Readings

Whom The Gods Would Destroy

Adjusting to Volatile Energy Prices
by Philip K. Verleger, Jr.
(Institute for International Economics, 1994), 262 pp.

Reviewed by Jim Johnston

In 1975 the renowned international trade economist and monetary theorist Harry Johnson paraphrased Euripides thus:

> Whom the gods would destroy they first endow with a central bank. Then to insure that the destruction will be complete, they encourage the bankers to meet in international forums and coordinate their mistakes.

One could easily substitute energy ministries for central banks and the result would be the same. This is not for lack of trying. The list of books and articles dealing with the international aspects of energy policy probably outstrips sex manuals, without being nearly as interesting. Hope seems to spring eternal on the part of international energy analysts like Philip Verleger that the energy diplomats will finally get it right.

Verleger's book is yet another try at a grand agreement on energy issues between the governments of oil-exporting countries and oil-consuming countries. This time there are new ingredients in the discussion. They are the global warming connection and the energy "derivative" contracts, including exchange traded futures and options, and over-the-counter swap contracts. Verleger provides a useful survey of these instruments and how they can be used in hedging price risk for oil producers and consumers. But the big payoff for Verleger goes far beyond the hedging of risk. According to him, an agreement on four major items between consuming and producing governments can substantially reduce the volatility of energy prices.

The four proposed elements of a successful agreement are:

- utilize oil and financial futures and options to achieve price stability;
- get governments to respect the sanctity of contracts;
- remove the barriers to international trade and investment; and
- impose a carbon tax to reduce the supposed threat of global warming.

Yet, the latter two components are of dubious value because they are based on flawed premises. In the case of global warming, Patrick Michaels has shown that the threat is small. Moreover, the official organization charged with coordinating the issue has mellowed in its attitude. In 1988 the Intergovernmental Panel on Climate Change was established and in a 1990 report, it predicted a possible increase in average temperatures of from one to five degrees Celsius. Two years later that same IPCC reported that over the last century global mean temperatures have risen only 0.3 to 0.6 degrees Celsius.

The Verleger proposal does not simply suggest a carbon tax. It involves a change in marginal rates for all forms of energy worldwide and a shifting of the tax revenues from consuming countries to producing countries. My own experience in the early 1970s as the U.S. Treasury representative at the U.N. Conference on the Law of the Sea suggest that the Verleger tax scheme is even more complex and therefore even less likely to come into force. Further, Verleger does not have a very good record in tax analysis. He asserted in 1980 that a Windfall Profits Tax would result in a huge increase in the domestic production of crude oil. Of course, it

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could not and did not happen.

Commodity Cartels

Virtually no economist advocates barriers to international energy trade. In that sense, Verleger is conventional in his policy preferences. However, if it were easy to reduce trade restrictions, it would have been done long ago.

What the international politicians have tried to do instead is fashion international commodity cartels. The model of choice has been the coffee cartel in the 1960s. Wanting to push up the export earnings of some developing countries, the Kennedy Administration agreed to act as enforcement agent for the coffee producers. The arrangement worked like this. Each producing country would receive stamps equal to its assigned quota. The stamps would then be attached to the bags shipped to the United States. Bags without stamps would simply be returned to the shipper. Thus, no producing country could cheat on its quota by surreptitiously shaving prices and increasing output. This enforcement system worked because the United States was the major coffee consuming country in the world. It stopped working when the U.S. customs agents halted the policing of the cartel quotas at the ports of entry.

The latest example of this kind of effort is the emerging aluminum cartel. The U.S. government participation, according to the *Wall Street Journal* on June 9, 1994, is motivated by a desire to increase the price received from Russian exports of aluminum.

It is clear from the record that the "price stability" that is being sought is through an efficiently operating commodity cartel. In this regard, the participation of the United States and other major consuming country governments is a necessary condition. Needless to say, this type of stability is not in the interests of consumers themselves. Moreover, cartels seldom reduce volatility because the frantic grasping for monopoly rents creates opportunistic behavior that is difficult to detect and remedy.

Dealing with Uncertainty

As for reducing complexity, the trend in the United States appears to be going in the direction of more rather than less. For example, uncertainty around the gasoline specifications with respect to Reid vapor pressure has reduced the number of contracts offered by the New York Mercantile Exchange (NYMEX). When governments deliberate, as opposed to reaching agreement, uncertainty rises and this in turn inhibits the functioning of markets. Ordinarily, markets thrive on uncertainty. But they do not when the uncertainty has to do with the rules of the game.

The peculiar schedule of NYMEX oil derivative introduction is instructive in this regard. Heating oil futures were first used in 1978, followed closely by leaded gasoline. This coincided with the elimination of price controls in the same year. It was not until crude oil prices were decontrolled in 1981 before the crude oil contracts were introduced. Similarly, natural gas futures contracts were not introduced until 1990 when access to pipelines were opened by the Federal Energy Regulatory Commission.

