and tin by 219 percent (Kelly et al. 2004).

To focus only on the U.S. dollar price of oil is to ignore the chaos, falling revenues per unit, and rising prices that the sellers of oil were facing. Therefore, some proxy must be found to approximate the real price of oil to the sellers during this time. Such a proxy is no more arbitrary than using the U.S. dollar, which most analysts heretofore have used uncritically. For its historical role as an international store of value as well as its importance in the Middle East, we have chosen to use the price of gold in computing the real price of oil. Specifically, we focus on how many barrels of oil could be exchanged for an ounce of gold.

Even though oil contracts were stipulated in terms of the U.S. dollar for twenty-five years, gold remained important in the Middle East and continues to be important to this day. Dubai, in the United Arab Emirates, is one of the largest gold-trading centers in the world. Gold is a key transfer currency in the *hawala* money transfer system used by Middle Eastern and Asian traders, terrorist organizations, and the general public in that region.⁷

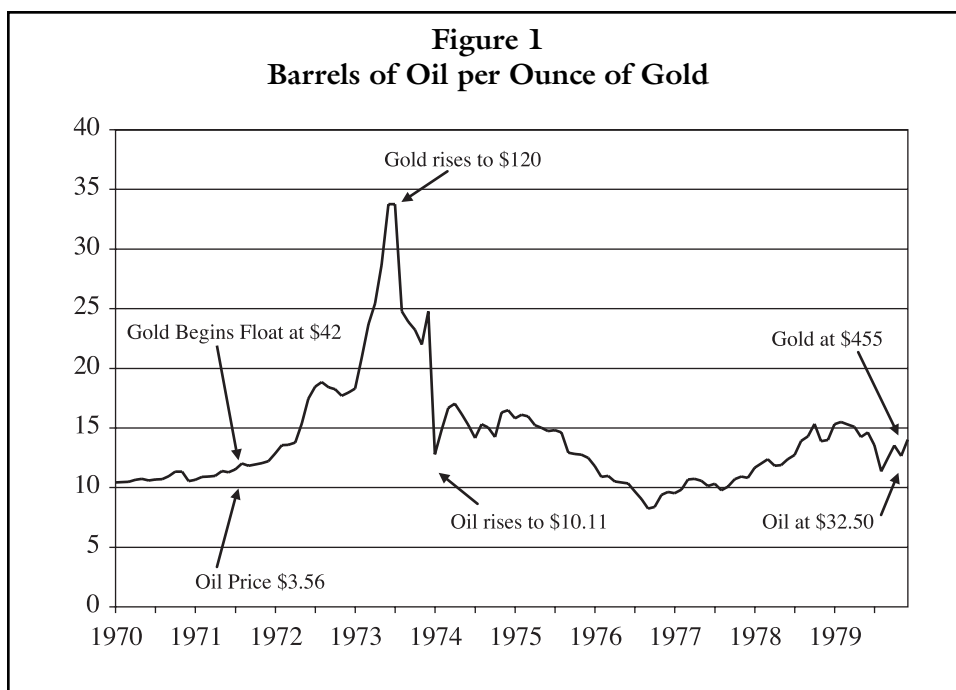
The Oil Price of Gold

When the price of oil is analyzed in terms of gold, instead of in terms of U.S. dollars, the 1970s look quite different. The U.S. dollar price of oil hardly changed from the end of World War II to the late 1960s: from 1947 to 1967, it rose by less than 2 percent annually on average (from \$2.07 to \$3.07 per barrel), not even keeping up with U.S. price inflation. Thus, given the Bretton Woods system, the oil/gold price was also nearly fixed. Throughout this entire period, through to the end of Bretton Woods in late 1971, 10–15 barrels of oil would buy an ounce of gold. As figure 1 indicates, the situation changed dramatically in the early 1970s.

In 1970, slightly more than 10 barrels of oil would purchase an ounce of gold.⁸ By the next year, when the Bretton Woods agreement ended, with gold priced at \$42 and oil fixed in terms of U.S. dollars at \$3.56, oil sellers needed nearly 12 barrels of oil to buy an ounce of gold. This “real” oil price decline, and general worldwide inflation did not go unnoticed in the oil-producing countries. In 1971, OPEC built in a 2.5 percent annual inflation factor by which to adjust the nominal (U.S. dollar) price

7. See Farah, 2002. A recently televised (in the Middle East) charity telethon in Saudi Arabia—complete with phone banks manned by volunteers—featured ever-rising mounds of gold in various forms (for example, jewelry and chains) as donations came in.

8. Between January 1970 and December 1979, 13.5 barrels of oil exchanged for one ounce of gold, on average. The minimum was 7.91 barrels per ounce in mid-1976, and the maximum was 34 barrels per ounce in mid-1973. Most often (that is, plus or minus one standard deviation of the mean), the range was from 9.25 to 17.7 barrels per ounce.



of oil.⁹ Yet, by mid-1973, nearly 34 barrels of oil were required to buy an ounce of gold. In little more than two years, the gold price of oil had fallen by more than 70 percent, and the oil price of gold had risen by almost 200 percent.

In response to the more rapid than expected fall in the value of the dollar after August 15, 1971, the Teheran Agreement of 1971 was amended in January 1972. The new agreement called for an 8.49 percent increase in the posted price of oil, “which corresponded to the rise [of 8.57 percent] in the price of gold vis-à-vis the US dollar” (Ahrari 1986, 62; see also Seymour 1981, 96). At that same meeting, it was decided that “in future, postings were to be adjusted upwards or downwards on a quarterly basis in line with an index based on the movement of the currencies of nine major industrialized countries (Britain, France, West Germany, Italy, Japan, Belgium, Holland, Sweden and Switzerland) vis-à-vis the US dollar” (Ahrari 1986, 62; see also Seymour 1981, 96). This automatic indexing was “abandoned altogether in the aftermath of the October 1973 price upheaval and has never been revived since” (Ahrari

9. This change came out of the Teheran Agreement of 1971 (Skeet 1988, 85). Almost from its founding in 1960, OPEC was concerned about maintaining the purchasing power of oil. At the fourth conference held in Geneva in 1962, “Resolution IV.32 . . . asked the Secretary General to prepare a comprehensive study for the formulation of a rational price structure . . . and specified that ‘an important element to the price structure to be devised will be the linking of crude-oil prices to an index of prices of goods which the Member Countries need to import?’” (Skeet 1988, 27). No index was agreed on in the 1960s, though the topic was raised from time to time. It also resurfaced from the mid-1970s to the late 1970s. El-Beblawi (1980) resumed the call for a basket of currencies to serve as a numeraire primarily because actions OPEC might take that would harm the dollar would also lower the value of their members’ stock of dollar-denominated assets.

1986, 87).¹⁰ After two years of the floating dollar, OPEC was acutely aware of the diminishing value of oil in terms of gold. In the words of the Kuwaiti oil minister in 1973, “What is the point of producing more oil and selling it for an unguaranteed paper currency?” (qtd. in James 1996, 253).¹¹

On January 1, 1974, OPEC raised the U.S. dollar price of oil from \$4.31 to \$10.11, producing the first dramatic price shock. After this increase, the “gold price” of oil (at 12.8 barrels per ounce of gold) was back within its historical range. For the rest of the decade, including the second dramatic price rise in 1979, the gold price of oil stayed within its historical range. At the end of the decade, 14 barrels of oil exchanged for an ounce of gold, well within its historical range but with a “real” price approximately 25 percent lower than at the beginning of the decade.

From OPEC’s perspective, its members had moved from a situation in which for decades the price of their primary export product had been stable in terms of currencies and gold to one in which relative values were changing dramatically. Because the price of that product was fixed in terms of one currency, the U.S. dollar, which was inflating rapidly, the “real” value of their oil had fallen just as rapidly. By making the nominal price changes they did in the 1971–73 period and especially in 1974, oil producers brought the real price of oil back to historical levels as measured relative to gold. As figure 1 indicates, relative stability continued throughout the rest of the decade.

A second way to look at the same data is to chart the individual price movements of gold and oil on the same graph, as shown in figure 2. In this figure, the ratio of two *y* axis values is fixed at ten to one, which means that any time the two data lines cross, 10 barrels of oil exchange for one ounce of gold. As the figure indicates, oil prices continually played “catch up” with gold prices throughout the decade.¹²