Markets are powerful tools which play an important role in protecting consumers and producers. However, they cannot be expected to indemnify individuals against the actions of government. It is ironic; markets handle acts of God with grace, but acts of governments are confounding. Albert Einstein once asserted that God is not malicious. It is not clear that the same claim can be made for government.

The existence of the Strategic Petroleum Reserve (SPR) in the United Sates and similar precautionary stockpiles elsewhere, are asserted to be effective antidotes to price instability. Joseph and the Pharaoh, with the help of divinely inspired crop forecast, effectively used stockpiling to save Egypt during a famine. However, they had a highly reliable forecast, the likes of which has not been seen since.

Stockpile of Errors

Verleger correctly criticizes the misuse of the oil stocks by the Bush Administration at the beginning of the Gulf War. The Bush Administration promised the oil industry that the Strategic Petroleum Reserve would be used to stabilize prices in the event of a supply disruption. Yet after the war began, the White House declared that "there is no shortage." Compounding the problem, the Bush Administration was essentially turning a five million barrel per day supply reduction into a nine million barrel per day reduction. The American boycott of oil from

Iraq not only pushed up prices but it also sharply increased implied volatility as measured by the prices of crude oil options. The failure to release from the SPR was a huge mistake and it is to Verleger's credit that he cited the lack of action as sufficient justification for disbanding the U.S. Department of Energy on the grounds that it had failed in its basic mission.

But stockpile policy mistakes did not end there. At the end of the war when Saudi production was no longer in danger, the International Energy Agency (IEA) began releasing oil from the reserves. The attempt was to release two million barrels per day. However, only 600,000 barrels per day were accepted by the market during the month after the war's end. Not only did this put crude oil prices into a free fall, it also kept volatility needlessly high beyond the end of the crisis. Curiously, Verleger has been silent about this second stockpile screw-up.

Thus, the stockpile managers made two grotesque mistakes. They did not release at the beginning of the war when they should have. And they did release at the end of the war when they should not have. Could one imagine Joseph and the Pharaoh being remembered fondly for not releasing grain until the seven famine years were over?

Verleger suggests that for the producer-consumer dialog, the importance of precautionary oil stocks has declined. He cites the IEA conclusion that government stocks have displaced private stocks. It may well be that the payoff from private stockpiling has declined. It may also be true that the government stockpile debacle during the Gulf War has poisoned the environment for productive private stockpiling decisions. During an emergency there is a tendency to berate oil companies as war profiteers. By contrast, when the crisis is over and oil prices plunge, there are no congressional hearings or television investigations into the degree to which consumers price gouge oil companies.

Energy Futures

The most important part of the Verleger book deals with the new energy futures and options contracts. There is great potential for these derivative contracts, as they are called, to insure both consumers and producers against price risk. On this point Verleger is right on target. However, these contracts cannot reduce price volatility, a point that Verleger does not seem to appreciate. Buying fire insurance does not reduce the probability of a fire.

Verleger also confuses speculation with hedging. He cites "Mexico's purchase of over-the-counter puts to hedge its exposure to price fluctuations during 1991." It should be remembered that this occurred near the end of the crisis, not before the beginning of the crisis. What were the Mexicans doing before the war began? Apparently they did nothing during the time it was appropriate to hedge their price risk exposure. On the eve of the invasion of Iraq, the Mexicans authorities were betting that the prices would go down. But prices could have gone even higher if the Saudi fields off shore from Kuwait were damaged in the battle. No one knew at the time.

Moreover, the Mexicans must have paid very high premiums for the puts because the price uncertainty as measured by the implied volatility was at an historically high level, in excess of 100 percent on an annualized basis. A less costly speculation would have been to sell short the futures.

Another speculative strategy the Mexicans could have adopted was to sell covered calls. That is, be the insurers of terrified consumers, collecting in the process the very high options premiums that prevailed at the time. While prices exhibit a random walk, volatility is mean reverting. In other words, there was an equal chance that prices in the midst of a crisis could go lower or higher, but the expected volatility was bound to go lower because the market players learn to adjust to the new conditions, whatever they are.

The jet fuel market in the United States during the Gulf War was interesting in this regard. Before the Gulf War, only a few U.S. airlines hedged their jet fuel price risk using price-capped contracts with suppliers. When prices shot up with the invasion of Kuwait, those jet fuel suppliers lost the extraordinary gains that would have been earned without the price guarantee. However, during the crisis, the airlines learned the lesson, but too well. Many rushed into jet fuel price guarantees and paid the very high options premiums. The jet fuel suppliers who sold these contracts (essentially writing covered calls) were able to recoup the foregone gains from the earlier guarantees.