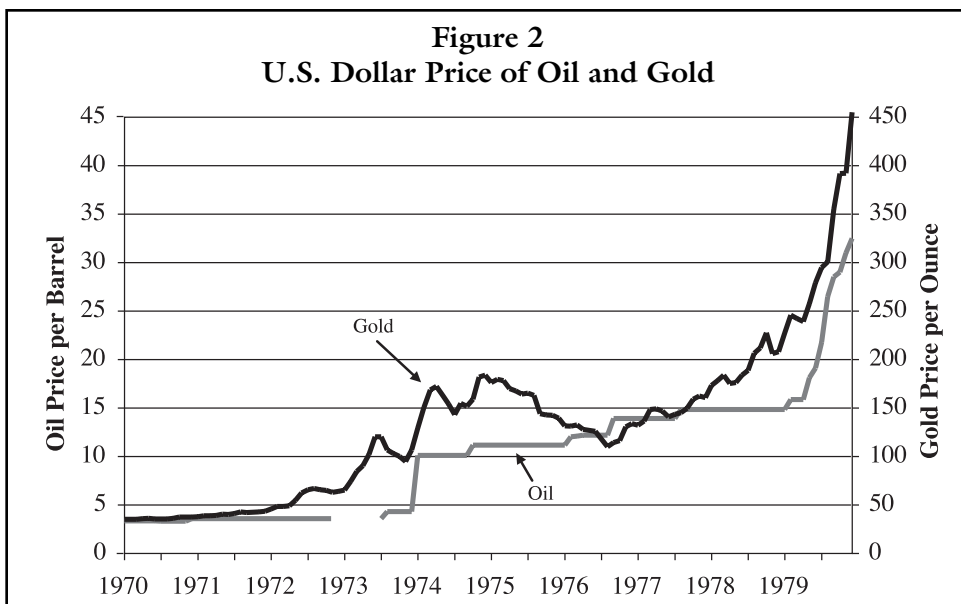
Causality

We focus on gold not as an argument that OPEC simply followed the price of gold to set its price or that political explanations are unimportant, but to make the point that the arbitrary choice of the unit of account can change the results of the analysis dramatically. Our argument is simply that any analysis of OPEC behavior must include the changing international institutions and cannot focus solely on the situation as seen

10. This abandonment of automatic indexing persisted despite suggestions through the 1970s that various indexes be used to adjust the price of oil (Ahrari 1986, 87; Skeet 1988, 131).

11. Prior to August 15, 1971, the “guarantee” had been that \$35 could be exchanged for one ounce of gold.

12. Statistically, in the period from January 1970 to the end of 1973, the correlation coefficient between monthly oil and gold prices was 0.678. In the period from January 1974 to the end of 1979, when the dollar price of gold fluctuated dramatically, the correlation coefficient was 0.891. These data are consistent with oil prices that moved more closely, both in proportion and in time, with changes in gold prices after 1973 than they had previously.



from a U.S. buyer's perspective. In light of our alternative depiction of the situation, we question the typical explanations of events in the 1970s.¹³

Consider how the topic is typically discussed today in economics classes throughout the country. Olivier Blanchard provides a typical introduction:

In the 1970s, the price of oil increased dramatically. This large increase was the result of the formation of the Organization of Petroleum Exporting Countries (OPEC), a cartel of oil producers. Behaving as a monopolist, OPEC reduced the supply of oil and in doing so, increased its price. . . . The relative price of petroleum, which had remained roughly constant throughout the 1960s, almost tripled between 1970 and 1982. There were two particularly sharp increases in the price, the first in 1973–1975 and the second in 1979–1981. (2003, 152)

The analysis usually concludes that these oil-price shocks resulted in “a combination of a recession and large increases in the price level” (Blanchard 2003, 155). Usually left out of the analysis is any discussion of why the OPEC cartel, originally formed in 1960, suddenly and dramatically increased prices. If authors do consider this matter, they usually blame the price rise, at least in late 1973, on the October War of that year, when the Arab members of OPEC cut production and embargoed oil shipments to the Netherlands and the United States in retaliation for those countries' support of Israel.

13. Claims that the large increases in oil prices were a political move by the OPEC countries continue to be repeated. See, for example, Cassidy 2003, 70.

In espousing this interpretation, Blanchard is scarcely alone among the authors of macroeconomic textbooks. A brief survey shows that several of the most widely used intermediate texts treat these topics similarly. Dornbusch and Fischer treat the breakdown of Bretton Woods briefly and analyze the oil-price shocks of the 1970s from the importing country's (that is, the U.S.) perspective, but they do not connect the two events (1994, 625, 632, 230–34). Froyen quickly recounts the breakdown of Bretton Woods, shows the nominal price of oil in U.S. dollars from 1965 to 2000, and analyzes the price shocks as negative aggregate-supply shocks in the United States (2002, 322–23, 207–11). Mankiw shows how rising oil prices in the 1970s and falling oil prices in the 1980s can be represented by aggregate-supply shifts and mentions Bretton Woods briefly, but he does not cover its breakdown (2003, 170, 363).