The jet fuel market in Europe was quite dif-

ferent. Elf Aquitaine sold over-the-counter contracts for jet fuel. Most of the larger European airlines took advantage of these derivatives and hedged their jet fuel price risk before the Gulf War. These European airlines were therefore well protected during the Gulf war and were able to resist the temptation to over-hedge after the price shock began.

There were two major outcomes from the European experience. One was that Elf went out of the business of insuring jet fuel price risk. The other result was that the European airlines emerged from the Gulf war sufficiently well positioned to buy equity interests in weakened U.S. airlines.

These anecdotes underscore that hedging is complex and should not be undertaken without extensive study of the derivative contracts and the physical hedging alternatives. The recent difficulties at Procter & Gamble, Gibson Greeting, Dell Computer, Lloyd's of London, Showa Shell, ARCO's employees savings plan, and Metallgesellschaft all suggest caution in dealing with derivatives.

The Metallgesellschaft-case is especially relevant for the present discussion because it involved risk in its refinery operations. The problem arose because Metallgesellschaft offered its customers fixed priced delivery contracts for periods as long as ten years, and hedged by taking opposite positions in the short term delivery contracts. The company assumed that the typical backwardation condition would continue in the oil markets. That is, the spot price would remain higher than the price of the farther out futures contracts. However, since spot and near term contracts are more volatile than long term contracts (because supply and demand elasticities are lower in the short term), the backwardation could and did change into the opposite condition, called contango. At that point Metallgesellschaft had a serious problem rolling over its hedge each month, losing as much as $30 million every time, according to former SEC Chairman Richard Breeden.

When reading Verleger you get the impression that derivative contracts and perhaps precautionary stocks are the only ways to hedge energy price risks. Yet, there are many other ways. The most obvious is the fixed price contract between an energy producer and consumer. At one time, most natural gas was sold under long term contracts. However, reneging on take or pay contracts by pipelines poisoned the environment. It may well be that the demise of long term gas contracts stimulated the emergence of gas futures and options because these derivative contracts have extra enforcement arrangements like daily mark to market settlements.

Forms of Flexibility

Another way to hedge market risk, is to build physical flexibility into the operations. For example, refinery investment over and above simple distillation permits successful operation in a wider range of market conditions.

Vertical integration is another example. Refiners with an upstream production affiliate, have a kind of assured supply with price guarantees for a defined time period. The producing subsidiary is a ready supplier, especially in difficult market conditions, compared with nonaffiliated producers. As such, it is reasonable for the internal transfer price to reflect the options premium. Moreover, vertical integration reduces the problem of contract reneging.

These are powerful considerations. Indeed, physical hedges are generally superior to derivative contracts. This is inferred by the work of Robert Weiner. He has identified no fewer than 12 crude oil futures markets in the United States before 1900. What is noteworthy, is that they all disappeared when the industry became vertically integrated.

This is not to say that derivative contracts have no redeeming virtues. They do and they are important. One of the most meaningful characteristics is the interaction with investment decisions. There are two basic scenarios for this interaction. One is the temporary shock that comes and then goes, returning conditions to the state they were in before. The Gulf War is an example, especially for consumers. The proceeds of a properly designed hedge provided energy consumers with the wherewithal to purchase supplies from the spot market in order to continue operations during the war. Of course, the hedged consumer also has the option of shutting down operations and pocketing the proceeds of the hedge. That is a socially useful move since it frees up the physical commodity to go to other more highly valued uses.

The other types of crisis is one where the change in market conditions is permanent. In

this case the proceeds of the hedge can be used to finance capital reformation to better serve the new market conditions. Alternatively, it could finance the acquisition of assets better suited to the new circumstances as was done by the European airlines.

There is another role that market institutions play. As mentioned earlier, government regulation tends to displace market institutions. The converse is also true. Markets can be substitutes for government regulation. Martin Feldstein has suggested that foreign exchange and interest rate markets protect international businesses better than the proposed European Monetary System. In the energy area, futures and options can protect natural gas consumers more effectively than rate regulation with an automatic fuel adjustment clause.

In the international arena, there is every reason to believe that the increased use of derivatives can replace much if not all of the potential agreements between consumer and producer governments. During the Gulf War oil derivatives performed beautifully while the stockpile policies of the International Energy Agency failed miserably.

Conclusion

The Verleger book misses virtually all of these points. He lacks a clear understanding of the difference between hedging and speculation. He fails to discuss the considerable potential for the misuse of derivatives. He seems unacquainted with the real role of derivatives in interacting with investment decisions. He suggests increased taxation as a "solution" to the yet-to-be-demonstrated problem of global warming. He puts great faith in a producer-consumer dialog to achieve stability in prices, despite the fact that such negotiations have a checkered history of attempted cartel creation. Thus, the Verleger book is not very useful for understanding hedging or for crafting an effective international energy policy. In short, it invites the gods to destroy us.