Intermediate macroeconomics texts are not alone in treating the oil-price shocks and the breakdown of Bretton Woods as unrelated events. A survey of international trade and finance texts yields the same results, although these books generally have more information on the Bretton Woods Agreement, as one would expect. Krugman and Obstfeld explain both events but treat them as unrelated (2000, 577–79, 557–60). They interpret the oil-price shocks of the early 1970s as resulting from the embargo of oil to the Netherlands and the United States by Arab members of OPEC. Carbaugh treats both events separately and briefly (2000, 246, 494). Salvatore's treatment is typical, with price shocks discussed in the context of aggregate-supply shocks, and OPEC and the breakdown of Bretton Woods discussed independently (1998, 263, 634). Neither of our surveys is meant to be exhaustive, but we have been unable to find either an intermediate undergraduate-level macroeconomics text or an undergraduate international trade and finance text that either ties Bretton Woods and the oil-price shocks together or considers the market from the sellers' perspective. One upshot is that this standard textbook view is reflected even today in the popular media (see, for example, Cassidy 2003).

Conclusion

The conventional wisdom is that for political reasons, OPEC punished the United States in January 1974 by embargoing oil shipments, thus raising the price of crude oil dramatically on world markets.¹⁴ This action, the story continues, led to negative supply shocks, inflation, and rising unemployment in oil-buying countries.

As neat and as popular as this explanation may be, it neglects the simple facts that, first, the Bretton Woods system ended in late 1971, resulting in foreign-exchange

14. This was not the first attempt to use oil as a political weapon. In 1967, the OPEC countries responded to the June 1967 war by embargoing the supply of oil to the United States and the United Kingdom. At that time, U.S. dependence on Arab oil was slight (3 percent of domestic consumption), and, more important, "Arab states had no means of controlling the eventual destination of their oil" (Terzian 1985, 107). King Faisal of Saudi Arabia did not want to use oil as a weapon: "Why should Faisal go to help Nasser when Egypt's expeditionary corps was still at the gates of his Kingdom, in Yemen?" (Terzian 1985, 107). By 1973, Nasser was dead, Faisal and Sadat of Egypt were friendlier, and the United States ignored several warnings from Faisal before Saudi Arabia finally agreed to the embargo (Terzian 1985, 165).

markets that were suddenly much less stable than they had been over the previous three decades; and that, second, as a result, in order to maintain purchasing power, the OPEC countries were raising the prices of crude oil prior to the political events that culminated in October 1973.

Our argument is simply that the cartel model of monopoly rent seeking is incomplete given the changing institutional environment in which OPEC countries found themselves after August 1971. Viewed from the oil producers' viewpoint, the breakdown of Bretton Woods severed the tight link from U.S. dollars to other currencies or quantities of commodities. Rather than raising the relative price of oil, OPEC countries were only "staying even" by dramatically raising the dollar price of oil.

Perhaps the relative importance of the political influences versus the economic influences can never be known, but both were important. To date, discussions have focused only on the political cause. We doubt that the political cause can support the weight of successfully explaining the time path of oil prices through the early 1970s that took place well before the outbreak of hostilities in October 1973. From 1971 onward, the OPEC countries repeatedly met to adjust prices in response to the dollar's loss of purchasing power that resulted from the ending of the Bretton Woods Agreement. As economists, we find this economic cause more compelling in explaining oil price shocks, and we find the view from the producer's perspective to be more informative as well.¹⁵

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15. Some argue that a possible third factor, such as the political instability in the world in the early 1970s, caused the price of gold to rise and hence caused the price of oil to rise. However, this explanation does not explain the long-standing interest among oil-producing countries in maintaining the real purchasing power of their oil, nor does it explain the upward adjustment of oil prices by ever larger amounts in 1971 and 1972, as the dollar, post-Bretton Woods but prior to the October War, continued to lose value against other currencies and commodities, such as gold. Finally, some (such as Bernstein 2000, 354–55) argue that the rising price of oil (in 1973–74 and again in 1979) caused the price of gold to rise. This interpretation flies in the face of the evidence that shows gold prices most often leading oil prices.

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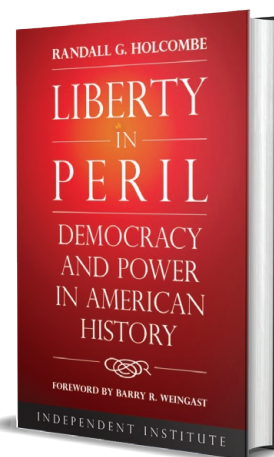
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